URBAN DISASTER RISK MANAGEMENT WITH COMPULSORY EARTHQUAKE INSURANCE IN TURKEY

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

ARZU TAYLAN

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
CITY AND REGIONAL PLANNING

SEPTEMBER 2009

Approval of the Thesis:

URBAN DISASTER RISK MANAGEMENT WITH COMPULSORY EARTHQUAKE INSURANCE IN TURKEY

submitted by ARZU TAYLAN in partial fulfillment of the requirements for the degree of Doctor of Philosophy in City and Regional Planning Department, Middle East Technical University by,

Prof. Dr. Canan Özgen
Dean, Graduate School of Natural and Applied Sciences _____

Prof. Dr. Melih Ersoy
Head of Department, City and Regional Planning _____

Prof. Dr. Murat Balamir
Supervisor, City and Regional Planning Dept., METU _____

Prof. Dr. Ute Werner
Co-Supervisor, Institute of Finance, Banking, and Insurance, Karlsruhe Institute of Technology, Germany _____

Examining Committee Members:

Prof. Dr. Melih Ersoy
City and Regional Planning Dept., METU _____

Prof. Dr. Murat Balamir
City and Regional Planning Dept., METU _____

Prof. Dr. Ruşen Keleş
Political Sciences Department, Ankara University _____

Prof. Dr. Mehmet Ecevit
Sociology Department, METU _____

Assoc. Prof. Dr. Çağatay Keskinok
City and Regional Planning Dept., METU _____

Date: 25.09.2009

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name : Arzu Taylan

Signature :

ABSTRACT

URBAN DISASTER RISK MANAGEMENT WITH COMPULSORY EARTHQUAKE INSURANCE IN TURKEY

Taylan, Arzu
Ph.D., Department of City and Regional Planning
Supervisor : Prof. Dr. Murat Balamir
Co-Supervisor: Prof. Dr. Ute Werner

September 2009, 431 pages

Turkish Compulsory Earthquake Insurance (ZDS) introduced after the 1999 Earthquakes aimed to lower financial burdens of the State and to promote safer building construction. High earthquake risk in Turkey necessitates risk mitigation, in line with the priority of the new international policy. Yet, the ZDS system operates without regard to risk mitigation, and it is far from being a compulsory condition.

The ZDS system has low penetration ratios due to expectations of State-aid in the event of a disaster, which arise from perceived attributes of ZDS, according to the findings of the Zeytinburnu household survey. The ZDS system generates social inequalities because purchase of the ZDS contracts is voluntary. This is related to higher social statuses and general insurance purchase behavior, whereas insured homeowners in middle-lower income levels are observed to differ significantly from un-insured homeowners in their perception of the ZDS purchase as 'compulsory' and as a form of 'social solidarity'. Operation of the ZDS disregarding risk mitigation seems to promote fatalistic attitudes and

reluctance to conform with requirements of risk mitigation. Low penetration ratio and high earthquake risk threaten efficiency of the ZDS system and does not reduce burdens of the State.

Based on survey findings, a more appropriate strategy for the achievement of resilience against earthquakes could be possible through the collaboration of the ZDS system with local administrations. It is observed that by means of a 'Grant Program', there may be abundant reason and evidence to achieve convertion of the ZDS system from a post-disaster loss compensation mechanism to a pre-disaster risk reduction benefactor.

Supporting municipalities to produce urban risk maps could reduce risks by more accurate estimation of potential losses, and an extended coverage of the ZDS system to urban risks. Relationship analyses between homeowners' attributes, perceptions and tendencies toward alternative policies indicate the necessity of introducing policies based risk-rated premiums. Homeowners are observed as requiring technical and financial assistance to take mitigation measures, decisions under individualized conditions, on the other hand, seem to reinforce fatalistic attitudes and reluctance due to the disregard of risk mitigation benefits and ZDS purchase.

Waste of public resources and creation of social inequalities could be prevented by enhancing the capacities of local authorities to implement urban risk mitigation plans and community-based projects via a Grant Program. 'Relationship analyses' of the attitudes of homeowners for alternative policies with respect to their attributes and perceptions revealed that a Grant Program could result in the perception of the ZDS system as a form of social solidarity in risk mitigation. This is to reduce fatalistic attitudes, and curb reluctance compared to individualized conditions of insurance purchase. As a result, willingness to mitigate risks through active participation and purchase of ZDS contracts, particularly among homeowners in the middle-lower socio-economic statuses are likely to expand leading to a resilience society.

Keywords: natural hazard insurance, urban risk mitigation, natural disaster risk management, household's decision process under uncertainty, social resilience and solidarity against natural disasters, local authorities

ÖZ

ZORUNLU DEPREM SİGORTASI İLE TÜRKİYE'DE KENTSEL RİSK YÖNETİMİ

Taylan, Arzu
Doktora, Şehir ve Bölge Planlama Bölümü
Tez Yöneticisi : Prof. Dr. Murat Balamir
Ortak Tez Yôneticisi: Prof. Dr. Ute Werner

September 2009, 431 sayfa

1999 Depremleri'nden sonra oluşturulan Zorunlu Deprem Sigortası (ZDS) devletin finansal yükünü azaltmayı ve binaların sağlamlaştırılmasını teşvik etmeyi amaçlamıştır. Türkiye'deki deprem riskinin yüksek olması, risk azaltmayı gerektirmekte; bu ise, risk azaltmanın uluslararası yeni politikadaki önceliği ile bağdaşmaktadır. Ancak, ZDS sistemi, risk azaltmayı göz önüne almadan ve zorunlu koşullarda uygulanmaktan oldukça uzak olarak idare edilmektedir.

Zeytinburnu hanehalkı araştırması bulgularına göre, ZDS sistemi'nin algılanan özellikleri bir afet olayında Devlet yardımı beklentisine neden olduğu için, ZDS sistemi düşük sigortalanma oranlarına sahiptir. ZDS'nin gönüllü olarak yaptırılması nedeniyle, ZDS sistemi sosyal eşitsizlikler yaratmaktadır. Bu, yüksek sosyal statüler ve genel sigorta yaptırma davranışı ile ilgili iken, orta-düşük gelir düzeyindeki konut sahiplerinin, ZDS yaptırmayı 'zorunlu' ve bir 'sosyal dayanışma' biçimi olarak algılamasının, sigortasız konut sahiplerinden önemli farklılık gösterdiği gözlenmektedir. ZDS'nin risk azaltmayı gözardı ederek yönetilmesinin kaderci tutumlara ve risk azaltmanın gerektirdiği koşulları yerine getirmek için güçlü bir isteksizliğe neden olduğu görülmektedir. Düşük sigortalanma oranı ve

yüksek deprem riski, ZDS sistemi'nin verimli çalışmasını tehdit etmekte ve devletin depremlerden sonraki yükünü azaltmamaktadır.

Araştırma bulgularına göre, depremlere karşı dirençlilik oluşturmak için daha uygun bir strateji, ZDS sistemi'nin yerel yönetimlerle işbirliği ile olası görünmektedir. ZDS sistemi'nin, bir 'Teşvik Programı' oluşturması sayesinde, afet sonrası kayıp teminatı mekanizmasından, afet öncesi risk azaltma destekleyicisine dönüşmesini başarmak için birçok neden ve kanıt olduğu gözlenmektedir.

Belediyeleri, kentsel risk haritaları üretmesi için desteklemek, potansiyel kayıpları salt doğru biçimde ölçerek riskleri azaltabilir; ve ZDS sistemi'nin kapsamını kentsel risklere genişletebilir. Konut sahiplerinin özellikleri, algıları ve alternatif politikalara eğilimleri arasındaki ilişkisel analizler, riske dayalı primlerin üretildiği politikaların uygulanmasının gerekli olduğunu göstermektedir. Konut sahiplerinin, risk azaltma önlemlerini almak için teknik ve finansal desteğe ihtiyaç duyduğu gözlenmekte; diğer yandan, risk azaltmanın faydaları ve ZDS yaptırmanın göz ardı edilmesi nedeniyle, bireyselleştirilmiş koşullardaki kararların kaderci tutumları ve isteksizliği güçlendirdiği görülmektedir.

Yerel yönetimlerin, kentsel risk azaltma planlarını ve yerel topluluk tabanlı projelerini uygulaması üzere kapasitelerinin güçlendirildiği bir Teşvik Programı, kamu kaynaklarının israfını ve sosyal eşitsizliklerin yaratılmasını önleyebilir. Hanehalklarının alternatif politikalara karşı tutumlarının, özellikleri ve algılarına göre irdelendiği 'ilişkisel analizler', bir Teşvik Programı sayesinde, ZDS sistemi'nin risk azaltmada bir sosyal dayanışma biçimi olarak algılanabileceğini ortaya çıkarmıştır. Bu, bireyselleştirilmiş kararlara kıyasla, kaderci tutumları azaltacak, ve isteksizliği sınırlandıracaktır. Sonuç olarak, aktif katılım ile risklerin azaltılmasına ve ZDS yaptırılmasına olan isteklilik, özellikle orta-düşük sosyo-ekonomik düzeylerdeki konut sahipleri arasında, dirençli bir toplum yaratılmasına neden olacak biçimde genişleyecektir.

Anahtar Kelimeler: doğal afet sigortası, kentsel risk azaltma, doğal afet risk yönetimi, belirsizlik altında hanehalkı karar verme süreci, doğal afetlere karşı toplumsal direnç ve sosyal dayanışma, yerel yönetimler

To my altruistic parents

Nebahat and Bekir Taylan

ACKNOWLEDGMENTS

I wish to express my deepest gratitude to my supervisor Prof. Dr. Murat Balamir for his guidance, advice, criticism, encouragements and insight throughout the research. I would also like to express my sincere appreciation to my co-supervisor Prof. Dr. Ute Werner for her suggestions and comments during the research. Special thanks to Prof. Dr. Murat Balamir and Prof. Dr. Ute Werner for their support in providing me to be granted for the DAAD Scholarship to continue my studies in Karlsruhe, Germany. I would like to express my thanks to the members of my doctoral steering committee, Prof. Dr. Melih Ersoy and Prof. Dr. Mehmet Ecevit for all valuable critics and contributions to the study. I also thank to my examining committee members, Prof. Dr. Ruşen Keleş and Assoc. Prof. Dr. Çağatay Keskinok for their significant evaluations. This study is dedicated to the memory of Prof. Dr. Raci Bademli, who recommended me, firstly, to study on the subject of this thesis, although he could not read it. I would like to thank to the directors and employees of DASK for their kind contribution by providing database and to the directors and employees of the Zeytinburnu Regeneration Office of Istanbul Metropolitan Municipality for their significant effort in carrying out the field survey in Zeytinburnu, Istanbul. I am very thankful to my colleagues and friends, especially, Yelda Kızıldağ Özdemir, Burcu Özdemir Sari, Meltem Şenol Balaban, Osman Balaban, A. Mert Burnaz, Dietmar Borst, Tina Plapp, Oya Erişen, Ahu Coşkun and Ceyda Özaydın for their special supports. I would like to express my special thanks to my aunts Sebahat Çarkgil and Melahat Anadolulu, my cousin Rümeysa Jane and my uncle Hidayet Özkaynak. I am very thankful for the specal support of my uncle Metin Çarkgil at the very beginning of my research, although he couldn't see the thesis. Last but not at least, I would like to express my special thanks to my parents Nebahat and Bekir Taylan for their encouragement, unfailing support and faith in me throughout this study and during all stages of my life. (This study was supported by the State Planning Organization (DPT) Grant No: BAP-09-11-DPT-2002K125/510.)

TABLE OF CONTENTS

LIST OF TABLES

TABLES

LIST OF FIGURES

FIGURES

LIST OF ABBREVIATIONS

ABBREVIATIONS

CEA:	California Earthquake Insurance Authority
CRS	Community Rating System
DASK:	Doğal Afet Sigortaları Kurumu (Natural Disaster Insurance Institution)
DEMD	Disaster and Emergency Management Directorate (Afet ve Acil Durum Yönetimi Başkanlığı)
DMA:	The Disaster Mitigation Act
DRR:	Disaster Risk Reduction
EAF:	East Anatolian Fault
ED:	The Earthquake Department
EMPI:	Earthquake Master Plan of Istanbul
EPMs:	Emergency Preparedness Measures
FEMA:	Federal Emergency Management Agency
GD-TRU:	The General Directorate of Technical Research and Implementation Unit
Hhs:	Households
Hh-Heads:	Household Heads
HILCs:	High Income Level Countries
HMGP.	The Hazard Mitigation Grant Program
IDNDR:	International Decade for Disaster Reduction
IMM:	Istanbul Metropolitan Municipality
ISDR:	International Strategy for Natural Disaster Reduction
ISMEP:	Istanbul Seismic Risk Mitigation and Emergence Preparedness Project
MEER	Marmara Earthquake Emergency Reconstruction Project
MLICs:	Medium-Low Income Level Countries
MPWS	Ministry of Public Works and Settlements
NAF	North Anatolian Fault
NDRM	Natural Disaster Risk Management
NFIP:	National Flood Insurance Program

NRMC:	National Risk Mitigation Commission
PMD:	The Planning and Mitigation Department
RMF:	Risk Mitigation Fund
RMMs:	Risk Mitigation Measures
TCIP:	Turkish Catastrophe Insurance Pool
TOKI	Toplu Konut İdaresi (Housing Development Administration in Turkey)
TÜIK	Türkiye Istatistik Kurumu (Statistical Institute of Turkey)
UN:	United Nations
USA:	United States of America
ZDS:	Zorunlu Deprem Sigortası (Compulsory Earthquake Insurance)

CHAPTER 1

INTRODUCTION: NATURAL HAZARD INSURANCE AS THE SUBJECT OF STUDY

Compulsory Earthquake Insurance (This is 'Zorunlu Deprem Sigortası', abbreviated here as ZDS) constitutes a compulsory national hazard insurance system in Turkey, established as a public-private partnership. It is often argued that the introduction of the ZDS system has been a noteworthy transformation in disaster policy of Turkey, representing a shift toward pre-disaster risk management and mitigation. Turkish disaster policy has long emphasised post-disaster activities as elaborated in the Disasters Law (No. 7269). However, this conventional model discouraged pre-disaster risk mitigation both at administrative and household levels. Indeed, limits of post-disaster emphasis and the sole responsibility of the State is understood as loss compensation. This understanding has been subject to critical views after immense physical destruction and grave socio-economic impacts of 1999 Kocaeli and Düzce Earthquakes that slowed down the country's development. As a part of Marmara Earthquake Emergency Reconstruction (MEER) Project of the World Bank, the ZDS system has been put in effect (World Bank 2000). Through the ZDS Decree of the Board of Ministers (No. 587; 27.12.1999) [Appendix A], the State aimed to stop wasting public resources to compensate earthquake losses in urban areas in terms of direct housing provision or credits (Article 11 in the ZDS Decree). This task has been transferred to the ZDS system targeting owners of authorized residential dwellings in urban areas (Article 2 in the ZDS Decree).

According to the ZDS Decree, lowering the financial burden of homeowners and of the State after earthquakes was not the sole aim of the ZDS system. "Contribution to safer building construction and risk mitigation" was stated as another essential aim in reducing future losses of earthquakes as: "d) Increasing the quality of building standards through pricing ZDS premiums in terms of detailed risk modelling that considers soil conditions and building attributes; e) using insurance system as a tool in production of safer buildings; and f) supporting studies involved with risk mitigation methods and applications" (General Reasons of the ZDS Decree). In addition, the factors in the determination of ZDS premiums are explained as the size of the building, the class and quality of construction,

geological attributes of the land, on which building is constructed, earthquake risk and similar factors (Article 10 in the ZDS Decree).

In fact, with these aims and attributes, the ZDS system cannot be separated from other legal and institutional changes toward risk mitigation at that time. Particularly, Decree on Construction Supervision (later Law No. 4708) and Decree on Proficiency in Constructional Professions (No. 601) were enacted in succession, and constitute other parts of the disaster policy transformation in Turkey toward safer building construction practices.

In this context, the ZDS system began to operate for risk mitigation and financing purposes in terms of an insurance pool that is known as the Turkish Catastrophe Insurance Pool (TCIP), which is governed by a seperate state-owned legal entity, the "Natural Disaster Insurance Institution" (in Turkish "Doğal Afet Sigortaları Kurumu", abbreviated as DASK). A private insurance or reinsurance company is contracted out to perform the administration of DASK, as ZDS contracts are sold through authorized insurance companies and agents in Turkey. Operations of DASK are audited by the Under-secretariat of the Treasury of Turkey that constitutes the public side of this partnership. A Board of Directors manages the overall ZDS system (Article 4, 6, 7 and 8 in the ZDS Decree). ZDS system transfers its financial risk through purchasing reinsurance from global financial markets in terms of insurance techniques. In the case of excessive losses, eathquake losses are to be compensated in proportion to total resources in TCIP and its reserves. The people eligible to purchase ZDS contracts are determined by DASK through utilizing from the records of provinces and municipalities, and registry of title-deeds (Article 12 in the ZDS Decree).

In spite of its initial objectives, the current ZDS system is precarious, whether it could 'contribute to risk mitigation'. First of all, the ZDS Decree has not acquired the status of a law, even though a Draft Law prepared almost ten years ago. However, the techniques implemented in the current ZDS system do not provide linking it to safer construction practices and risk mitigation. The ZDS Tariff has been determined according to the country scale earthquake hazard map since 2000. However, this Tariff does not give accurate information on geological conditions in urban areas and do not regard differential earthquake vulnerability of buildings as well as other urban risks that are involved with reference to use of buildings [General Conditions of DASK in Appendix A and the Tariff of the ZDS system in Appendix A]. Therefore, ZDS system cannot offer risk-rated premiums that can encourage risk mitigation through contractual methods at the household level. In the same way, this system of ZDS do not provide technical and financial contribution to risk mitigation at the local

administrative level. Hence, the ZDS system is simply a compensation mechanism for the survivors after the disaster apart from risk mitigation.

However, earthquake risk mitigation in Turkey has priority than risk transfer because of high earthquake vulnerabilities and risks in the country. Urban areas are highly exposed to earthquake hazards because of proximities to active earthquake faults. The building stock is highly vulnerable to earthquakes since most of the stock lacks proper engineering services. The underlying reason of this vulnerability in urban built environments can be particularly attributed to deficiencies in urban planning and building construction systems during rapid and uncontrolled urbanization since 1960s. On one hand, urban plans rarely include sufficient earthquake safety elements (as witnessed by the Development Law No: 3194).

On the other hand, local authorities are limited in their technical, financial capacities and face and political problems in meeting the needs of rapid population growth in cities. Under these conditions, built environment could not be produced with necessary safety standards. Authorized housing stock is constructed with little control and deficient codes against earthquakes. Self-constructed un-authorized houses are another source of vulnerabilities. If eathquake risk in Turkey is not mitigated, the country may confront immense destruction in urban areas that can cause serious socio-economic impacts and loss of lives, as experienced in the 1999 Earthquakes. Agglomeration of population in urban areas aggravates this threat, especially in metropolitan cities in first degree earthquake hazard zones such as Istanbul and Izmir.

The emerging international policy, on the other hand, gives also top priority to disaster risk reduction (DRR) since 1990s. Confronting catastrophic losses, the world society recognizes that conventional post-disaster management becomes insufficient. Instead, a new natural disaster policy that emphasises pre-disaster risk reduction reigns in the international arena. This policy shift can be observed in several conferences and declarations of the United Nations (1990-2000: United Nations (UN) – IDNDR-; 1994 Yokohoma Conference, establishment of ISDR in 2000 as a new organ of UN; 2005 Hyogo Conference, and 2005-2015 Hyogo Framework for Action). This new policy recommends a comprehensive natural disaster risk management framework through integration of disaster risk reduction into sustainable development to build-up resilience against hazards at all national, local community and individual levels.

This policy gives greater priority to urban planning for transformation of societies from vulnerability to resilience by setting urban planning at the center of environmental, social and economic spheres for a

sustainable natural disaster risk reduction. In this framework, integration of hazard mitigation into urban planning, enhancing community capacities and monitoring these plans are urgent issues. In addition, all stakeholders in the society are described as proactive agents of risk mitigation through a bottom-up participation. Moreover, sustainable financial resources are to be used not only for post-disaster activities, but particularly for pre-disaster risk mitigation activities (UN/ISDR 2004; UNDP 2004; UN/ISDR 2009). In other words, transformation from a fatalist and vulnerable society into a resilient society is not to be limited with the compensation of disaster losses, but requires the direction of investments into risk mitigation.

Although the new international policy recommends hazard insurance as an ex-ante risk financing instrument, the way to use insurance for risk mitigation is uncertain in Medium-Low Income Countries (MLICs) (UNDP 2004; UN/ISDR 2004). In this context, being a previous project of the World Bank policies, the ZDS system became also a milestone in the policy shift of the Bank toward innovative measures for better risk management and mitigation efforts through 'enforcement of safer building construction practices' (World Bank 2000). As the first effort of the World Bank, the ZDS system is also shown as an instance to other MLICs that are exposed to catastrophe losses. The Bank attempts to create similar pools in Central Europe, Latin America, East Asia and South Asia (Gurenko and Lester 2004).

However, the Bank is also observed as being less persistent in integrating the ZDS system into a comprehensive disaster risk management. In fact, the technical assisstance of the Bank became limited with financial issues (Gurenko et al. 2006). The Bank's approach in other hazard insurance pools gives also priority to the use of insurance as an ex-ante risk financing tool in terms of providing affordable insurance premiums. That is, creation of these pools aims, firstly, lessening the burden of the States and international agents by transferring risks into reinsurance markets. However, linking these insurance pools to risk mitigation do not seem to be a prior aim of the World Bank. Global capital circuits can also prevent contribution to risk mitigation of these insurance pools, because higher risks means expensive reinsurance premiums and greater profit for reinsurance companies.

In fact, if risks are not mitigated, who benefits from the ZDS system is precarious: citizens, insured homeowners, State, the ZDS system, the World Bank or reinsurance companies? For this reason, there is a need to discuss and investigate the extent and the way of implementing the ZDS system for risk mitigation purpose. Hence, findings of this thesis can draw a framework for policy-makers, urban planners and local administrators in developing ways for earthquake risk mitigation in housing stock, diminishing loss of lives and financial losses to homeowners, ZDS and State. Such a research is also

useful for countries that attempt to reduce their risks and implement hazard insurance. Thus, the country experiences indicate that natural hazard insurance can be used to solve the fundamental necessities of a resilient society. Evaluation of insurance techniques and experiences of High Income Countries (HICs) with natural hazard insurance systems reveals conditions regarding their benefits and disadvantages. These experiences can be used to understand the current ZDS system and to decide the suitable strategy among alternative policy options. Therefore, evaluation of different policy options from the new international point of view can be achieved by setting basic principles for sustainable urban risk mitigation as the main criteria: 'economic efficiency' and 'social equity'. From the same point of view, therefore, the suitable strategy to implement in the ZDS system can also be investigated.

Insurance techniques (i.e. the law of large numbers, risk classification and risk-rated premiums) provide a complementary strategy for risk mitigation (Kleindorfer and Kunreuther 1999; Kunreuther 2001). There can be various ways to use these techniques of hazard insurance for risk mitigation purpose. Hazard insurance usually provides risk financing and mitigation in the market, as a business industry in the HICs. There are successful examples, where the insurance industry encourages risk mitigation through risk-rated premiums, risk communication programs at community and collective levels as well as through integrating these two levels (Ryland 2000). Yet, insurance companies in Medium Low Income Countries (MLICs) have small capacities to absorb catastrophic losses, when hazard insurance purchase in these countries is not common. Thus, these problems impose constraints on insurance for risk financing and mitigation in MLICs. For this reason, hazard insurance is usually considered difficult to use in MLICs both for risk financing and mitigation (UNDP 2004; UN/ISDR 2004).

The incalculable attribute and probabilities of natural disasters causes natural disaster risk un-insurable in the market according to insurance techniques (Andersen 2005; Ganz 1998; Li 1998). This requires to insure certain, calculable and uncorrelated risks only (Athearn 1969). The information asymmetry problem in market conditions increases the incalculability of natural disaster risk. Information asymmetry addresses that at least one party in an insurance transaction has more knowledge. Adverse selection comes out if the people, who have greater probability of loss than the average, have a tendency to purchase insurance (Athearn 1969; Karacan 1994). As a result, selling insurance to high-risk people, insurance companies can suffer from high losses (Kohler 1982). On the other hand, a company can face moral hazard, when insured people ignore protective measures and be less careful about the insured risk (Kohler 1982). Moral hazard also increases the chance of loss in insurance industry (Athearn 1969). To prevent the information asymmetry problems and to provide

accurate risk estimation, insurers can monitor and control the risks (Kunreuther 1998). Because of these problems, the insurance industry has confronted catastrophic losses from natural disasters and insolvencies in the HICs in recent years. Insolvency can be defined as being unable to pay the compensations after a natural disaster in the case of confronting excessive losses than the paying capacity of an insurance institution or company can absorb such a large loss in the normal course of business and not experience it as a catastrophe (Ericson and Doyle 2004:137-8).

The response of the industry to natural disasters varies from refusing to offer natural hazard coverage to application of new methods. However, insurance companies usually assign expensive premiums to high risk areas, when they are reluctant to offer coverage in these areas. The response of insurers offering expensive premiums causes social inequalities in protection from financial losses and do not encourage risk mitigation; and this results in the continuity of State aid after natural disasters (Kunreuther 2000). Because of increasing catastrophic losses, insurance industry continues to survive in different forms and attempt to make profit as a business by taking catastrophic loss risk of natural disasters. Firstly, insurance industry have a tendency to diminish 'information asymmetry problem' in terms of estimating risks better, as observed in many countries such as Germany and England.

In spite of 'diminishing the information asymmetry' problem in the industry, this tendency can be criticized as causing social inequalities and discrimination in the purchase of hazard insurance. Therefore, social aims of a natural hazard insurance system cannot be accomplished. Another innovative method to insure natural hazards is observed as the tendency to establish public-private natural disaster insurance pools. If these insurance pools offer risk-rated premiums through better risk estimations in market, voluntary conditions are observed as causing similar problems and not resulting in extensive risk mitigation and insurance purchase. As another policy option, implementing 'flat-rated' premiums –any incentive for risk mitigation- is also observed as not promoting risk mitigation at both community and household levels, although it provides 'social solidarity' because of working as post-disaster funds.

According to these country experiences, the survival of the current ZDS system after big earthquakes is also debatable, when earthquake risks in urban areas are not mitigated. Hence, the ZDS system confronts uncertain, incalculable and highly correlated earthquake risks in urban housing stock, which can result in catastrophic losses and 'insolvency' of the ZDS system. Urban risks, on the other hand, are not confined to risks of residential buildings, or buildings alone. To deal with these threats, the ZDS system apply other methods instead of contributing to risk mitigation, which causes further problems involved with efficiency of the ZDS system as well as equity in the society.

The ZDS system excludes the most vulnerable housing stock, i.e. the un-authorized buildings of different sorts. Having being offerred no options (i.e. risk mitigation), this housing stock cannot be included into the ZDS system, which can create reluctance to take risk mitigation measures. In addition, this exclusion can result in the continuity of the State assistance to owners of these buildings after earthquakes. Second, in spite of excluding this vulnerable stock, the ZDS system may confront catasrophic losses, because earthquake risk is still high in the housing stock that is eligible to purchase ZDS contracts. In other words, un-authorized housing stock is not completely excluded from the coverage of the ZDS system. The un-authorized buildings that have construction permission but no occupancy permission are also covered by the ZDS system if they were built before 1999 (Article 2 in the ZDS Decree). In addition, the earthquake vulnerability of the authorized housing stock is also uncertain and high because of the nature of the urbanization process in the country. Furthermore, no other risk mitigation policy exists in the country.

The high vulnerability of the housing stock seems to be the underlying reason for the failure of a compulsory implementation of ZDS. The ZDS Decree is not sufficient to implement effective penalties to enforce ZDS purchase. Yet no political willingness to approve the ZDS Draft Law is observed. Indeed, if ZDS purchase is made compulsory, accumulation of high risks in TCIP is inevitable as soon as risks are not mitigated. On the other hand, the State continues to provide long-term housing credits in spite of the ZDS Decree (Article 11). For this reason, Housing Development Administration of Turkey (in Turkish “Toplu Konut İdaresi” abbreviated as TOKİ) has been authorized to provide housing credits for earthquake survivors after Afyon earthquake in 2002 and Tunceli-Pülümür, Izmir-Urla-Seferihisar and Bingöl earthquakes in 2003 in terms of changes in related Laws (Law No. 4767 and Law No. 4123).

In this policy context, households are the sole responsible decision-makers of risk mitigation and ZDS purchase in voluntary conditions. However, experiences of many countries indicate that reluctance for risk mitigation and insurance purchase among households occur, particularly if the State-aid continues. Likewise, ZDS contracts could not be extensively sold if voluntary purchase conditions prevail. The penetration ratio of the ZDS system in Turkey is very low, as observed around 20% since its implementation. Purchase of ZDS contracts differs also across the country. Higher penetration ratio is observed in populated cities, while parts of the country are not covered by the ZDS system.

In addition, voluntary purchase of ZDS contracts can cause not only a low penetration ratio but also information asymmetry problems such as ‘adverse selection’ and ‘moral hazard’. In the existing ZDS

implementation, higher penetration ratio in the higher degree earthquake hazard zones indicates the potential of the adverse selection problem. In addition, the lack of risk mitigation policies and monitoring system of construction practices can result in the increase of earthquake vulnerability in the housing stock. This can cause a moral hazard problem for the ZDS system. However, risk mitigation activities are not practiced at the administrative level and cannot be understood at household level in Turkey. In fact, information asymmetry problems cannot be estimated because of the lack of risk monitoring and controlling mechanisms. Under these conditions, accumulation of high risks in TCIP seems inevitable, which increases the 'insolvency' risk of the ZDS system. To reduce its financial risk, i.e. insolvency risk, and to increase its paying capacity, the ZDS system transfers a substantial amount of its reserve in the TCIP, i.e. savings of households, to global markets through purchasing reinsurance instead of investing in risk mitigation.

On the other hand, voluntary conditions can result in further social inequalities in the purchase of ZDS contracts and risk mitigation behavior of households. In fact, the ZDS system represents an 'individualized and voluntary' risk management disaster policy context in Turkey. How homeowners perceive their responsibilities in this policy context is unknown. Therefore, evaluating homeowners' perception through the ZDS system can provide an understanding of how homeowners perceive the fragmented nature of the Turkish disaster policy, which could not institutionalize risk mitigation in its structure. In other words, evaluation of homeowners' perception is essential, because homeowners are the sole actors of risk mitigation and purchase of ZDS contacts. In such a political context, the main research question in the evaluation of the existing ZDS system arises as '<u>What influences the decisions of households in purchasing ZDS contracts?</u>'

Studies and research in the natural hazard field indicate that the households' decisions and behavior in voluntary conditions can be influenced by several factors. First, economic theory suggests that risk averse individuals take risk reduction measures and purchase insurance. Second, hazard/technical approach supposes that household's behaviour is influenced by their perception of the earthquake risk. Third, social vulnerability approach claims that households' perception and behaviour is influenced by their social and economic positions in society. Fourth, perceived attributes of political economy by households is usually explained by perceived responsibility of stakeholders in natural hazard research. However, 'responsibility' also refers to socio-cultural attributes of society in risk approaches as characteristic of the 'risk society'.

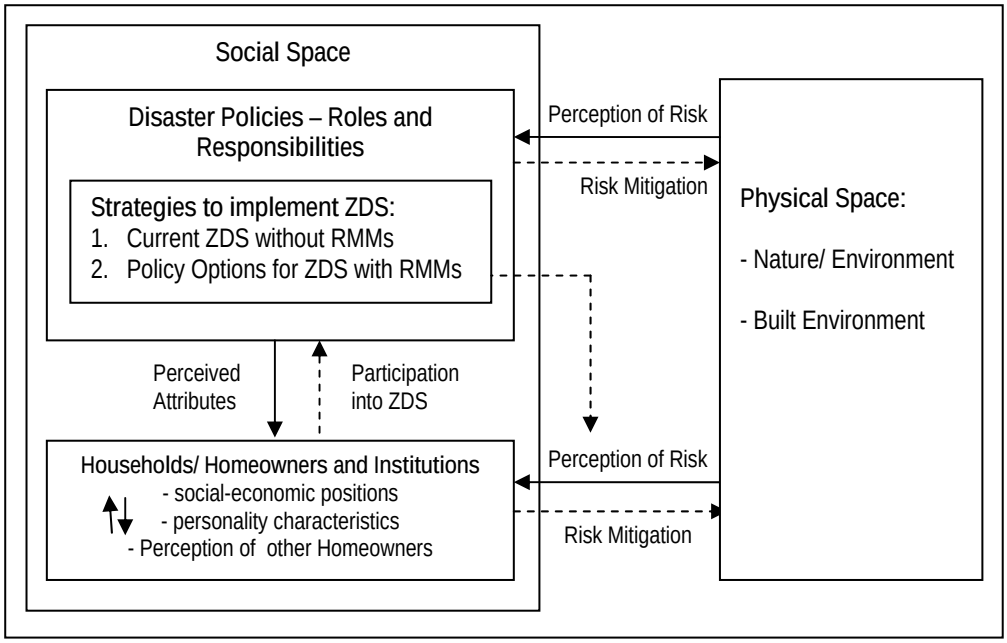


Figure 1.1. Framework to Evaluate Factors Influencing Decision Making of Homeowners in Purchasing ZDS and Taking Risk Mitigation Measures

Based on the variety in research fields, households' behavior is not limited with their personal attributes and perception of nature and built environment, but also influenced from socio-economic and cultural attributes of households. In addition, political economic and cultural context of society can limit or enable households' behavior, whereas gatekeepers, e.g. agents or institutions in the political context, can influence households by establishing power relations, responsibilities and roles (Palm 1990). These determined roles, on the other hand, can change perceptions and behavior of households. In other words, attributes of households as primary units of society reflect political and economic context. In addition, perceived behavior and attributes of other households, i.e. social influence, can influence the behavior and perceptions of households.

Therefore, households' decisions for the purchase of ZDS contracts can be influenced by the perception of the political economic system, the perceived risk levels, socio-economic vulnerabilities, socio-cultural values and beliefs, and perceived behavior and attitudes of other households. Since there is no comprehensive risk mitigation strategy, their risk mitigation behavior can vary according to these factors. Indeed, 'individualized' and 'voluntary' policy implementation of the ZDS system can

limit households to perceive their risks and the importance of taking risk mitigation measures in the disaster policy context of Turkey. Perceiving ZDS purchase as voluntary, therefore, can lead to not individuals' declining of purchasing ZDS contracts and taking other risk mitigation measures.

Thus, households that have purchased ZDS contracts in the existing ZDS system can perceive purchase of ZDS contracts as compulsory and/or have a general socio-cultural attribute to purchase insurance. These households may also perceive social solidarity attribute of the ZDS system more than households that declined to purchase ZDS contracts. In addition, perceived attributes of disaster policies and the ZDS system can differ according to socio-economic and cultural attributes of households. In other words, insured households can have higher education and income level. In addition, insured households may also perceive earthquake risk and necessity of risk mitigation more than un-insured households. Hence, failure in perceiving ZDS as compulsory can endanger social solidarity and trust in society by creating new vulnerability positions depending on socio-economic and cultural differences in society.

Based on points reviewed above, the existing ZDS system can be criticized as:

1) The current ZDS system partly compensating realized loss only, does not encourage participation but causes disregard of risks and the necessity of mitigation efforts. Whereas if the system was organized to encourage and fund mitigation efforts, not only greater penetration could be expected, but also a shift to the social concerns of resilience.

2) In a voluntary insurance system, individuals freely operate in the market. Voluntary nature of the purchase of ZDS contracts endangers efficiency of the ZDS system, curbing participation, creating reluctance for risk mitigation, and the persistent expectation of potential State-aid. Whereas, protection of life and property is a social obligation and public responsibility. It is necessary therefore to have a system that oblidges participation. This obligation could be structured not only with a national provision by the central government, but could be monitored at different levels in its more powerful enforcement. If local administrations could also be involved, greater number of tools could be operated to increase participation rates, and improve the state of risk awareness in the society.

3) Implementation of the ZDS system targeting earthquake risks of individual buildings ignoring the need to encourage risk mitigation does not necessarily increase socio-spatial resilience of the country against earthquakes. Earthquake risks are not limited to some part of the residential buildings, but involves other buildings probably with higher risks,

non-residential buildings, and other forms of risks particular to the built environment as a whole, which could be described as ‘urban risks’. Thus, pricing the ZDS premiums necessitates consideration of variations in locational and structural attributes. Yet the existing ZDS system lacks This type of information, The information about where and which buildings are more vulnerable, and reduces the efficiency of the ZDS system. This type of information could be more readily available at the local context, therefore points again to the need to involve local administrations in the zds system.

4) The problems of The ZDS could be overcome through considering, monitoring and reduction of urban risks as a whole, which necessitates cooperation with other stakeholders, particularly with local administrations, as the Incheon Declaration (2009) points to the role and functions of local administrations as effective actors in the maintaining of the resilience of communities. Otherwise, new socio-spatial inequalities based on differences in the attributes and perceptions of households come into existence.

Example of public-private insurance pools that are in cooperation with local administrations can be observed in National Flood Insurance Program (NFIP) of the United States of America (USA). This model presents ‘a comprehensive risk management model’ to link hazard insurance and risk mitigation. This model makes evident that insurance can be used both for risk financing and mitigation, when insurance pool can be efficient depending on extensive risk reduction and purchase of insurance by low risk property owners. Risk mitigation is institutionalized in NFIP since 1968s, when NFIP is administered by the Federal Emergency Management Agency (FEMA) and integrates federal and local governments with private insurers as well as with households. This program forces local governments to adopt flood plain measures through land use planning and building codes. This model not only monitors and enforces local governments, but also encourages and finances their risk mitigation projects in terms of a community grant program. In addition, there are also discussions in USA to constitute an earthquake insurance program like NFIP (Godschalk et al. 1998).

If insurance pools like TCIP can be made integral part of a comprehensive risk management, then a national program can encourage, finance and monitor risk mitigation activities of local administrations and households. Thus, the ZDS system is critical in Turkey to develop and implement risk management strategies in both community and household levels.

It is not surprising to observe discussions about integration of the ZDS system with risk mitigation in the Turkish context. According to Balamir (2001a; 2004a), for instance, the suitable strategy for implementing risk mitigation in Turkey necessitates the constitution of a Risk Mitigation Fund (RMF), when TCIP can contribute to this RMF. This causes and depends on increasing the penetration ratio of the ZDS system through its compulsory implementation that can be acHieved in terms of interventions and involvement of local administrations. In addition, according to Gulkan (2001) TCIP can encourage adoption of mitigation measures in terms of taking the lead in developing guidelines. Based on these two proposals and experiences in USA, Kunreuther et al. (2004: 125-132) claims that risk mitigation at local and building scales can be achieved through the ZDS system, if the ZDS system can offer incentives, i.e. premium reductions that are linked to risk mitigation loans to encourage homeowners. In addition, such a strategy requires linking the ZDS system to implementation of building codes and land use planning. According to Kunreuther et al. (2004: 125-132), use of insurance techniques to promote proper mitigation measures by the ZDS system will reduce the cost of the ZDS system and reinsurance costs by lowering expected direct and indirect damages and fatalities.

Therefore, the suitable strategy to implement the ZDS system, i.e. achieving efficiency and equity of the ZDS system, requires linking the ZDS system to risk mitigation implementing through 'risk-rated' premiums and 'compulsory' purchase. This can be achieved by cooperation of the ZDS system with local administrations, where a more comprehensive risk reduction system can be operated other than the risk reduction efforts in a specific part of the building stock. High penetration of the ZDS system and collective risk mitigation depends on the implementation of urban risk mitigation plans, projects and policies and extensive participation of stakeholders. This approach could lead to diminished threats to the ZDS system, and purchase of ZDS contracts can expand. In this way, the ZDS system can further enhance urban risk mitigation planning beyond the physical plans by involving plans with social processes and actors. In other words, the main deficiencies in the urban planning process, i.e. inspection problem, can be overcome through pro-active involvement of local communities and households with earthquake risk reduction and hazard insurance. That is, households can have a proactive role in risk mitigation, with linked to local administrations. In this way, the ZDS system can also be efficient with reduced risks in the housing stock. However, implementing such an hazard insurance model can require complementary policies and strategies in MLICs like Turkey.

According to Kunreuther et al. (2001: 5), risk reduction strategies/policies requires, however, technical and financial tools such as providing information, incentives, mandates, regulations and standards that can be directed to homeowners since their understanding of roles and the decision process in participating such policies is critical in Turkey. Likewise, the new international approach claims that each country should develop their own risk reduction strategies in accordance with their own political economic, social and cultural context in terms of a bottom-up approach (Yokohama Strategy 1994; Hyogo Framework 2005). Developing a strategy, which will reduce risks, decrease losses and provide necessary financial compensation, requires a contemporary approach in legal and institutional processes as well as an understanding of roles, opportunities and limits of actors, and their decision making in this process in the country context. In addition, since households are the main actors of collective risk reduction, they should be made proactive agents of natural disaster risk management.

To classify these arguments, they need to be converted to hypotheses, concentrating on decision making of homeowners that are eligible to purchase ZDS contracts in a high risk area is considered here as a convenient method of evaluating the existing ZDS system, the disaster policy of Turkey and policy options. Particularly comparison of insured and un-insured households in the very same buildings can reveal the reasons of differences with their socio-economic and cultural attributes, and perceived risks as well as perceptions of the ZDS system, and the overall disaster policy of Turkey. In addition, their treatment to risk mitigation can also differ in relation to their ZDS purchase; and attributes and perceptions. In the same way, if tendencies of the households for varying policy options are evaluated according to their ZDS purchase, the underlying reasons can be revealed, when these reasons can also differ according to their attributes and perceptions.

Therefore, a household questionnaire has been designed and carried out in a high earthquake risk district of Istanbul, Zeytinburnu, in line with the international literature. The questionnaire is designed with reference to potential factors that can influence homeowners' decision process and behavior for purchasing ZDS contracts in the existing system of ZDS and the tendencies of households for alternative policy options. Selection of Zeytinburnu as the field study has several reasons. Firstly, Zeytinburnu can confront immense losses because of a big magnitude earthquake that is expected to Istanbul. Zeytinburnu is not only close to the Marmara earthquake fault line, but it also has a highly vulnerable housing stock, because almost all houses in Zeytinburnu were transformed from squatters to un-authorized apartment buildings. Secondly, observed social and economic attributes of Zeytinburnu are lower than average levels in other districts of Istanbul. There is also a most active and productive economic activity in the area, and a variety among socio-economic status of homeowners in the district.

The sample of the questionnaire was determined from the database of DASK for Zeytinburnu, which included insured dwelling units in the district and unexpectedly offices and commercial units. Since the data could not be matched with the geographical database of Istanbul Metropolitan Municipality (IMM), the study has been limited to conduct a geographical sample selection and further analysis. Therefore, the sample is selected among homeowners that are owner-occupiers and have only one house in the district. During the field survey, questionnaires are distributed and recollected after 2 - 3 days. In addition to the selected insured homeowners from the database of DASK, another un-insured homeowner at the same building is asked to fulfill second questionnaire. However, many homeowners refused to fill the questionnaire, and others gave back un-filled questionnaires during recollection. Higher return rate was obtained from insured homeowners, while higher refusal rate was among un-insured homeowners. Indeed, this reluctance of un-insured homeowners can be accepted as an indicator of the differences among insured and un-insured homeowners.

The treatise has been developed in six chapters. Chapter 1, i.e. the introduction, states the subject, background and rationale of the thesis. It also defines the problem, and objectives, and outlines the theoretical framework. Research design, questions, hypotheses and sub-hypotheses are also outlined. Short descriptions of the case study, survey methodology and questionnaire are given, which are detailed in the following chapters. Chapter 2 reminds, firstly, that the 'risk mitigation' was among the objectives of the ZDS system during its establishment, although the ZDS system is observed as not achieving this essential aim as a post-disaster loss compensation mechanism. However, risk mitigation is necessary in Turkey because of the high earthquake probability and vulnerable urban areas. Similary, the policy shift in the new international arena toward 'risk mitigation' and 'sustainable development' in the frame of the 'natural disaster risk management' emphasises the essential role of 'urban planning'. Parallel to the new international policy, the ZDS system is expected to contribute into risk mitigation as observed in the discussions in Turkey.

To find out the ways and extend of using the ZDS system for risk mitigation and financing, Chapter 3 discusses, firstly, the insurance mechanisms and techniques. Then, the national experiences with the natural hazard insurance, particularly in High Income Countries (HICs) are under scrutiny. Next, the policy options to implement natural hazard insurance in the Medium-Low Income Countries (MLICs) are discussed from the new international policy point of view. It is observed that the socio-spatial perspective of the new international policy seem to provide a framework to study natural disaster risk in the field of urban planning, which can be comprised within the 'world risk society' theory of Ulrich Beck (1992b). On behalf of the role of the hazard insurance in the contemporary society, a reflexive

enlightenment – through Beck's words- in MLICs like Turkey seem to be achieved, if these the natural hazard insurance pools could be used as a policy tool of urban risk mitigation planning.

Chapter 4 evaluates the current ZDS system from the new international policy perspective (Chapter 2), whether the current ZDS system creates 'resilience' against earthquakes in Turkey or not, in terms of the theoretical discussions and national experiences in the world involved with the natural hazard insurance and risk mitigation (Chapter 3). To create resilience, the ZDS system could be expected as operating efficiently considering the social equity in the society. The techniques used in the ZDS system, however, seem to cause its inefficiency and to create social inequalities. To complete the evaluation of the current ZDS system and the alternative policy options to create resilience, a households survey was carried out in a high risk area Zeytinburnu, Istanbul. Chapter 5 lays out the methodology of the Zeytinburnu field survey, i.e. the structure of questionnaire and methodology of analyses. assessing households' decision process and behavior is necessary to envisage such kind of policies and strategies for risk mitigation and insurance from a bottom-up participation perspective. The integrated approaches in the new international disaster policy provides the means to assess households' decision process from different perspectives such as technical-hazard approach, social vulnerability approach and socio-cultural approach. In addition, perception of the political context as perceived by households and processes of building up the suitable power and role relations necessitates 'a stakeholder approach'. This chapter also presents the characteristics of the study area, i.e. Zeytinburnu district, the sample selection methodology and the field survey.

The findings of the empirical analyses are presented in Chapter 6 in accordance with hypotheses and sub-hypotheses. First part of the empirical analyses attempts to find out main factors influencing ZDS purchase behavior of households. Hence, analyses are based on comparison of insured and un-insured Hhs in terms of their socio-economic attributes and perceptions as well as risk reduction behavior. Their perceptions encompasses 'perception of earthquake risk' and 'perceived attributes of the ZDS system', when the analysis on the risk reduction behavior of households includes their general risk aversion, risk mitigation in the building and emergency preparedness measures at home. Finally, their tendencies for alternative ZDS and risk mitigation policy options are investigated. Chapter 7 discusses findings of the empricial study in Zeytinburnu field survey how it provides insight for the evaluation of the existing ZDS system, and possible policy options to implement a more efficient ZDS system in Turkey. This chapter attempts to contribute also to the organizational and legal structure of natural disaster management in Turkey. Hence, this chapter presents the suitable way to implement the ZDS system and risk mitigation based on the findings of the field survey in Zeytinburnu; and points to further lines of research.

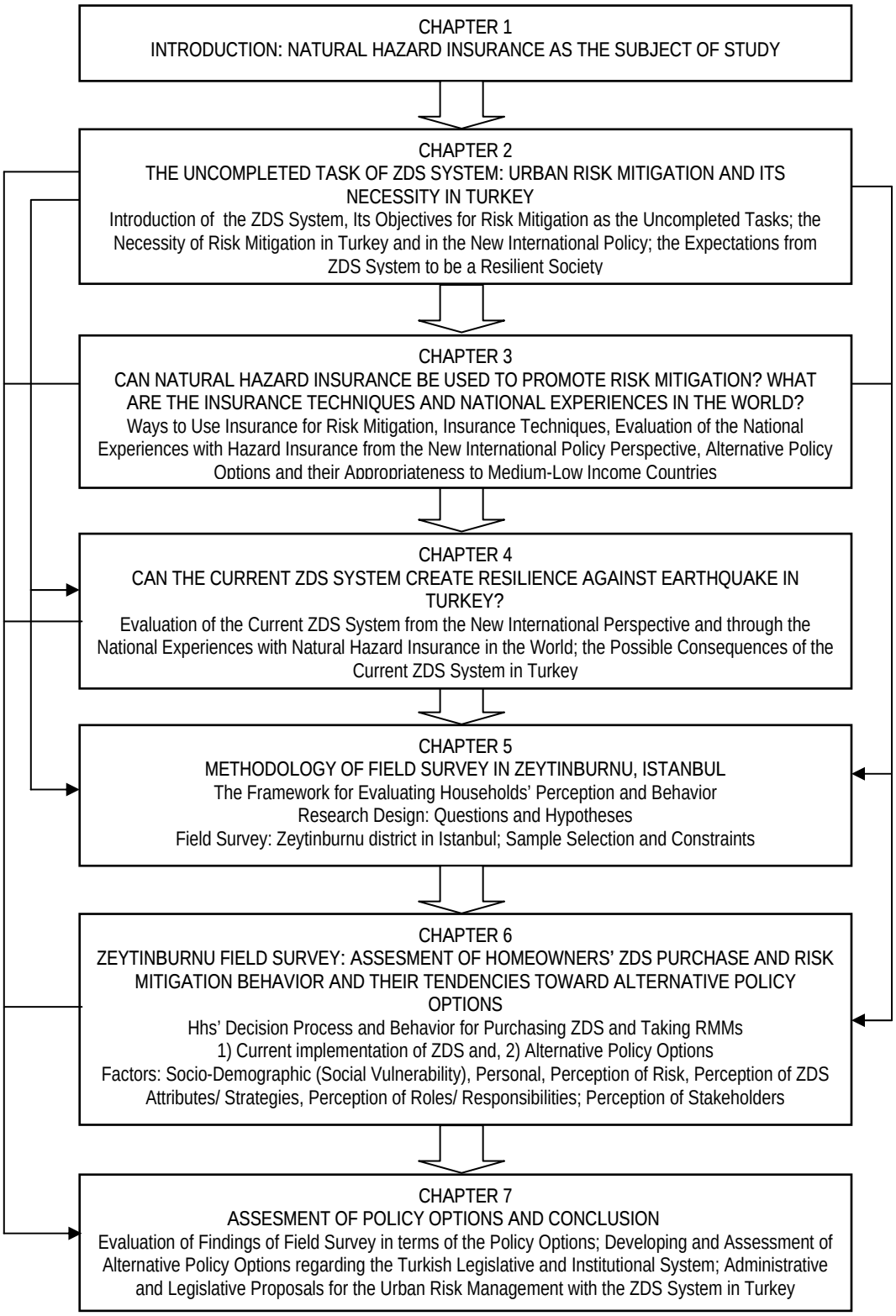


Figure 1.2. Flowchart of the Treatise

CHAPTER 2

THE UNCOMPLETED TASK OF THE ZDS SYSTEM: URBAN RISK MITIGATION AND ITS NECESSITY IN TURKEY

The introduction of ZDS system after 1999 Marmara Earthquakes aimed to lessen the financial burden of the State and promote better construction across the country in terms of insurance techniques. These objectives of the ZDS system represented the disaster policy shift in Turkey from post-disaster activities toward pre-disaster risk mitigation and financing. However, the ZDS system could not contribute to risk mitigation since its introduction, whereas risk mitigation seems to be the essential aim of a resilience society against earthquake risk in Turkey. Likewise, the international policy also emphasises the importance of the sustainable risk mitigation, when giving priority to 'urban planning'. This uncompleted task of the ZDS system is also criticized in Turkey, as the high earthquake risk, the vulnerability of urban areas against earthquakes and the deep concern about creating resilience in society against natural disasters cause the rise of expectations from the ZDS system.

2.1. THE ZDS SYSTEM WAS ESTABLISHED TO LESSEN THE FINANCIAL BURDEN OF THE STATE AND TO PROMOTE BETTER CONSTRUCTION OF BUILDINGS

In Turkey, urban areas are highly exposed to earthquake hazards because of proximities to active earthquake faults. Construction practices, on the other hand, resulted in highly vulnerable building stock. Underlying reason of this vulnerability in urban built environments of the country can be attributed to deficiencies in urban planning and building construction systems during rapid and uncontrolled urbanization since 1960s. On one hand, urban plans have rarely included sufficient earthquake safety elements as observed in the Development Law (No: 3194). On the other hand, local authorities were constraint with technical, financial and political problems in meeting the needs of rapid population growth in cities. Under these conditions, built environment could not be produced with necessary standards. Authorized housing stock is constructed with little control in taking measures against earthquakes, when self-constructed un-authorized houses by immigrants are another source of vulnerabilities.

Although Turkey had experienced a series of heavy losses in earthquakes [1], the country has developed legal and institutional regulations and interventions concerning post-disaster activities. This conventional model of disaster management is elaborated in the Disasters Law (No: 7269). Emphasising recovery and reconstruction in this conventional approach has discouraged pre-disaster risk mitigation at both administrative and household levels. Indeed, limits of post-disaster emphasis and the sole responsibility of State for loss compensation had been understood after immense physical destruction and socio-economic impacts of 1999 Marmara Earthquakes, as slowing down the country's development. After 1999 Earthquakes there has been observed an increasing awarenes of necessity for risk reduction in Turkey. Immense losses in 1999 Earthquakes caused several legal and institutional changes toward pre-disaster activities. The provision of ZDS system, i.e. the Decree (No.587) became the first step of this awarenes, because it was involved with the two fundemantal problems of the country: t*o provoke direction of investments into risk mitigation* and to *compensate disaster losses*. the Construction Supervision Law (No: 4708) and Proficiency in Constructional Professions (Decree Law: 601) were other provisions that were enacted in sequence after the launch of the ZDS system, indicating the shift in the disaster policy of Turkey toward better construction of buildings.

2.1.1. 1999 Earthquakes caused to launch the ZDS System immediately to prevent catastrophic losses of future earthquakes

The ZDS system was introduced after the immense socio-economic effects of 1999 Kocaeli (17 August; Mg:7.4) and Düzce (12 November; Mg:7.2) Earthquakes. The country had no sustainable financial system to compensate earthquake losses, before the 1999 Marmara Earthquakes. Although the Disaster Fund was established in 1968 (Law No: 1051), the Fund became insufficient to cope with the financial losses of natural disasters due to cut off in the re-payments of long-term reconstruction credits [2]. The privatization of the financial resources of the Fund in 1992 [3] caused the Fund to be included into the State budget, when all funds in the country were also closed (Law No. 4689). The 1999 Marmara Earthquakes had caused Turkey to confront highest loss of lives, physical, social and economic losses from earthuakes. Between 1992 and 1999, the State had confronted nearly US$ 2 billion total financial losses from earthquakes. However, the direct economic losses after 1999 Marmara Earthquakes were declared as US$ 16-20 billion (ISDR-EMDAT 2009), which was explained by the State Planning Organization as nearly 7-9 % of the country's GDP in 1999 (SPO 2000). These earthquakes took place in a large region (2000 km2), where seven cities (Kocaeli, Istanbul, Adapazar1, Bursa, Bolu, Düzce, Yalova) are settled with 23 % of Turkey's total population (SPO 1999). As a result, 18.373 people lost their lives and 48.901 people were injured (SPO 2000).

The 1999 Marmara Earthquakes caused the 35% of the country's economy, 46.7% of the country's industrial activities and the 34.6% of country's commercial activities to be adversely infected. Despite, the burden of the State was lessened because a substantial part of big industries were insured [4], although the greatest industrial investments were located in earthquake region. (SPO 1999). On the other hand, insurance purchase ratio in residential houses was very low in the country before the ZDS system, although various methods were applied to regulate earthquake insurance in private market [5]. During the 1999 Marmara Earthquakes, only 15% of the houses in Istanbul and 2% of the houses in the rest of the country were insured (EQE Briefing 1999), when the State was the sole responsible for compensation of earthquake losses through the Disasters Law (No. 7269).

Thus, the State had to find nearly US$ 6,2 billion to compensate earthquake losses (SPO 2000), because nearly 600.000 persons became homeless, when 120.000 families were left in need of housing [6]. Due to insufficient financial resources the State had to re-allocate the annual budget and created national resources such as enacting a special earthquake tax (Erdik 2001). In addition, the State had to apply for the foreign debts of the international donors such as World Bank and European Investment Bank. Signing a loan agreement with the World Bank. The highest loan is obtained from the World Bank as nearly US$ 758 million in terms of the Marmara Earthquake Emergency Reconstrucion Project (MEER) (Wilczynski 1999).

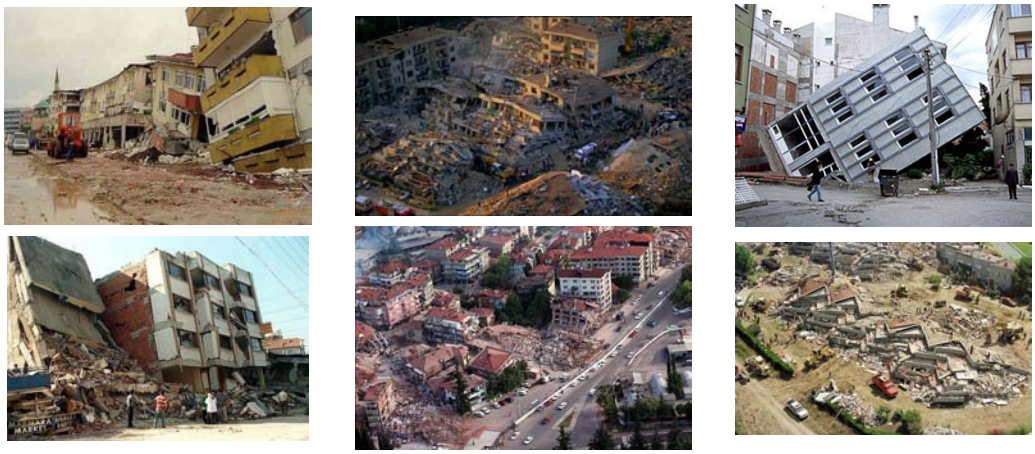


Figure 2.1. The Destruction in the Housing Stock in 1999 Marmara Earthquakes
(Source: CNN-TURK)

2.1.2. Promoting risk mitigation was among the objectives of the ZDS System

The ZDS system was introduced as a part of a risk mitigation project, i.e. the MEER, of the World Bank (2000) and represents the shift in the disaster policy of Turkey from conventional model of disaster management toward disaster risk mitigation and management. Thus, the government had decided to implement the ZDS system to lessen the financial burden of the homeowners and the State. However, 'contributing to safer building construction and risk mitigation' was stated in three articles of the ZDS Decree (d, e and f) as further essential aims of the ZDS system [No. 587 in Appendix A]:

a) Including all buildings in the coverage of the ZDS system through affordable premiums,
b) Lessening the financial burden of the State,
c) Transferring earthquake risk into international reinsurance and capital markets through insurance,
d) Increasing the quality of the building standards through pricing ZDS premiums in terms of detailed risk modelling that considers soil conditions and building attributes,
e) Using insurance system as a tool in production of safer buildings, and
f) Supporting the studies involved with risk mitigation methods and applications.

The State intended to provide strong incentives for ex-ante risk mitigation through implement risk-based premiums through detailed risk models, safer construction practices were to be promoted through the improvement in the enforcement of the construction codes (Gurenko et al. 2006:22). In other words, the underlying reason to establish the ZDS System was to create resilience against earthquakes through constituting a sustainable risk management and mitigation system.

2.1.3. Provisions for better construction practices were enacted after the ZDS System

To promote risk mitigation through construction practices, several other new provisions were also introduced as involved with the deficiencies in the construction practices and urban planning, after the introduction of the ZDS system as:

a. Building Supervision: The Building Supervision Decree (No. 595; 10.04.2000) was enacted for ensuring life and property safety in buildings, preventing unplanned, uncontrolled and low-quality construction that wastes resources, ensuring proper construction, protecting rights of those whose property is damaged. However, the Decree had been criticized for several reasons [7] and was invalidated by Constitutional Law in 2001. In the same year, a Building Supervision Law (No: 4708) in 2001 was enacted as concerning establishment and functioning of building inspection firms were reformulated [8]. Building Supervision Law modified the respective provision of the Development Law

(No. 3194) and authorized building inspection firms to take over from the administration, the task of technical liability mentioned in the Development Law (Keleş 2004).

b. Proficiency in the Construction Professions: A Decree (No. 601; 28.06.2000) was adopted in 2000 and covered Proficiency in the Construction Professions. Existing Law on Engineering and Architecture and Law of the Union of Chambers of Engineers and Architects were amended by this ordinance, in which requirements for improved professional competence in the fields of engineering and architecture are detailed. A minimum of five years of professional experience, attendance at training courses, and passing written exams organized by both concerned chambers are the required conditions (Balamir 2001a:226).

This increasing awareness for risk reduction can also be observed in the concern on mitigation and preparedness of recent national reports as 'National Strategy of the Reduction of Earthquake Losses' (UDK 2002) and reports of 'Earthquake Convention' (MPWS 2004). In addition, a number of mitigation and preparedness plans and projects, e.g. Earthquake Master Plan of Istanbul (EMPI 2003) and Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP) have also emphasized the issue, particularly for Istanbul. Further, Local Administration Reforms were other attempts to improve authority and financial resources of local administrations in natural disaster management [Appendix B].

2.1.4. Institutional Structure and Coverage of the ZDS System

The ZDS system began to operate for risk mitigation and financing purposes in terms of an insurance pool that is known as the Turkish Catastrophe Insurance Pool (TCIP), which is governed by a seperate state-owned legal entity, the "Natural Disaster Insurance Institution" (in Turkish "Doğal Afet Sigortaları Kurumu", abbreviated as DASK). There are three main bodies constituting the structure of DASK as 'the General Directorate of Insurance', 'the Board of Directors', and 'the Operational Manager'. DASK works under the supervision of the General Directorate of Insurance, which is a part of the under secretariat of the Treasury. The General Directorate of Insurance is responsible for the design and announcement of the principles, general conditions, tariffs, and procedures of ZDS system. Board of Directors monitors the performance of DASK and provides technical support. Members can only be appointed by the Ministry after the determination of the Treasury for five years and can work at most two periods [9].

The 'operational manager' of DASK can be contracted out by the under secretariat of Treasury. Operational manager is determined among the foreign and domestic insurance and reinsurance companies for five years. The agreement is made with Milli Re for the 5 years, which is the largest reinsurer in Turkey. The second agreement is made with Garanti Re in 2005. Insurance companies that are permitted to work in Turkey under the Law of Insurance Arrangement (No: 7123) (No. 7397), are selling the insurance policies to real estate owners on behalf of DASK and they are responsible to transmit all risks and premiums to the Operational Manager. There are currently 30 insurance companies authorized to issue the ZDS contracts. Operational Manager pays a commission amount to insurance companies according to the amount of written ZDS contracts. This commision is determined as the 12,5 % of written ZDS contracts in Istanbul and 17,5 % of written ZDS contracts in other cities. In addition to the ZDS contracts, insurance companies can offer two earthquake insurance policy that cover earthquake losses. These policies can be bought by homeowners in the market as voluntarily. The homeowners can purchase insurance above the compensation amount of the ZDS contract as an allied peril for home and fire insurance in the market. Another insurance policy is offered for the housing assets by insurance companies. However, the homeowners are neither allowed to buy any other earthquake insurance from market, nor to get the assistance of the State, if they do not purchase ZDS contract.

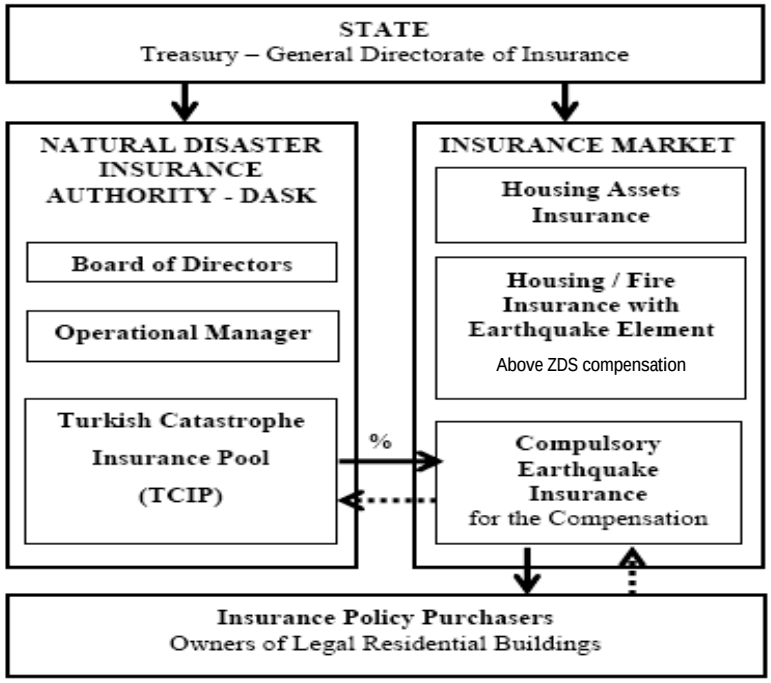


Figure 2.2. Structure of the Earthquake Insurance for Residential Areas in Turkey

Purchasers of the ZDS contracts were defined as the owners of the legally built residential buildings (recorded in the Title Deed in the boundaries of municipalities) and parts of them as independent units according to the Flat Ownership Law (No. 634). DASK is not offered to the buildings constructed after 27/12/1999, either, if they have not any license. In other words, the illegally built houses, which were built on their own land, but have no license or title deed before this date, can purchase ZDS contracts, whether they are included to the Flat Ownership Law or not. However, the un-authorized house buildings, which were built on the land of Treasury or other persons without any permission, are not eligible to purchase ZDS contracts. In addition, the professional offices or small businesses, which have the independent and privately owned sections at the residential buildings, are obliged to purchase ZDS contracts. Besides, private buildings, which are built by State or given credit by State or constructed by the State after previous disasters, have to purchase ZDS contracts.

With the implementation of the ZDS system, the State has no more responsibility for reconstruction, because the Disasters Law was changed with the introduction of the ZDS system. Therefore, the ZDS system became the sole resource of the country for the compensation of the earthquake damage losses and for the reconstruction of urban housing stock. Nevetheless, 'homeowners' became other main actors that are responsible for purchasing ZDS contracts. This means that if homeowners do not purchase ZDS contract, they could not receive any assistance by the State after a disaster. In addition to the ZDS sytem, the buildings that are used only for commercial or industrial purposes like business centers, administrative buildings, and education buildings, whether they are included in the "Flat Ownership" Law No. 634 or not, can purchase earthquake insurance as an allied peril to the commercial, industrial insurance policies from the private insurance companies in the market. On the other hand, the compensation of the public buildings like hospitals and schools, the buildings in rural areas, the buildings, which were built after disasters by State, is still dependent on State through the Disaster Law (7269).

2.2. IS THE RISK MITIGATION OBJECTIVE ACHIEVED BY THE ZDS SYSTEM SINCE 2000? DO THE EXISTING ATTRIBUTES OF THE ZDS SYSTEM PROMOTE RISK MITIGATION?

To achieve its objectives described in the ZDS Decree (no. 587), the ZDS system began to offer compulsory earthquake insurance to property owners in urban residential areas across the country since September 2000. The ZDS contract is a stand-alone earthquake insurance product and includes also secondary perils of earthquakes such as fire, explosion and land-slides. To implement the ZDS system, a public-private institution was established as a "Natural Disasters Insurance Authority", which is abbreviated as DASK in Turkish. To execute the financial compensation of losses future earthquakes Turkish Catastrophe Insurance Pool (TCIP) is established.

2.2.1. The ZDS system failed to implement compulsory purchase of ZDS contracts

At the beginning, the ZDS system was envisaged to enforce the purchase of ZDS contracts through effective penalties. However, the ZDS purchase is not made compulsory in reality and the ZDS contracts are purchased by homeowners as 'voluntarily'. Although the houses in the coverage of the ZDS system has to purchase the ZDS contracts according to the Article 9 of the ZDS Decree, effective penalties cannot be implemented through the Decree, according to the Laws of Turkey. Despite, the Draft Law of the ZDS system, which can enforce homeowners to purchase of ZDS contracts through effective penalties could not passed in Turkish Parliament (TBMM) since 2000. On the other hand, 'monitoring the purchase of ZDS contracts' was thought as another enforcement aas defined in the Article 12 of the ZDS Decree [Appendix A]. Accordingly, the public institutions cannot be transacted property related issues, including the title deeds of buildings, unless the homeowner documents the ZDS contract. However, no controlling mechanism could be implemented in the mean time except the requirement of the ZDS contracts for Title-Deed during housing transaction process. Although requirement of the ZDS contracts during electiricy, water and natural gases payments was in the agenda of DASK, this cannot be realized. In addition, the Article 12 of the ZDS Decree entitled DASK to use the records of provinces, municipalities and the registry of title-deeds to determine the eligible people to purchase ZDS contracts. However, there is also observed no attempt of DASK to use these records of public institutions.

2.2.2. The ZDS Tariff offer risk-rated premiums that can encourage risk mitigation

The ZDS system aimed to 'increase the quality of the building standards' through 'pricing ZDS premiums' in terms of 'detailed risk modelling' that considers 'soil conditions' and 'building attributes'. Therefore, insurance system was intended to be used as tool in production of safer buildings. Hence, the way to support the studies involved with risk mitigation methods and applications could be achieved in this way [Objective 'd', 'e' and 'f' in the ZDS Decree in Appendix A]. In other words, the premiums in the ZDS contracts were intended to be risk-rated premiums to encourage risk mitigation in the housing stock. For this reason, the factors to be used in the premium determination were explained in the Article 10 of the ZDS Decree. Accordingly, the ZDS premiums are to be determined in terms of the size of the building, the class and quality of construction, geological attributes of the land, on which building is constructed, earthquake risk and similar factors. In addition, the Ministry to which the Treasury is dependent, was authorized to determine the compensations, general conditions, the Tariff and the method and ways for the payment of premiums.

The current ZDS system determines the premium prices and compensation amounts through the General Conditions of DASK and the Tariff of the ZDS system by the General Directorate of the Insurance of Treasury since 2000 [Appendix A and Appendix A]. The compensation is determined through multiplication of the construction cost per each square meter and size of the dwelling unit. This calculation of premiums is made through the ZDS Tariff that includes 15 different coefficients that are obtained from three building construction type and five hazard zones in the country scale earthquake hazard map of Turkey. Coefficients in the Tariff are multiplied with compensation amount. Premium and compensation amount differ according to 'building construction costs'. According to existing Tariff (01.01.2009), building construction cost per square meter (m^2) is determined as 550 TL for steel and concrete buildings, 395 TL for masonry and stone buildings, and 205 TL for orher buildings.

However, these factors that are used for pricing premiums and compensations in the existing ZDS Tarif do not reflect accurate vulnerability and risk levels of the buildings that can be linked to construction practices and that can encourage homeowners for risk mitigation:

- 'Earthquake risk in urban areas' cannot be reflected into the ZDS Tariff. The 'counry scale earthquake hazard map' is used to determine earthquake hazard. This map was includes five different hazard zones. Use of country scale hazard map does not give accurate information about the earthquake probability and vulnerability in urban areas (Figure 2.3). Geological attributes of land on which the building is constructed, although earthqake hazard probability varies in urban scale soil

characteristics in a neighbourhood and requires *micro-zonation maps*. In addition, this country scale earthquake hazard map does not consider 'urban risks' as the characteristic of the housing stock, neighbourhood, and risks arise from correlation of usages.

➢Quality and vulnerability of the buildings are not used in the ZDS Tariff. The construction types of the buildings are classified as 'steel-concrete', 'masonry-stone' and 'other' structures. This type of information on the buildings' vulnerability is insufficient to classify and calculate risks. When most of the buildings in Turkey are constructed with steel-concete technology, there is used any other factor to determine the risks in these buildings. Besides, the age of the building is not used for risk classification, when the used categories does not reflect the dates of changes in the building codes.

➢The ZDS Tariff does not reflect the size of the building. Instead, 'the size of the dwelling units' in the buildings are considered in the determination of the houses. Therefore, the whole building cannot be insured.

➢No deductibles in the ZDS Tariff prevent encouraging homeowners for risk mitigation. The ZDS system does not use contractual methods to obtain the risk information from insured households and to encourage them for risk mitigation, which requires to link the ZDS system into construction practices. For this reason, the ZDS Tariff cannot be linked to safer construction practices.

➢No study to improve the ZDS Tariff through detailed risk modeling since 2000. Being a financial instutions limits the technical capacity of DASK to develop earthquake risk models, and urban risk maps as well as assessing the vulnerability of the buildings. However, the ZDS system has no effort to cooperate with central and local public institutions and private firms, such as local administrations and building inspection firms.

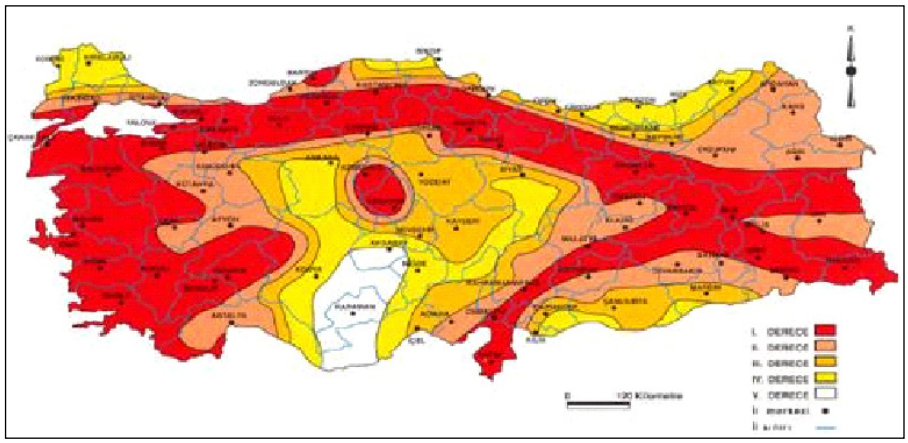


Figure 2.3. Earthquake Hazard Map of Turkey
(Source: GD-DA 2009)

Table 2.1. The ZDS-Tariff
(Source:DASK 2009)

Construction Type of the Building	Earthquake Hazard Zones				
	I	II	III	IV	V
Steel-concrete Structures	2.20	1.55	0.83	0.55	0.44
Masonry-Stone Structures	3.85	2.75	1.43	0.60	0.50
Other Structures	5.50	3.53	1.76	0.78	0.58

Table 2.2. The Premiums and Compensations for 100 m2 Dwelling Units
(Source: DASK 2009)

Construction Type of the Building	Compensation (TL)	Premiums in Earthquake Hazard Zones (TL)				
		I	II	III	IV	V
Istanbul						
Steel-concrete Structures	55.000 (100 m^2 x 550 TL)	136.00	100.30	60.70		
Masonry-Sone Structures	39.500 (100 m^2 x 395 TL)	167.10	123.60	71.50		
Other Structures	20.500 (100 m^2 x 205 TL)	127.80	87.40	51.10		
Other Cities						
Steel-concrete Structures	55.000 (100 m^2 x 550 TL)	131.00	95.30	55.70	40.30	34.20
Masonry-Sone Structures	39.500 (100 m^2 x 395 TL)	162.10	118.60	66.50	33.70	29.80
Other Structures	20.500 (100 m^2 x 205 TL)	122.80	82.40	46.10	26.00	25.00

2.2.3. However, the country could not develop a comprehensive earthquake risk management program and no other risk mitigation policy

In addition to the failures in the ZDS system, the country could not develop a comprehensive disaster risk management program since 1999 [Appendix B]. Awareness of risk reduction has become limited with scientific, academic and civil society associations like chambers of arcihects, planners and engineers (TMMOB). Despite, there is no consistency in attitudes toward risk reduction activities at legal and institutional levels. Only EMPI could achieve developing strategies for mitigation in metropolitan areas and local action plan areas, e.g. Zeytinburnu district of Istanbul, along with National Strategy of Reduction of Earthquake Losses. Despite, these plans and projects have not been implemented, yet. Local administration reforms and implementation of ISMEP Project continue to emphasise post-disaster activities instead of risk reduction, when recent unification of emergency management institutions also ignores 'risk reduction'.

In this context, local administrations cannot intervene in physical environment for avoiding and/or reducing earthquake risks, because such an intervention become restricted from all aspects as legal, institutional, technical tools (e.g. transfer of development rights) under insufficient inspection mechanisms and insufficient financial resources. In other words, physical plans in urban areas are still insufficient due to limitations of the Development Law (No: 3194) [Appendix B]. However, there has been also implemented no policy or strategy to encourage or force risk mitigation in terms of land-use policies, banking credits, technical supports or insurance incentives. .

2.3. URBAN RISK MITIGATION: THE PRIOR TASK IN TURKEY BECAUSE OF THE HIGH EARTHQUAKE RISK

Urban risk mitigation has to be prior in Tukey because of the high earthquake risk in the country. In other words, Turkey can confront big magnitude earthquakes like 1999 Marmara Earthquakes in the future because of the high earthquake probability and highly vulnerable building stock in the country. Firstly, Turkey is on the world's longest strike-slip (horizontal motion) faults. Among the numerous active faults, the most active and longest faults are the North Anatolian Fault (NAF) and East Anatolian Fault (EAF), when the most hazardous regions are North Anatolian, Marmara and Aegean Regions. Secondly, because 96% of population in Turkey is settled on earthquake hazard prone regions because of uncontrolled and rapid urbanization and the production of a most vulnerable building stock. When 98% of the population live at different earthquake hazard zones, 70% of the population live at the first-degree earthquake hazard zone. Approximately 75% of the nations' industry is founded in the two most hazardous zones.

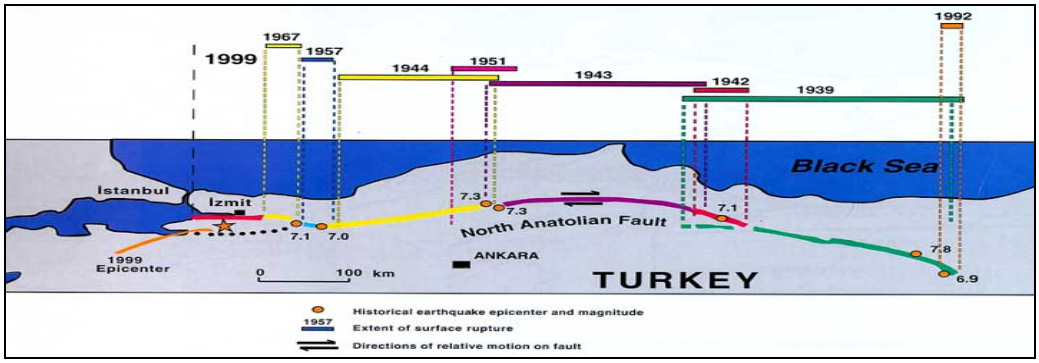


Figure 2.4. Time Profile of Earthquake Activity Along the NAF
(Source: GD-MRE 2009)

In addition, the sequential earthquakes on the NAF, especially 1999 earthquakes in the East Marmara Region, revealed the expectation of a large earthquake risk at a fault strand closest to Istanbul in the next 30 years (MMI ≥ VIII; ground shaking 0.34-0.65g) with the probability of 62±15%, in the next 22 years with the probability of %50±13 and in the next decade with the probability of 32±12% (Parsons et al. 2000). However, Istanbul is the greatest metropolitan city of Turkey, when 46% of the housing stock in Istanbul takes place in the first degree earthquake hazard zone, 42% takes place in the second degree earthquake hazard zone and 12% in the third degree earthquake hazard zone.

The main reason of the high vulnerability of housing stock against earthquakes arises from the rapid and uncontrolled urbanization processes in Turkey since 1950s. A major part of the population migrated from rural to urban areas, while cities had developed then more exposed to earthquake risk. On one hand, un-authorized housing stock, which constitutes a considerable part of the building stock in urban area as a result of insufficient housing supply and policies. This stock, which was developed as 'squatter' (gecekondu) areas at the beginning, had been legitimized through 'development amnesties' in time. Another part of this un-authorized stock is transformed into multi-story concrete apartments buildings. Since the development of this stock lack any investigation of the ground and construction, inspection of their risks are anticipated to be greater than the authorized stock. On the other hand, the risks in the authorized housing stock are also high. The lower interest in urban planning processes and monitoring mechanisms led to settle in earthquake hazard zones under land pressures, when the building stock is produced ignoring the building standards with real inspection.

As the concrete constructions constitute the major part of the building stock in Turkey, this stock became widespread in cities through 'observe and apply' (gör-yap) methodology neither as appropriate to the existing old urban tissue nor through the necessary urban plans in new development areas. In addition, there was insufficient knowledge and practice about the resistance of this concrete building technology against earthquakes. In fact, urban areas became the places of accumulated 'urban risks', because of the ignorance of the influence of land uses on each other. In some urban areas, there can be seen usages that produce, store and sell dangerous materials within the housing areas. For example, LPG and fuel product stations can be in the same building with the usages as wedding halls. These usages are not only dangerous during an earthquake, but also in daily life. However, there is developed any sufficient standart and any inspection for these usages (Balamir 2008).

2.3.1. Risk Mitigation has also Priority in the New International Policy

Natural disaster has long been dealt with conventional model of disaster management, which defines a cyclical process (disaster cycle), that identifies different stages or phases, i.e. mitigation, preparedness, emergency, recovery, that require different types of intervention (Balamir 2005; 2008). However, not only the number of reported natural disasters have become distinguishable, but also their gradually ascending socio-economic impacts on human and economic development has been increasing worldwide, particularly since the period of global economic growth in 1980s (UNDP 2004; Munich-Re 2006). Disaster impact assessments revealed that global economic losses in last ten years (1995-2005) were 6.6 times greater than 1960s (UNDP 2004) and the insured losses increased 24.8 times since 1960s (Munich Re 2006).

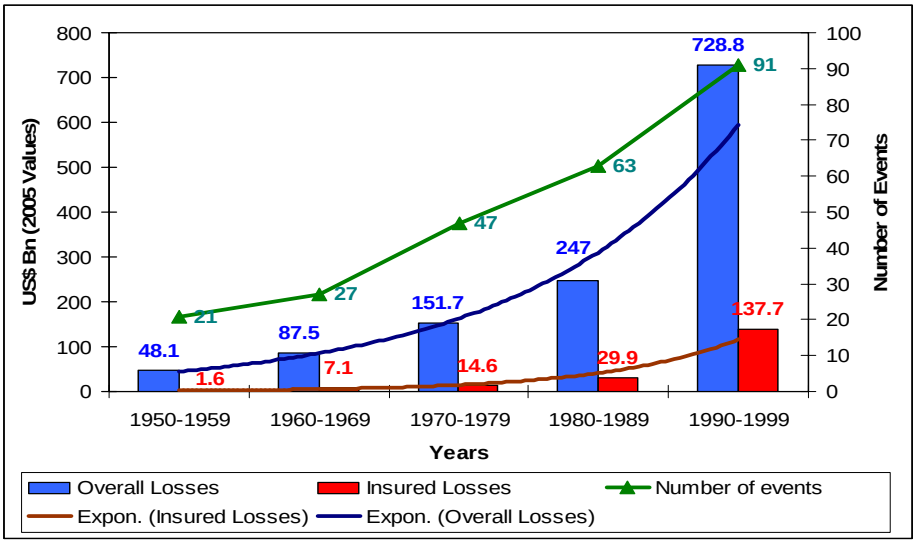


Figure 2.5. Economic Losses from Natural disasters in the World
(Source: Munich-Re 2006)

The confrontation with the increasing losses from natural disasters caused being aware of the limits of the conventional model of the natural disaster management. mitigation expenditures are recognized as a small fraction of the funds spent on reconstruction after catastrophes (Pollner 2000a: 44). This led to the recognition of the need to promote 'prevention' and 'mitigation' (Kreimer and Arnold 2000; IDB 2003) and that of the relationship between 'development' and 'disasters' (OAS 2004). This policy shift in the international arena toward 'natural disaster risk management' can be observed in terms of the declaration of a new approach that emphasizes pre-disaster activities since 1990's:

(1) 1990-2000: UN-International Decade Disaster Reduction (IDNDR);
(2) 1994: Yokohama Strategy and Plan of Action for a Safer World;
(3) 2000: UN- Millennium Declaration (International Strategy for Disaster Reduction (ISDR));
(4) 2002: Johannesburg Action Plan;
(5) 2005: UN-World Conference on Disaster Reduction in Kobe and Hyogo Declaration;
(6) 2005-2015: Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters.

This policy emerged with the UN General Assembly that proclaimed the 1990's as IDNDR, which aimed the creation and maintenance of a safe environment through reducing the loss of life, property damage, social and economic disruption caused by natural disasters such as earthquakes, windstorms, tsunamis, and floods, especially in developing countries. In this new approach, the emphasis were made on relationship between 'risk', 'natural disasters', and 'development', as well as the 'pre-disaster activities' such as 'prevention', 'mitigation' and 'preparedness' (IDNDR 1990), using a new therminology [Appendix C]. This approach has an agenda that integrates 'natural disaster risk management' and 'development' in the frame of 'sustainable development' for creating resilient societies (IDNDR 1990).

This new international policy approach emphasises a comprehensive Natural Disaster Risk Management (NDRM) through which the pre-disaster risk reduction or mitigation can be implemented (Gilbert and Kreimer 1999; Kreimer and Arnold 2000). NDRM is involved with three public policy strategies to be undertaken before, during and after disasters (IDB 2000), but focuses on the ex-ante activities that should be taken before disasters strike. NDRM begins with 'risk identification'[10] for the adoption of adequate and successful disaster reduction policies and measures (Kreimer et al. 1999; UNISDR 2004). Risk reduction, i.e. mitigation, addresses structural and non-structural regulations and policies to reduce the physical hazard and vulnerabilities (Burton et al. 1978; Blaikie et al. 1994).

In risk reduction, the priorities must be taken in a sequence of "avoidance" and "minimization" of risks (Kreimer et. al. 1999; Burby 1999; Balamir 2001b). Avoidance of risks is involved with settling on the resistant areas that is given to the land-use planning and implementations, and therefore urban planners and local administrations [11]. Minimization of risks is the second set of tasks to be undertaken in infrastructural networks and the design and production of buildings such as houses and businesses, which is met by architectural and engineering services [12]. Having accomplished both of the former steps, the remainder unavoidable risks are to be shared (risk transfer/ share) between the members of the society (Balamir 2001b) [13]. In addition, NDRM incorporates post-disaster activities

such as ‘emergency response’, ‘rehabilitation’ and ‘reconstruction’ to lessen the impacts of current disasters, while avoding to rebuild vulnerability (IDB 2003).

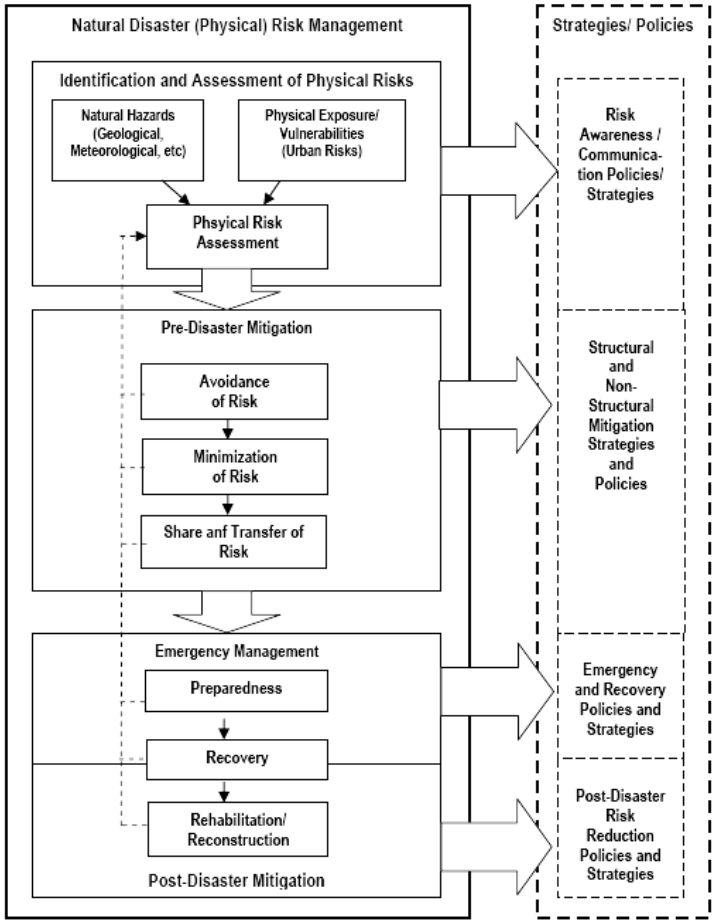


Figure 2.6. Natural Disaster Risk Management
(Redrawn by the authors, Sources: Balamir 2001b; Burton et al. 1978; Blaikie et al. 1994 ; Godschalk et al. 1998)

The new international policy approach supposes the ‘failure of development’ as the main reason of increasing human and economic losses from natural disasters (Yokohoma 1994). Therefore, disaster risk reduction can contribute to ‘sustainable development’ [14] through reduced losses and improved practices, whereas disaster risk is involved with unsustainable elements [15]. From this perspective, ‘urban planning’ is given the prior role for risk mitigation through sustainable development, because ‘avoidance of risks’ has the foremost priority and has largely to be maintained by means of renewed

'land-use planning' practices and regulations. In other words, the losses from natural hazards can be reduced in terms of creating resilient communities (UN/ISDR 2000).

Indeed, urban planning is a powerful tool for reducing losses and increasing the resilience of a community in affecting the location and the design of urban development as well as long-term community sustainability (Burby 1999; Godschalk et al. 1998; Burby et al. 2000). Therefore, what sustainability framework introduce to urban planning is the given task of reversing the technical, socio-economic and political failures in development process or urbanization (Berke 2002).

Depending on the three Es of sustainable development, the emerging 'triangle of planner' is involved with the economy, society and environment and has to balance the three goals of growth in the economic development, social equity in the distribution and environmental protection [16]. Moreover, planners have to solve the property, resource and development conflict [17] (Campbell 1996). In this framework, the society is linked to environment (natural and built) with the impact of risk, i.e. the level of vulnerability or resilience, when mitigation measures should have efficacy, i.e. the degree to which adjustments reduce the hazard risks (Lindell et al. 1997). Therefore, the society is linked to economic context with the constitution of 'financial resources' to be able to invest in built environment, when the application of mitigation measures addresses the balance between economic development and 'efficiency' of environmental and financial resources regarding the 'cost' of technical measures. Simultaneously, their application and the use of financial resources should address 'social equity' (social effectiveness, fairness, justice).

In this framework, the prior necessities for creating a resilience society through urban planning can be achieved in terms 'integration of hazard mitigation into urban planning', which can be achieved through production of 'urban risk maps', 'including risk reduction policy instruments into urban plans' and 'monitoring urban plans, programs and constructions practices' [Appendix C]. To achieve these necessities, 'socio-spatial capacities of local administrations and other stakeholders' in the society should be enhanced through 'direction of resources into risk mitigation'. In other words, the priority to use financial resources is given to risk mitigation activities, while the compensation of losses is also critical after disasters. Constitution of financial resources is necessary at the institutional level, when the contribution of society at collective base becomes important (Yokohoma 1994). In addition, the new organization model attempts to apply bottom-up, proactive, cascading threshold, cooperative model and standardization of knowledge for building and strenghten the capacities/ resilience at human, institutional and local level in terms of local adoption of mitigation measures and preparedness (Yokohama Strategy 1994; Hyogo Framework 2005).

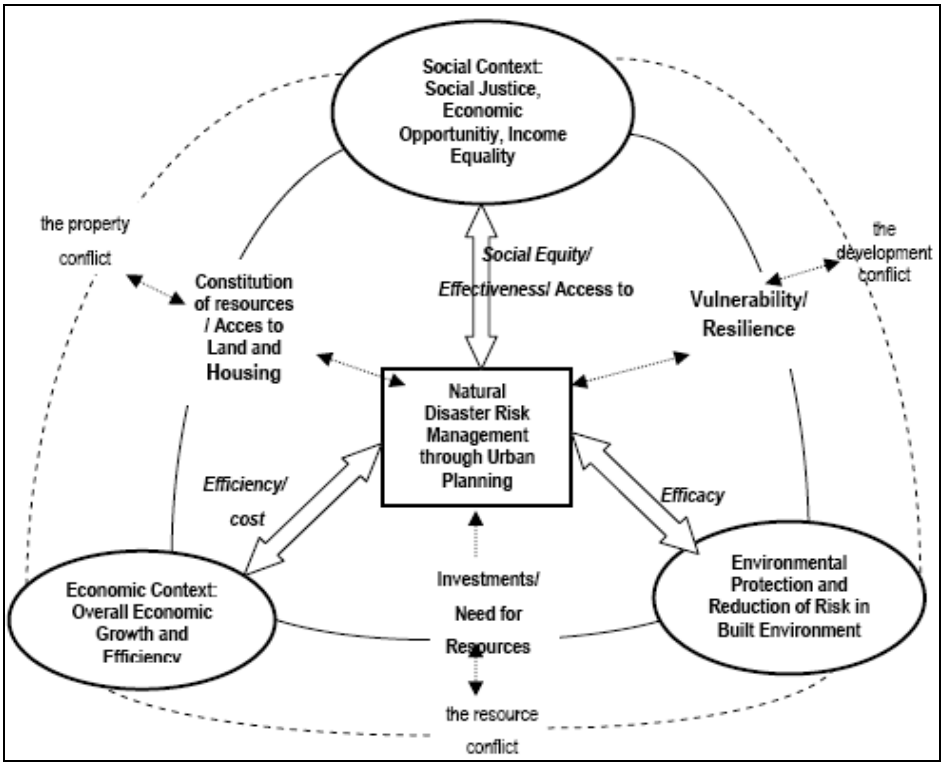


Figure 2.7. Planners' Triangle for Sustainable Natural Disaster Risk Management
(Redrawn by the authors, Sources: Campbel 1996; Lindell et al. 1997; UN/ISDR 2004)

2.3.2. The ZDS System was the milestone of the World Bank from the New International Policy Perspective toward risk mitigation and management

The ZDS system in Turkey is established by the assistance of the World Bank from the new international policy perspective to direct investments into risk mitigation and to finance disaster losses. That is, the ZDS system was among the components of the MEER Project of the World Bank after the 1999 Marmara Earthquakes. The MEER Project was dealt with 'building a sustainable national emergency management response system as a way to reduce the impact of future earthquakes', 'establishing a disaster insurance scheme', 'improving land use management and enforcement of building codes', and 'reestablishing normal living conditions in the affected areas by constructing new permanent housing' and 'supporting a trauma program for adults' (Wilczynski et al.1999). In fact, both the MEER project and the launch of the ZDS system have addressed a new beginning in the history of the World Bank, because this lending of the Bank emphasised "innovative and forward-looking measures to reduce future economic losses through better risk management and mitigation efforts":

> "The insurance program supported under the MEER, is an important part of a comprehensive institutional reform program, which also supports the government efforts in strengthening national emergency preparedness and response systems, and improving the enforcement of construction code." (World-Bank 2000).

The ZDS system is modeled after the California Earthquake Authority and New Zealand Earthquake Commission Programs by the World Bank. These natural hazard insurance programs provide similar earthquake coverage for homeowners and rely mainly on international reinsurance and capital markets for their risk capital capacity (World Bank 2000). However, the technical assisstance of the World Bank in financial issues is not observed in the constitution of risk mitigation mechanism through the ZDS system (Gurenko et al. 2006). Indeed, the Bank also recommends the establishment of the public-private insurance pools in the MLICs to contribute into risk mitigation in the frame of a comprehensive natural disaster management (Gurenko 2004). The World Bank attempts to establish similar public-private insurance pools in countries like Mexico, the Caribbean and Central America (Pollner 2000b). This attempt of the Bank arises from the distinguishable differences in the socio-economic impacts of natural disasters between the HICs and the MLICs [18]. Although implementing hazard insurance in market is difficult in MLICs countries (UN/ISDR 2004) [19], public-private insurance pools, which are already created by the HICs, can be constituted by the government intervention in insurance markets in MLICs (Andersen 2005:13) [20].

2.4. CONCLUSION: EXPECTATIONS FROM THE ZDS SYSTEM IN TURKEY

Being exposed to earthquakes and vulnerable urban areas to earthquakes causes the rise of the necessity to deal with earthquake risk through pre-disaster 'risk mitigation' activities. As observed in the international policy shift, Turkey needs to introduce natural disaster risk management (NDRM) practices with the regulation of land use and building construction that are described within the Development Law (No. 7269). However, implementing NDRM seems to be dependent upon regulating a broad range of areas, including property taxation and management, building insurance, establishment and operation of voluntary community organizations. That is, 'mobilization of all national and international' sources for risk mitigation. The ZDS system was established with this objective to promote safer construction of buildings by using insurance techniques. Particularly, determination of ZDS premiums based on risk-rated premiums could promote risk reduction. However, the ZDS system could not accomplished its aims, when the State continues to offer post-disaster housing assistance.

Despite, the expectations from the ZDS system continues depending on the necessity of risk mitigation in Turkey. According to Gülkan (2001), the ZDS system could encourage adoption of

mitigation measures in terms of taking the lead in developing guidelines of safer building construction. According to the report of the National Earthquake Council (UDK 2002), Turkey needs to constitute substantial resources to mitigate the earthquake vulnerability of urban areas, when the source of the ZDS system seems to meet this necessity in the case of its contribution to risk mitigation activities. Kunreuther et al. (2004: 125-127) claimed that the ZDS system could encourage homeowners if it could offer risk rated premiums as linked to the risk mitigation credits. According to Balamir (Balamir 2004a; 2005), the ZDS system could encourage homeowners for risk mitigation through risk rated premiums, when the ZDS system could be integrated into a NDRM framework, which requires its collaboration with the local and central administrations.

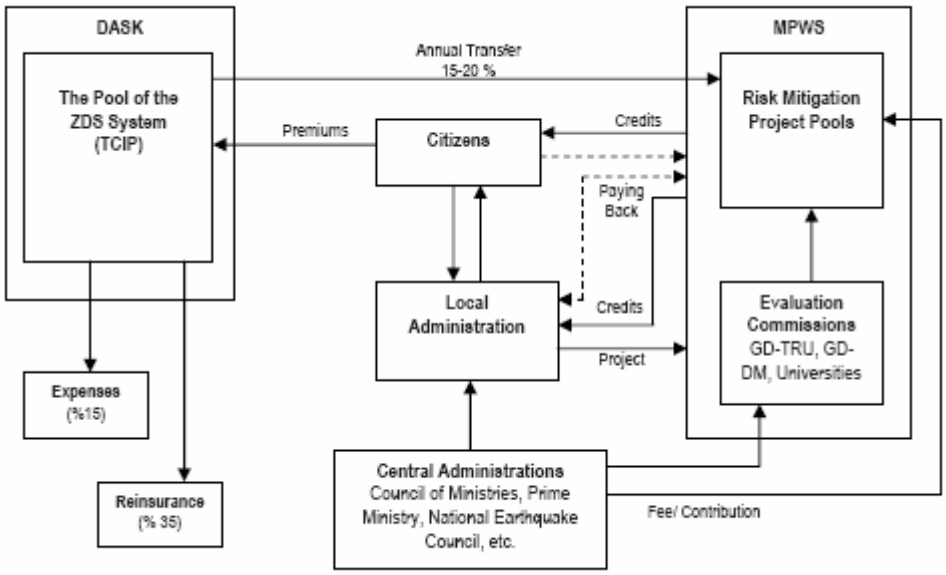


Figure 2.8. The Management of the ZDS system with the Risk Mitigation

(Source: Balamir 2004a)

Similarly, the World-Bank recommended the integration of the ZDS system into a comprehensive NDRM framework to prevent its dependency on the reinsurance markets (Gurenko 2004). According to Kunreuther et al. (2004: 126-132) risk mitigation could also reduce the reinsurance costs of the ZDS system. The calculation of the Exceedance Probability curves for 30 buildings reveals that the actuarial risk of the ZDS system without risk mitigation in these buildings would be around $ 16.179, when this risk would be reduced to $ 3.507, if the risk of these buildings were mitigated. Therefore, the TCIP would save nerly $19.008 from its reinsurance costs. This means nearly 75% of its reinsurance costs, if the risks could be mitigated extensively.

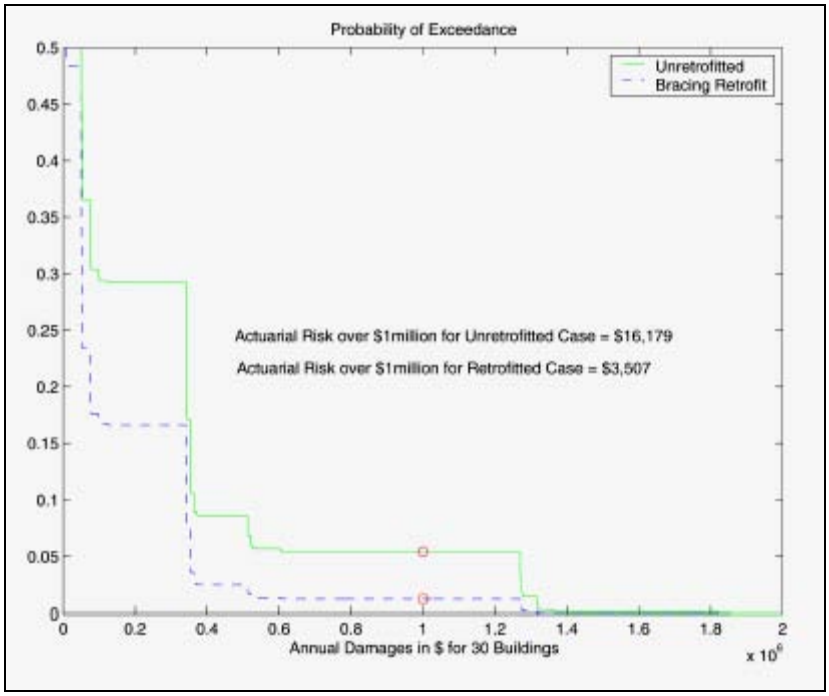


Figure 2.9. Exceedance Probability Curves For Block of 30 Buildings Without and With Braced Retrofitting

Based on these discussions, the next Chapter of the dissertatation aims to investigate the insurance techniques and national experiences with hazard insurance, from the new international policy perspective. Findings of the next Chapter could be used to evaluate whether the current ZDS system can create resilience against earthquakes and alternative policy options to use the ZDS system for risk mitigation.

[1] Turkish Republic is prone to natural disasters such as earthquake, flood and landslide due to its geological, topographical and meteorological characteristics. Among these, earthquakes have significant impacts. Thus, earthquakes have caused greatest loss of lives and damages in built environment than other natural disasters. Evidence from impacts of five decades reveals that, earthquakes caused 90% of loss of lives, when 61% of buildings are damaged during earthquakes. Share of earthquakes in total housing damage from natural disasters rised to 76% in 2005 (Özmen et al. 2005). Since 1900's, 97.200 people lost their lives, 175.000 people were injured, when 583.371 buildings were heavily damaged or collapsed in 158 earthquakes (Taymaz 2001). In the average, one earthquake occurred in every eight months causing high damages. Put in other words, 4.204 houses collapsed and 664 people lost their lives each year (Özmen and Nurlu 1999). Between 1900 and 2009, the number of affected people from 71 earthquakes is anticipated as 6.874.596 (96.825 persons per event), when 88.538 people lost their lives. In this period, nearly 1.160.880 people lost their homes due to earthquakes (ISDR - EMDAT 2008/2009/). Between 1974 and 2003, the average number of disaster victims (loss of lives and being influenced) in one year amounts 53.5 per 100.000 people, when the average victim per 100.000 people in Turkey amounts 186.4 (Sapir et al. 2004). Big magnitude earthquakes occurred on NAF in an historical and adjacent manner from 1939 Erzincan until 1999 East Marmara Region Earthquakes.

[2] The financial resources that constituted the fund were the annual allocation of the MPWS, charitable institutions, public and private institutions and monetary aids of individuals, Economic State Agencies (İktisadi Devlet Teşekkülleri - KIT), 3 % of the balance sheet profits of the banks and institutions whose at least 50% was owned by the state, the repayments of the loans and interests, the interest of the money in the fund, the income from the buildings that are constructed by the state and sold by Emlak Bank for disasters.

[3] Other resources that were used in natural disasters, i.e. Civil Defense Fund and Social Aid and Solidarity, were also closed because of same reasons. Compensation of losses was transferred to the annual budget of the State.

[4] According to Treasury, there were 665.870 fire and engineering insurance policies that included earthquake peril, while these policies amounted US$ 102 billion, in all Turkey in 1999. 41% of these policies (nearly 266.000) were in charge in Istanbul, Kocaeli, Adapazarı and Yalova. Value of insured industries was anticipated as US$ 15 billion (Bibbee et al. 2000) and total economic loss in industries as between US$ 1.1 and 4.5 billion (SPO 1999). Milli Reinsurance Company declared that value of insured properties was around US$ 1.68 billion (EQE Briefing 1999). Insured industries required 205 billion TL (US$ 460 million) compensation. This amount increased into 750 billion TL (US$ 502 million) with compensation of losses that arised from business/ interruption. However, total annual insurance accumulation amounted nearly US$ 72 million at that time (Selçuk et al. 2001), when World Bank assessed total insurance reserves of insurance companies that are involved with earthquake as nearly US$ 27 million (EQE Briefing 1999). Due to this insufficient insurance capital in private insurance companies, companies could only pay 10% of insured losses from their company budgets, while 90% of insured losses are paid by reinsurance companies (Selçuk et al. 2001). In earthquake region, where total insurance protection amounted 42 billion TL (Bibbee et al. 2000), 11.500 insurance policies that belong to damaged properties were informed to Milli Reinsurance Company (Selçuk et al. 2001).

[5] Between 1904 and 1939, earthquake insurance was supplied as an allied peril in fire insurance. In 1939, it was excluded from fire insurance because of the huge losses in Erzincan Earthquake. It was again included to the security coverage in 1960. With free market tariff in the insurance industry in 1990, the earthquake insurance policy prices decreased in spite of high risk. Although earthquake insurance was available in the market for voluntary purchase in Turkey. Sequential earthquakes in 1993 led the Treasury of Turkey to determine a certain tariff for earthquake insurance and to search ways for making earthquake insurance compulsory (Selçuk et al. 2001).

[6] Totally, 52.000 buildings were damaged and 70% of them had small and moderate damages, when 25% were heavily damaged; and 45% (23.400) of the damaged buildings could not be re-used. In addition, 75% of these damages were experienced in the Kocaeli Earthquake (Erdik 2001).

[7] Its focus was on individual buildings and neglect widespread abuses in construction industry, delegating municipal building regulation development to private firms, failing to link construction regulation to macro-economic policies, and not involving professional organizations during construction control. Another critiques was on the concepts such as 'building inspection firms', 'certified architects', and 'certified engineers'. The decree was discussed as creating 'a privileged professional group' that breach constitutional principle of equality.

[8] Building inspection firms were defined as private firms to be established by eligible architects and engineers with the aim of supervising projects and construction activities and reporting to local authority that is responsible for issuing construction and occupation permits.

[9] The members can be the representatives of institutions such as Prime Ministry, Under secretariat of the Treasury (General directorate of Insurance), Ministry of the Public Works and Settlements, Capital Markets Board, The Association of Insurance and Reinsurance Companies of Turkey, Operational Manager Company of DASK and an academic person with background and experience in one of the related fields (as civil engineering, geophysical engineering, geological engineering or equivalent).

[10] Risk assessment requires hazard and vulnerability assessment to estimate potential loses, which provides the basis for risk reduction activities for public and private decision makers. Such models are used for development plans, evaluate options for mitigation or risk reduction investments, and plan for response needs before a disaster occurs. With the evaluation of cost and benefits for mitigation expenditures, the strategies are developed to strengthen or replace the vulnerable structures and infrastructure. Investors and insurance companies are, then, able to evaluate the security of their investments and the extent of their exposure to disaster risk (Kreimer et al. 1999).

[11] In this way, *avoidance* can prevent the occurence of the risks, especially in the case of earthquake risk, because the land-use planning can provide to settle in the earthquake resistant areas. In addition, distancing, can specify minimum distances from the nodes of hazard, e.g. earthquake faults. Moreover, refusal can provide prohibiting existing uses with high risks and source of chain-disasters. Through urban planning, safer decisions can be taken for site selection, land-use and locations for the development of infrastructural networks and building investments. Urban planners, however, are required to work with the geologists and geophysical engineers during their land-use plan and location decisions (Balamir 2001b).

[12] Risks can be discarded at source through flood reservoirs and induced avalanches or land-slides. Moreover, resistance can be upgraded at location of effect in terms of higher standards in design and construction, inspection of construction, and building-retrofitting services (Balamir 2001b; Mileti 1999). However, risk reduction in the existing structures may be difficult to relocate and expensive or impossible to reinforce (Kreimer et al. 1999). The priority in the risk reduction can be given to the buildings or infrastructure that can be used during the emergency public buildings (Balamir 2008).

[13] That is the share of the burdens of post-disaster relief (Tierney et al. 2001). The share of risk can be in an organized form with sustainable financial resources.The professional services of the experts in finance, public administration, public relations are to meet this final task for the distribution of resources in terms of aids and subsidies (credits, rent subsidies for dwelling and business premises), donations (national/ international, voluntary/ organized, cash/ in kind donations), extra-taxes (extra burdens on others than those suffered losses in the disaster) and insurance (Balamir 2001b). Particularly, risk transfer through insurance and reinsurance is an important policy tool in the developed world to address the cost of natural catastrophes (Freeman 2000; Mileti 1999).

[14] The Brundtland Commission (WCED 1987) described sustainable development as 'development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs'.

[15] When sustainability is presented at the intersection of environment, society and economy contexts (Giddings et al. 2002), the three Es of sustainability, i.e. Environment, Economy and Equity, can be achieved in terms of reversing the negative effects of development in these three contexts. Therefore, the physical, social, economic, and environmental vulnerability can be reduced in the social, economic and environmental contexts of sustainable development. That is, risk reduction requires the technical interventions through land-use planning, retrofitting of buildings, flood control techniques and financial resources, on one hand (UN/ISDR 2004). On the other hand, their implementation addresses the on-going socio-economic processes to decrease vulnerability and increase resilience through enhancing local capacities (El-Masri and Tipple 2002; UN/ISDR 2004).

[16] The economic development aspect is involved with the production, consumption, distribution and innovation of wealth, when the city is in competition with other cities and markets. The environmental aspect addresses the city as a consumer of resources and a producer of wastes, when the city threats the scarce resources and land of the natural environment. The social aspect addresses the city as a location of conflict over the distribution of resources, of services, and of opportunities, when different social groups are in competition within the city (Campbell 1996).

[17] Property conflict addresses the conflict between economic growth and equity and arises from the competing claims and uses of property by differing social classes in society. When property is defined as private, e.g. housing and land, in a capitalist society, its existence also rely on government intervention through land use planning, e.g. zoning or public housing to ensure the beneficial social aspects. Therefore, property conflict addresses the boundary between private interest and the public good. Resource conflict addresses the conflict between environmental resources and economic growth. While business resists the regulation of its exploitation of nature, it also needs regulation to conserve those resources for present and future demands. The development conflict arises from the difficulty of economic growth in the case of increasing social equity and protecting the environment simultaneously (Campbell 1996).

[18] The economy of HICs is not influenced from natural disaster losses profoundly in spite of experiencing more economic losses than MLICs, when their resilience depends on using 'insurance' as an ex-ante risk financing tool so that they increase their financial resilience at a collective base (Mahul and Gurenko 2006; Munich Re 2000a). About a third of high-income countries are insured against natural disasters (Gurenko and Lester 2004; Gurenko 2004; Mahul and Gurenko 2006), whereas insurance has a very low penetration ratio (0-10%) in developing countries (Munich Re 2000b; 2007). Due to lack of insurance systems, the disaster losses in these countries cannot be absorbed by the governments and insurance markets as well as by the international donors, such as the World Bank (Pollner 2000a). The natural disasters in MLICs like Hurricane Mitch in Honduras and the 1999 Marmara Earthquakes in Turkey caused considerable losses (Gurenko 2003).

[19] The constraints emanate from higher physical, social and economic vulnerability levels of MLICs and the low capacity of

the insurance industry to absorb the catastrophic losses. Many structures in these countries are 'uninsurable' due to being located in hazardous settlements and constructed as vulnerable against natural hazards. The high vulnerability of the physical environment and their highly correlated characteristic makes it difficult to implement private insurance techniques. Therefore, the industry can be limited to offer affordable premiums, whereas low income level of households cannot access to the expensive premiums (Andersen 2005:27).

[20] Offering insurance policies to public by the State can be a policy for major catastrophe risks – uninsurable risks in the market- through creating national insurance pool. If this kind of insurance protection can operate as an independent economic entity, the politicization of interferences in claims distribution can be prevented (Andersen 2005: 30).

CHAPTER 3

CAN NATURAL HAZARD INSURANCE BE USED TO PROMOTE RISK MITIGATION? WHAT ARE THE INSURANCE TECHNIQUES AND NATIONAL EXPERIENCES IN THE WORLD?

The insurance techniques can be used for risk financing and mitigation. However, insurers in High Income Countries (HICs) around the world could confront difficulties to insure natural disasters because of the increasing catastrophic losses, when the preferred techniques can cause social exclusions and continuity of the State-aid as well as reluctance for risk mitigation. Because of the un-insurabe attribute of natural disaster risks in the market, insurers are also criticized by the 'risk theory theory' as becoming limited in dealing with the contemporary risks. On the other hand, Medium-Low Income Countries (MLICs) suffer from increasing natural disaster losses more than the HICs, due to their lack of a well-developed insurance industry to absorbe catastrophic losses, when their citizens also lack insurance culture. Although insurers attempt to find out innovative ways, i.e. public-private insurance pools, applying sole insurance techniques seem not to result in resilient of the societies, particularly MLICs. Sustainable risk mitigation could require complementary polilcies and strategies to implement natural hazard insurance in the MLICs, like Turkey.

3.1. OPPORTUNITIES OF INSURANCE TECHNIQUES AND RISK MITIGATION

The aim of insurance is to reduce the financial uncertainty of risks that individuals or institutions face and to 'protect against the loss of capital' (Ericson et al. 2003:48). To serve its aims and objectives, insurance, creates an 'economic system' since it reduces the uncertainty through risk transfer, pooling of premiums and redistribution of compensations (Bickelhaupt and Magee 1970:26) [1]. Insurance can also be accepted as an 'actual system of applied mathematics', since it applies certain actuarial principles such as low of probability and statistical techniques. That is, the technology of insurance provides reducing financial uncertainty and it applies basic techniques such as 'risk assumption', probability', 'the law of large numbers' and 'pooling', which requires the calculability of risks. (Bickelhaupt and Magee 1970).

However, insurers attempt to cover incalculable and uninsurable risks through increasing their capacity to cope with catastrophic losses and in terms of certain techniques. The law of large numbers provides to apply insurance techniques and decreases the information asymmetry problem, which can be achieved through high penetration ratio of insurance pools (Priest 1996; 2003). In addition, financial risk reduction techniques are used to prevent the problems. In addition to risk transfer techniques such as re-insurance, insurers can 'monitor' and 'control' the risks to prevent the 'information asymmetry problems', i.e adverse selection and moral hazard, and to provide accurate risk estimation (Kunreuther 1998).

Another technique to prevent information asymmetry problem is offering 'contractual methods'. This technique also provides the selection of risks and substantial decrease in the compensation of losses (Kohler 1982; Li 1998). As a result of the increasing number of low-risks in the insurance pool, the ratio of high risks in the pool diminishes and provides the efficient work. Using contractual methods, e.g. 'coinsurance' and 'deductible' programs (Kohler 1982), people are rewarded for 'loss prevention'. Therefore, fair risk-rated premiums attract low-risk people and provide incentives to encourage high-risk people for risk mitigation (Priest 1996; 2003). Designing contractual methods requires implementing risk-rated premiums through accurate 'risk classification' (Li 1998). To classify the risks, insurers 'aggregate' and 'seggregate' risks [2]. Therefore, they reduce the financial risk of the insurance pool and improve the composition of insureds (Priest 1996; Schwarze and Wein 2005) due to actuarially fair risk–rated premiums (Hoy 1982; 1984).

In this way, insurers can select good (low and uncorrelated) risks through diversifying their portfolio (Linerooth-Bayer et al. 2003) and identically valued (similar) risks (Athearn 1969: 39) as well as to exclude bad (incalculable and uninsurable) risks (Ericson and Doyle 2004: 138) in terms of limiting the location or prohiting some kind of risks to insure (Athearn 1969: 39). In turn, the increasing rate of low-risks in the pool decreases the average price of insurance and enhance in the 'social welfare' (Schwarze and Wein 2005). Hence, these techniques makes insurance also a 'social device' in which the losses of few are paid by many. Insurance manages risks that threats a population and can be audited in space and time, if there is a 'collective interest' or 'collective well-being'. In addition to the large pools, promotion of risk mitigation leads 'social solidarity'. In addition to contract conditions, insurers also increase risk awareness through risk communication strategies such as education campaigns (Ericson et al. 2003: 5-47). Moreover, insurance creates 'a social technology of justice' through 'distributive justice' (collective sharing of loss) and 'restorative justice' (financial indemnification) (Ericson et al. 2003: 5). In terms of its justice, insurance transforms and bridges individual responsibility to collective or social responsibility (Ewald 1991: 206,7; Ericson et al. 2003: 5).

However, if insurers lack 'perfect information', emerging adverse selection problem can threat the efficiency of the pool due to increasing proportion of high risks (Hoy 1984). On the other hand, classification of risks imperfectly can cause two problems that are related to inequality: discrimination in insurance policies (Schwarze and Wein 2005) and inability to seperate correlated risks (Hoy 1982). These can also cause to make people in low risk category better off whether they are correctly classified or not, when the people in the high-risk category can be made worse off whether they are correctly classified or not (Hoy 1982).

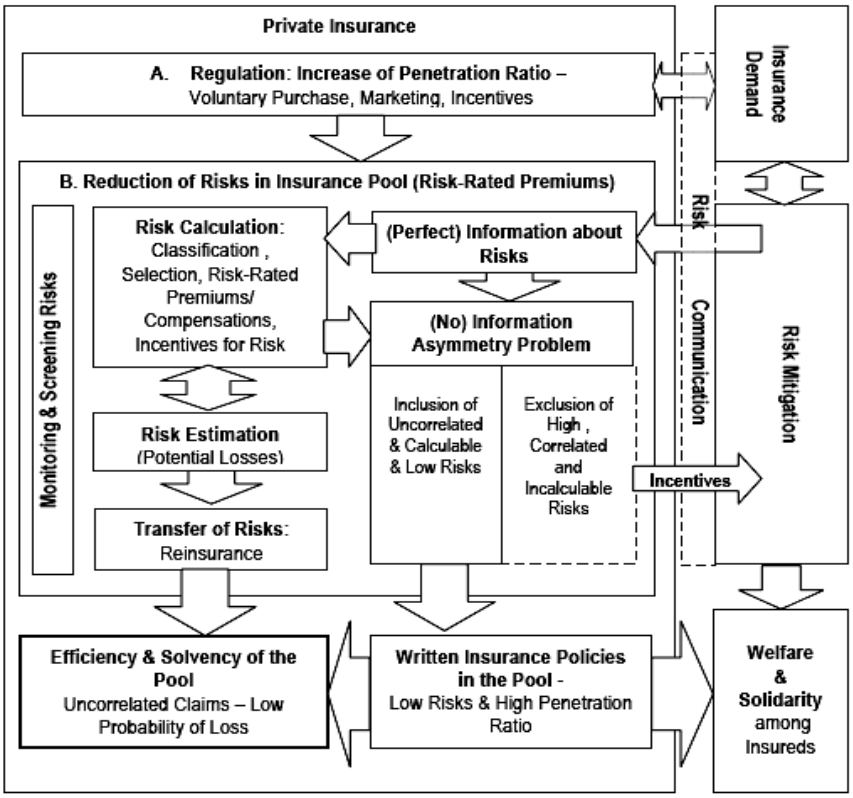


Figure 3.1. Mechanism of Insurance Companies
(Drawn by the Authors, Sources: Priest 1996, 2003; Kohler 1982; Linerooth-Bayer et al. 2003; Athearn 1969; Kleindorfer and Kunreuther 1999)

3.2. DIFFICULTIES OF INSURANCE INDUSTRY TO INSURE NATURAL DISASTER RISK

Due to increasing catastrophic economic losses in natural disasters, private insurance companies confronted difficulties in paying compensations and become insolvent (Ganz 1998; Li 1998; Athearn 1969) [3]. Since the losses were underestimated significantly, insurers could not pay the claims that raised from the damages of hurricanes in Florida and of earthquake in California (Kunreuther 1998). For the efficient work of private insurers, they have to compare their capacity and the risks in their portfolio. However, there are difficulties to calculate and estimate natural disaster risks depending on the characteristics of natural disaster risks as:

a) Low Probability/High Consequence Events: Major natural disasters seldom occur, but when they do, catastrophic consequences follow. Because the limited number of past events and the difficulty in accurately predicting future events, insurers confront problems in the evaluation of risks.

b) Uncertainty and Incalculability of Risks: Natural hazard risk is ambiguous and unpredictable. There is a difficulty in identifying what losses may occur. Although insurers utilize the risk assessments of experts, these estimates are highly uncertain and ambiguous (Li 1998). Since insurers rely on historical data that is usually absent for the low probability- high consequence attributes of natural disasters due to the interaction of technology and environment in the construction of urban areas (Kunreuther 2001; Li 1998) [4]. Due to lack of information, insurers can not estimate the expected losses. As a result of underestimation of losses, insurers and reinsurers suffer from natural disasters. For example, insurers could not pay the claims that arised from the damages hurricanes in Florida and earthquake in California (Kunreuther 1998).

c) High Correlation of Claims from a Single Event: An insurer confronts the problem of highly correlated claims, if it provides a single coverage, e.g. earthquake coverage, only in a single area, e.g. Los Angeles, instead of diversifying (Kunreuther 1998). Because natural disasters such as earthquakes are *geographically focused* events, when one occurs many claims are concentrated in a single area and at the same time. In these situations, when the dependent risks happen, insurance companies have to compensate tremendous losses and suffer from catastrophic financial losses that arise from one single event (Athearn 1969; Ganz 1998; Kunreuther 1998).

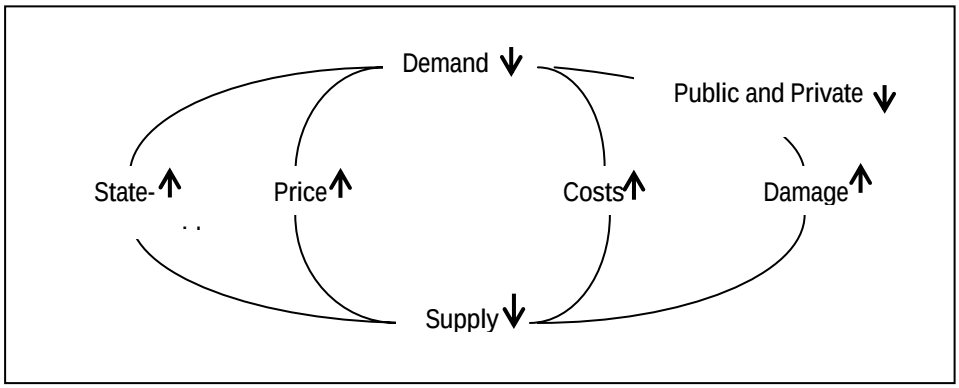


Figure 3.2. The Disaster Syndrome and Insurance
(Source: Schwarze and Wagner 2007)

The 'disaster syndrome' of private insurance for natural disasters as described by Kunreuther (2000) displays a structural model that explains the main factors take role. When there is a lack of demand, supply has high costs. Due to the risk of catastrophic losses, insurance premiums that are offered by companies have high prices, particularly if the risks are uncertain and there are information assymetry problems (Kunreuther 1998; Linerooth-Bayer et al. 2003; Ganz 1998; Li 1998; Athearn 1969). To prevent the information asymetry problems and to provide accurate risk estimation, insurers can monitor and control the risks. However, monitoring and controlling of risky behavior and adverse selection is extremely difficult for an insurer once a person is insured. Moreover, the collection of information to distinguish the risks requires for an insurer to invest considerable expenses (Kunreuther 1998).

This treatment of insurers arises from being risk averse since they want not only cover the expected losses, but also to protect themselves from experiencing catastrophic losses (Kunreuther 1998). In the natural disasters, due to tremendous losses from a single event, insurers are uncertain to offer many policies in an area facing the same hazard, when some insurance companies do not offer insurance for natural disasters, because they see natural disaster risks 'uninsurable' and 'non-marketable' (Kunreuther 1998; Linerooth-Bayer et al. 2003; Ganz 1998; Li 1998; Athearn 1969; Mileti 1999). For example, after the 1994 Northridge Earthquake in California, due to the insolvency threat from another earthquake, insurers that represent 96% of homeowners in the insurance market restricted or refused to insure against earthquake, although insurers were obliged to offer coverage according to law (CEA 2008). Similarly, in Florida insurers have withdrawn from the flood and earthquake insurances (Li 1998).

3.2.1. Do the Limits of Insurance Indicate the Transformation toward Risk Society?

The world-risk society theory of Ulrich Beck claims that broad socio-economic and political changes in late modernities led not only the human progress in technology, science and development (Beck 1992b:20-21; Beck 1996:31). This unforeseen face of modernity, i.e. changing characteristics of contemporary risks, is discussed as representing the harbinger of entering into a new phase in human history as 'risk society' (Beck 1996:31) [Appendix D]. However, the mechanisms used to cope with risks in industrial society have also become limited to deal with, measure and manage these these risks (Beck 1996:31; Beck 1992b:21; Beck et al. 1994:6). Particularly, 'insurance' become limited to deal with the contemporary risks, i.e. natural and technological catastrophes, when the 'limits and constraints of insurance industry' becomes the key indicator of the transition into 'risk society': (Beck 1996:31; 1992b:21):

> "Anyone who inquires as to an operational criterion for this transition has it to hand here: the absence of private insurance cover. ... Industrial society, which has involuntarily mutuated into risk society through its own systematically produced hazards, balances through the insurance limit…. It is the insurance companies which operate or mark the frontier barrier of risk society." (Beck 1996:31).

The limitation of insurance industry arises, firstly, from the 'economic rationality of modernity' (Beck 1996: 31-32). The industrial society was a 'residual risk society' (Beck 1992a:101), where 'the risk calculation' and 'insurance' techniques were developed as the fundemantal risk management techniques (Beck 1996:31). However, risk society is a 'catastrophe society' (Beck 1992b:24), because of incalculability and uninsurability of new risks. Being low probability and high consequence prevents to calculate, account actuarially and insure these risks, including natural disasters. Hence, although safety managers assess the technical risk as low probability, insurers are reluctant to insure new risks, because of their catastrophic economic consequences and the insufficient capital of insurance industry to compensate them (Beck 1996: 31-2).

Secondly, the financial compensation of insurance is not an appropriate solution for 'unreplaceable losses' and 'systematic, irreversible and invisible harm of risks' (Beck 1992a; 1992b; 1996). It is not the economic rationality that prevents to implement the principles of insurance for the worst imaginable cases, e.g. nuclear power plants, but also due to the medical, psychological, cultural and religious senses. "Beck's message is an important one: insurance cannot replace the loss of loved ones nor one's treasured environments and personal effects" (Ericson and Doyle 2004:138-9). Insurance only distributes the capital loss risks and offer financial compensation after the event, which

is not any more than ‘disaster relief funding’ that use taxation and other devices (O’Malley 2003:276). For this reason, the early industrial society, which was a residual risk society, is transformed into an ‘uninsured society’ (Beck 1992a: 101) and an ‘uncovered society’, although it is a fully insured society (Beck 1996: 37).

3.2.2. Does the Insurance Industry transform itself in a self-critical way?

Insurance companies react to natural disaster risk differently. In general, four trends can be observed. First, insurance companies uses innovated market instruments for risk transfer such as derivatives and catastrophe bonds. Second, insurance industry uses specialized risk estimation methods in some countries e.g. Austria, Belgium, Germany and United Kingdom [5]. These new techniques are used to estimate risks accurately and to determine risk-based premiums. The methods used by insurers provides also to estimate potential loss from a catastrophic event and their capacity or financial ability (Kleindorfer and Kunreuther 1999; Karacan 1994). They also use certain methodologies (e.g. probable maximum loss [6] by assigning a monetary value, whether to insure and not to insure some specific risks such as fires and earthquakes (Kleindorfer and Kunreuther 1999).

However, this trend is criticized in United Kingdom, as causing the unaffordability of low income households and the increase of the demand for government compensation after disasters (Freeman et al. 2003). Another critique rised from Germany, because the demand for this insurance solution is quite limited (5-10%). Although mandatory insurance proposal is dropped and ceased Ministry of Environment forbidded building and commercial usage of flood areas, which means banning economicy activity in these areas. However, there are also discussions that Germany needs to design social insurance schemes for natural disasters instead of pure market solutions (Schwarze and Wagner 2007). Because of similar reasons, Belgium introduced the Land Insurance contract Act in 2003 to offer compulsory insurance for natural hazards in fire policies. When the State is responsible for the implementation of all non-structural and structural mitigation measures, the individuals are expected to purchase insurance to create solİdarty (CCS 2008).

Third, insurers also tend to encourage risk mitigation in society through risk communication programs and ensuring the implementation of building codes (Ryland 2000). In fact, risk-based premiums and incentives provide low-risk people to inform their risks as well as serves as an encouraging mechanism for adoption of risk mitigation measures (Linerooth-Bayer et al. 2003). In addition, insurers urge communities to adopt comprehensive land use plans that consider natural hazards, when they

devised a land use pledge to raise public awareness for the benefits of planning and taking hazards into account (Ryland 2000).

Table 3.1. State-Backed National Disaster Insurance Pools
(Source: Gurenko 2004)

Natural Disaster Insurance Pool	Country	Establishment
Elementarschadenpool	Switzerland	1939
Consorico de compensacion de Seguros	Spain	1954
Japanese Earthquale Reinsurance Company	Japan	1966
National Flood Insurance Program (NFIP)	USA	1968
Icelandic Catastrophe Fund	Iceland	1975
Norsk Naturkadepool	Norway	1980
Catastrophes Naturelles	France	1982
Florida Hurricane Catastrophe Insurance Fund	USA	1993
Hawaii Hurricane Catastrophe Fund	USA	1993
Earthquake Commision (EQC)	New Zealand	1994
California Earthquake Insurance Authority (CEA)	USA	1996
Fonden	Mexico	....
Turkish Catastrophe Insurance Pool (TCIP)	Turkey	2000
Taiwan Residential Earthquake Insurance Pool	Taiwan	2002

Fourth, there emerged national or regional insurance pools, which differ in their implemented insurance techniques and principles such as consittuting social solidarity through State's inclusiveness, i..e social insurance, or ensuring the insolvency of the insurance pool through State's financial support. These pools emerge in several countries, where private insurance companies cooperate with governments to insure the citizens against non-marketable and/or uninsurable catastrophic risks (Ericson and Doyle 2004: 137). These public-private partnerships balance the government involvement and commercial insurance practice (Andersen 2005:27). These insurance pools use insurance techniques to transfer the catastrophe risk from national insurance system into worldwide risk sharing pools. These pools are backed by substantial capital resources, sometimes supported by generous tax regimes that allow the accumulation of reserves against future catastrophes out of pre-tax income (Gurenko 2004). Currently, there are operating different catastrophe insurance pools in different countries for varying natural disasters (Freeman et al. 2004; Gurenko 2004).

3.3. WHICH MODELS OF NATURAL DISASTER INSURANCE POOLS CAN BE USED FOR RISK MITIGATION FROM THE NEW INTERNATIONAL POLICY PERSPECTIVE?

Applying the sustainability principles, the insurance pools can be expected to provide both the efficiency of the pool and the social equity in the society (UN/ISDR 2004). These criteria are defined in this study as:

- Criteria 1: Efficiency: Insurance institution can be assumed as not intending profit making; however, there can be kept at least efficiency principle of private insurance to make the insurance sustainable and to gain social welfare. Thus, the efficiency principle necessitates overcoming the threats involved with natural disaster risks [7], which requires high penetration ratio and risk mitigation in society through incentives that requires risk-rated premiums.
- Criteria 2: Equity: Due to the socio-economic differences in the society, insurance programs need to overcome market failures that create inequalities. Therefore, second criteria requires to keep the social justice and fairness principles of State by offering adequate and affordable disaster insurance. Creating social justice through inclusiveness, therefore, provides also cross-subsidization, redistribution and solidarity.

3.3.1. Can Social Equity be provided through Flat-Rated Premiums?

Certain national insurance pools, e.g. France, Norway, New Zealand and Spain, offer flat-rated premiums to provide social solidarity (CCS 2008). Flat-rated premiums are usually determined over the value of the insured property (Freeman et al. 2003:22). Flat-rated premiums provides to implement the inclusiveness principle of State so that State can behave all citizens in an equal way through compulsory and affordable premiums (Priest 1996; 2003). In addition, the inclusiveness of compulsory and affordable insurance provide cross-subsidization (subsidy of high-risks by low-risks) and creates social solidarity (Freeman et al. 2003: 22). That is, such an insurance serves as a collective redistribution mechanism and social and economic gains (enhancing social welfare) are achieved.

Moreover, cross-subsidization and compulsory nature ensures spread of insured risks over entire population by shifting/reducing information asymetry without exclusion and discrimination. This can be achieved through State's broad social entitiy (Priest 1996; 2003). in two ways: 1) increasing the variety of the insured risks through different combinations of risks (i.e. traffic accidents, thefts, etc.) or that of similar risks at the same time, and 2) diversifying the geographical distribution large enough (Kunreuther 1998; Linerooth-Bayer et al. 2003; Ganz 1998; Li 1998; Athearn 1969). Finally, offering cheaper premiums on collective basis provides State insurance to generate 'economies of scale' and 'reduce transaction costs' (Faure 2006) in contrast to market insurance (Stiglitz 1994; Stiglitz 2003).

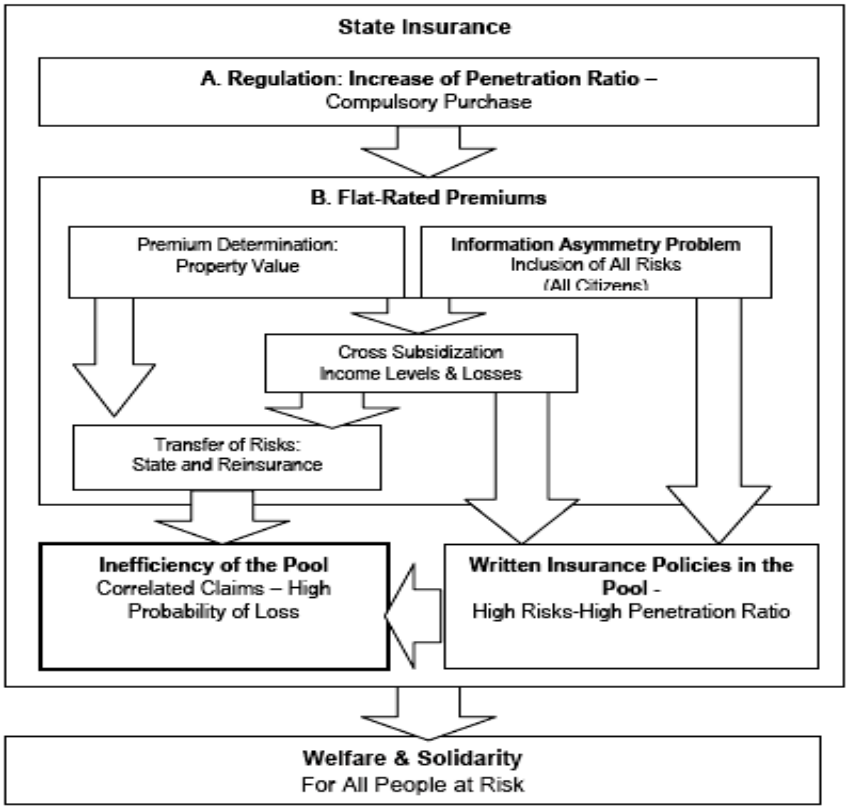


Figure 3.3. Mechanism of State Insurance
(Drawn by the Authors, Source: Priest 1996; 2003; Freeman et al. 2003)

Flat-rated premiums can have several disadvantages. First, political responsivenes that leads to increase in the physical risks of the built environment (Priest 2003). Second, lack of risk reduction techniques (aggregation, seggregation and contractual techniques) are not used because risk classification can diminish equal treatment to citizens (Priest 2003) and executing uniform premiums collectively usually causes to implement insufficient incentives (Faure 2006). However, lack of risk mitigation incentives can cause moral hazard, which means increase of risky activities (e.g. settling in hazardous areas and/ or discouraging risk mitigation). Thus, flat-rated premiums cause the inefficiency of the insurance pool because of the inclusion of highly correlated risks and creation of information asymmetry problems (Priest 1996; Priest 2003; Schwarze and Wein 2005). In addition, lack of risk mitigation incentives can cause moral hazard, which means increase of risky activities (e.g. settling in hazardous areas and/ or discouraging risk mitigation).

Hence, France had recognized that flat-rated premiums discourage individuals and communities to take risk reduction measures. Therefore, France attempts to decrease the compensation of properties in high risk areas and introduces incentives to relocate or to take other mitigation measures (Freeman et al. 2003:22). On the other hand, risk-based premiums are usually used in the insurance pools, where private insurance is dominant and help to reduce the financial risk in insurance pool (Priest 2003). The examples can be given as CEA, HHRF and NFIP in USA. The efficient work of hazard insurance depends also on the selection of low risks and determination of risk-rated premiums to estimate losses accurately and to offer risk mitigation incentives.

3.3.2. Can the Efficiency be Achieved through Risk-Rated Premiums?

The Tariff of insurance is likely to include a range of risk levels with different characteristics that provide to determine premium prices through a range of risk factors such as: earthquake hazard probability, the strength of soil, the vulnerability/ resistance of the building, and other correlated risks as urban usage risks, urban tissue risks, hazardous units' risks that gives information about the correlation level of insured houses. Obtaining this information requires scientific assessment of risk through urban risk maps, on one hand. On the other hand, individuals can be encouraged to inform their risks through contractural methods, which requires building certification.

Obtaining accurate information can satisfy to assign actuarially fair premiums, to prepare risk portfolio and to set deductible and co-insurance programs in diminishing insolvency risk (Kunreuther 2001). On the other hand, using contractual methods, e.g. deductibles and coinsurance mechanisms, provides lower price insurance premiums as incentives to low risk households to inform their risk level. Through offering high deductibles [8] in insurance contracts, insurers can decrease the adverse selection problem. Unless the premium schedule could be differentiated wide enough due to regulatory or other reasons, the insurers will still incure from the losses due to the encouragement of high risk consumers to purchase insurance at lower prices that were designed under the lower loss risk expectations (Kohler 1982). On the other hand, the coinsurance mechanisms are envisaged to make the insured people responsible for paying a certain amount of compensation based on the risk levels (Kohler 1982). Therefore, insured people with higher risk undertake higher part of the loss (Kohler 1982; Li 1998). Insured people with low risk can be offered to participate into the coinsurance mechanism through giving them less shares in the compensation of losses. That is, insured people with high risk can be made responsible to pay higher share in the compensation of the losses (Li 1998).

For example, according to the California Insurance Code, CEA policyholders who have retrofitted their homes with respect to the standards and to the extent set by the CEA Governing Board receive a 5% premium discount (CEA 2008). On the other hand, in 1996, Hawaii Hurricane Relief Fund (HHRF) developed a hazard mitigation program. HHRF offers incentives in the form of reduced premiums to encourage homeowners to strenghten their homes against hurricanes (FEMA 2008). Similarly, NFIP offers also risk-rated premiums and premium reductions. Premium reductions for those living in safer places with certified buildings can act as an incentive (reward) (Kunreuther 2001). Coinsurance mechanisms, through which the insurer does not promise to compensate the total loss and can have less losses, can provide to take risk mitigation measures (Li 1988). Coinsurance can be implemented in two ways. Firstly, insurers can limit the compensation in the contract through deductibles instead of reducing the premium [9]. Secondly, insurers can limit the contract for only to those certified buildings (reward and coercive) (Kunreuther 2001).

3.3.3. National Flood Insurance Program in USA: An Integrated Model of Urban Mitigation Planning with Insurance

Contribution of NFIP into risk mitigation at the administrative level is essential to meet the needs of MLICs. Indeed, NFIP provides mandating and monitoring the implementation of hazard mitigation measures in terms of urban planning at the local administrative level. NFIP requires the inclusion of hazard mitigation tools at the state level (Burby and Dalton 1994). For example, if a community participate to NFIP, it has to reduce future flood risk in floodplains through adoption and enforcement of a floodplain management ordinance. In other words, local communities in NFIP restrict the location and design of buildings in flood plains to meet NFIP standards and have positive steps to reduce future losses (Freeman et al. 2003:23). In turn, Federal Government makes flood insurance available for this community as a financial protection against flood losses (NFIP 2002).

On the other hand, local adminisitrations require financial resources and programs that mandate, offer incentives and monitor the application of standards. Knowing and estimating the risks in the insurance pool can also provide to assess the transfer of the possible monetary contribution from insurance pool to the risk mitigation activities. For example, in NFIP, when communities receive credit from CRS to mitigate the risks, CRS contributes them through premium reduction. Therefore, the reduced flood risks are reflected to the premium rates (NFIP 2002). In addition, the Flood Mitigation Assistance (FMA) program assist States and communities to mitigate flood risks through planning and to reduce flood damages to NFIP insurable structures. The funds of FMA are available only before disaster strikes, when only the mitigation projects in approved FMA plans can receive project grants that

include conducting local planning meetings to obtain citizen input; contracting for engineering or planning technical assistance; surveying structures at risk of flooding; and assessing repetitive losses (NFIP 2002).

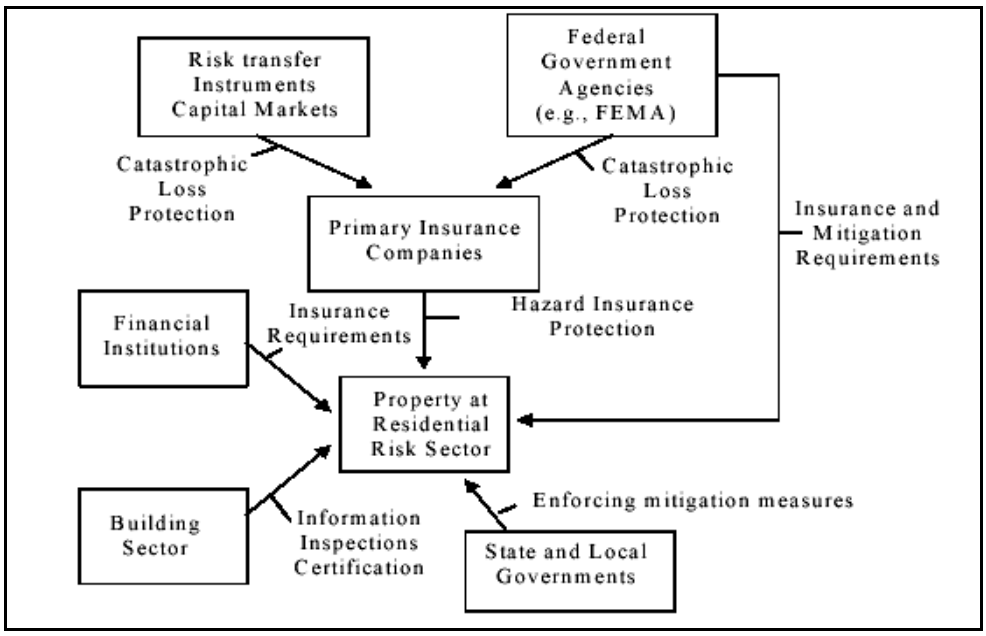


Figure 3.4. Major Actors to Manage Disaster Risk in the United States
(Source: Freeman et al. 2003: 23)

NFIP is dealt with risk mitigation in a comprehensive manner by offering Community Rating System (CRS) since 1990. CRS provides the mitigation of risks through offering discounts on the insurance premiums of communities that have flood plain management programs, which goes beyond NFIP minimum standards. The aim of CRS is to offer incentives, to reduce risk and to encourage for taking mitigation measures and protect natural resources. The creditable activities of CRS are organized under four categories as Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness. The credits are given for adopting smart growth land development criteria, more restrictive regulation, acquisition, relocation or floodproofing of flood-prone buildings, low-density zoning, clearing buildings from the floodplain, returning the area to open space, preservation of open space and other measures. Over 900 communities in NFIP, which represent over 66% of insureds, receives premium discounts due to their risk reduction activities that are beyond the minimium standards of NFIP (NFIP 2002).

3.4. WHAT ARE THE LIMITS AND OPPORTUNITIES OF PUBLIC-PRIVATE POOLS IN MEDIUM-LOW INCOME COUNTRIES?

Emerging insurance pools use different techniques according to varying socio-cultural and political contexts of HICs. Thus, there was a need to discuss implementation of insurance techniques in the national insurance pools as policy options. Possible problems and ways to overcome them in satisfying efficiency and equity criteria are categorized in two steps as:

A: Increasing penetration ratio through regulation alternatives. Are voluntary and compulsory purchase strategies of hazard insurance sufficient to increase penetration ratio and satisfy social equity and risk mitigation at the same time?

B: Determination of premiums through alternative ways. Are the ways to determine premiums through flat-rated or risk-rated premiums sufficient for satisfying social equity, efficiency and risk mitigation at the same time?

Searching out answers of these questions, the following discussion regards the new policy perspective, which addresses implementing complementary social and economic policies for poverty alleviation to reduce vulnerability to hazards, which is involved with the reduction of root causes of vulnerability (UN/ISDR 2004).

-

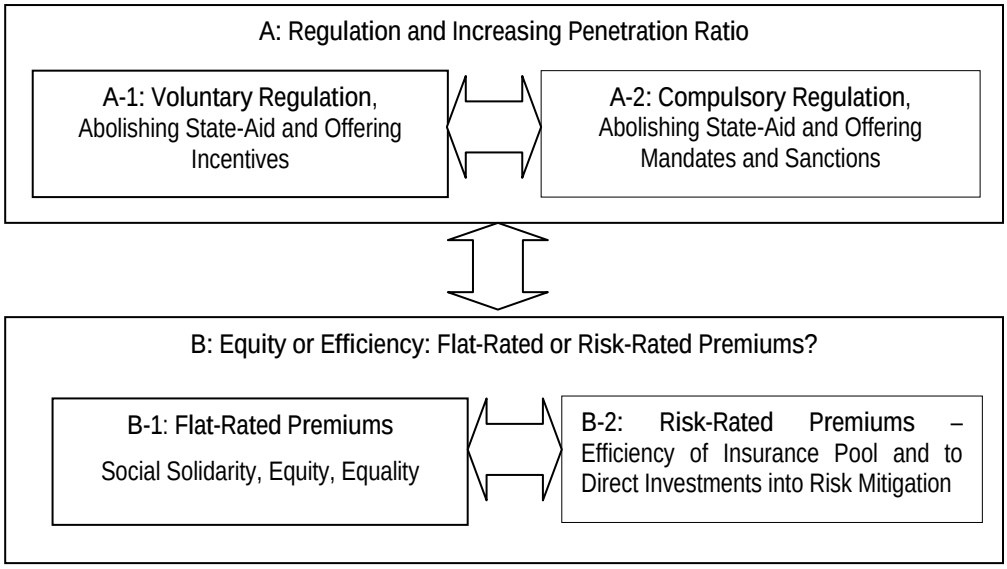


Figure 3.5. Main Policy Options in Implementing Hazard Insurance Pools

3.4.1. Which Regulation of Hazard Insurance should be preferred: Compulsory or Voluntary?

Efficiency of insurance pools requires, firstly, increasing the penetration ratio to achive the law of large numbers of insurance techniques, which differs in countries as voluntary and compulsory purchase. In other words, the policy makers should decide to implement 'reward' or 'coercive' power, from regulatory perspective. Thus, designing such strategies requires assessment of households' perception, behavior and reaction to regulatory strategies. Therefore, mandates, sanctions and incentives can be implemented to increase insurance penetration ratio. However, country experiences shows that households do not purchase insurance voluntarily. Because of the low demand for voluntary hazard insurance, high income countries tend to offer compulsory coverage [10]. In other words, catastrophe endorsement is usually offered as part of homeowners, property or fire policy in most countries (Gurenko 2003).

The compulsory coverage is observed as increasing the penetration ratio in these countries [11], while the countries with low insurance ratio attempt to mandate compulsory purchase (Gurenko 2003) [12]. That is, the inclusiveness of the State through compulsory purchase can overcome the social inequality obstacle of voluntary purchase. However, developed country experiences in compulsory coverage under market conditions shows that there is at least a need to implement certain conditions to require insurance policy such as mortgage contracts [13]. Coercive power, i.e. mandates and sanctions, can be applied for people who do not renew their policies for a period. Abolishing State-aid can be another mandate to direct homeowners into compulsory insurance purchase. In addition, insurance purchase is also made compulsory within the boundaries of communities participated to NFIP, because households do not purchase insurance in voluntary conditions. Therefore, compulsory implementation of hazard insurance, can be a suitable strategy in medium and low income countries.

➔ *A-2: Compulsory Purchase of Insurance (and abolishing State-aid)*

However, 'social equity' princinciple of the international policy framework requires to implement affordable prices for insurance contracts, because households in medium-low income countries have also medium and low income levels. the social risk management (SRM) approach can be used for those socially vulnerable people. SRM incorporates individual and macro-economic risks and emphasises to assess the potential risks and prepare the social protection [14] measures such as safety nets for reducing risks and self-reliance in recovery (Holzmann and Jorgensen 2000; Holzmann 2001). Accordingly, there can be applied strategies that combine informal, market-based and public

arrangements[15] (Holzmann 2001). From this point of view, socially vulnerable groups should access to affordable hazard insurance. One strategy to implement affordable hazard insurance can be offering subsidized rates (the insured pay less than their full premium) to low income people or sociall vulnerable groups [16]. Another strategy can be offering microinsurance to the poor that cannot access insurance premiums (UN/ISDR 2004). In addition, complementary social protection policies can be applied by hazard insurance such as social insurance through affordable insurance rates, which in turn can enhance the capacities of people (Holzmann 2001). Therefore, these complementary policies can be called as:

➔ *C1: Affordable, Subsidized Premiums, Microinsurance and Social Insurance*

Implementing regulatory strategies, requires, surveillance of the process and creating risk awareness in society. In fact, there are discussions that high insurance penetration ratio can be achieved through compulsory insurance that can achieved by the State that is the largest entity at the national scale (Schwarze and Wagner 2007). As the representatives of State in community level, local administrations have the authority to record property taxes and charges as well as communal activities – water-supply, canalization, urbanization and drafting of the settlements, and administrative service of the citizens on the territory of the municipality with documents, permits, licenses, payments etc., connected with building plans, residence, housing and permissions for execution of private services. Therefore, they can also monitor the purchase of insurance as an alignment to the taxes, charges, or services such as building plans and permits as well as during execution of private services such as electricity, natural gas, etc. In other words, purchase of insurance can be controlled or monitored by local administrations, when people in need of subsidized insurance premiums can also be determined by local administrations. This means there should be implemented complementary strategies through local administrations such as:

➔ *C2: Cooperation with Local Administrations*
- *for Surveillance of Risks, Mandates and Sanction, Rewards and Incentives*
- *to Determine Socially Vulnerable Groups and Implement Affordable, Subsidized Premiums, Micro-Insurance and Social Insurance*

3.4.2. Which way should be preferred to determine insurance premiums: Flat-rated or Risk-rated?

If hazard insurance pool include all risks without risk mitigation, it can confront financial difficulties. Despite, some hazard insurance pools, i.e. in France and Spain, are established to satisfy social equity principle. In an attempt to create solidarity for compensation of losses, they offer flat-rated premiums. However, flat-rated premiums can discourage risk mitigation and result in the increase of risk causing activities at the household level (Frame 2001; Priest 2003). In other words, flat-rated premiums causes moral hazard and adverse selection problems and inefficiency of the pool. In addition, citizens can suffer a welfare loss if they are forced to purchase a uniform insurance premiums, which are not adapted to particular demands and risk profiles (Faure 2006). At the society level, such an insurance can cause creation of social inequalities, particularly if the ratio of high risks is greater than that of low risks. In other words, people at low risk has to pay higher premiums in such a situation. Inequalities can also be created depending on risk spreading, which is based on the treatment of all level of risks in the same way and forcing no-risk people to purchase insurance (Priest 2003) as well as offering less variability in choices by ignoring differences in preferences and needs of different individuals (Stiglitz 1994; Stiglitz 2003). Thus, social justice cannot be achieved due to failure in reaching all citizens and discouraging risk mitigation, when social solidarity is threated due to loss of social welfare (Priest 2003).

Hence, efficiency of insurance pools requires risk-rated premiums, estimation of risks accurately and selection of good-low risks. For this reason, some insurance pools, e.g. CEA and NFIP, offer risk-rated premiums, therefore they can also encourage risk mitigation so that insurance pools can confront lower losses after disasters. In addition, the insurers in United Kingdom also tend to offer risk-rated premiums to improving their risk estimation methods. Risk mitigation incentives, through premium reductions and coinsurance mechanisms will not only provide the efficiency of the insurance pool, but can encourage households into risk mitigation which will result in the social welfare. Therefore, the suitable strategy to determine 'premiums' can be 'risk-rated' premiums'.

➔ *B2: Implementing Risk-Rated Premiums to reduce the financial risk*
- *Estimation of Risks and Reducing Risk of Insurance Pools*
- *Encouraging Risk Mitigation at the Households Level*

However, from insurers' perspective, risk mitigation strategies through risk-rated premiums require a surveillance system, through which buildings that meet the required building codes and standards can be determined. Such an implementation requires implementing 'seal of approval' in cooperation with local administrators and insurers (Kunreuther 1998; 2006). In addition, changes in risk levels has to be monitored. However, risk monitoring and screening is highly expensive in market. Despite, the State entities, especially urban planning and local administrations can acquire accurate and sufficient risk knowledge in the built environment. Hence, national insurance pools can cooperate with both local and central administrations for applying and monitoring the urban plans and the construction standards (Kunreuther 1998).

➔ *C3: Cooperation with Local Administrations*
  - *Acquiring Accurate Risk Estimations from Urban Risk Mitigation Plans*
  - *Implementing and Monitoring Urban Risk Mitigation Plans, Building Codes and 'Seal of Approval'*

3.4.3. Achieving social equity through risk-rated premiums necessitates risk mitigation with urban planning policies

Risk-rated insurance contracts are usually sold as voluntarily, which results in social inequality problems. The equitability of insurance pools, however, requires fair treatment to citizens that can be achieved through compulsory and affordable premiums. First, expensive premiums on high-risk properties can cause to decrease of the insurance demand in hazard prone-areas as experienced in Florida and California (Kunreuther 1999). That is, social inequality can be created, if high-income level homeowners purchase insurance, while low income homeowners cannot afford to expensive insurance premiums. On the other hand, people with lower risk perception can also fail to purchase insurance. Therefore, these people can be excluded from the financial protection against natural disasters automatically (Ericson et al. 2003; Tierney 2006:122-6; Kunreuther and Slovic 1978). In addition, although homeowners are expected to take risk mitigation measures before natural disasters, they usually do not voluntarily in the market (Lindell and Whitney 2000), even if the insurers offer deductibles to encourage mitigation (Kunreuther and Slovic 1978). Moral hazard can cause the lack of incentive to take preventive action because of the safety feeling in the case of being insured (Li 1998). On the other hand, the policy of state emergency aid not only dampens the demand for insurance, but also reduces the incentive to make provisions for self-protection, and reduces the pressure on local policy-makers to take public protection measures (Schwarze and Wagner 2007).

For these reasons, inclusiveness and justice that brings together 'solidarity' and 'redistribution' principles seems to be not provided by risk-rated premiums, at the first glance. Despite, partnership of State into hazard insurance pools can provide alternative policy solutions to achieve social equity and efficiency together. As sustainable development and risk mitigation plans requires, risk mitigation strategies should link individual (private) and social (public) responsibilities. Therefore, all stakeholders, individuals/ households, insurers/ insurance pools, urban planners/ local administrations, and central administrations should share certain responsibilities and cooperate for the benefit of society. Failure of individual decisions addresses the necessity for hazard awareness and risk communication programs, when prevent social inequalities depending on the social-equity principle requires consideration of differentiating levels of social and economic vulnerabilities. Vulnerability can be reduced by the application of proper design and patterns of development focused on target groups, when sustainable development requires full participation among all public and private stakeholders in mitigation process.

Firstly, Yokohoma Strategy (1994) noted that improvement of public awareness promotes a safety culture in vulnerable communities, which is necessary to reduce the large-scale impacts of natural disasters by changing human behavior. This can be achieved in terms of changing people's risk perception and increasing their willingness to manage the risk. Therefore, people can be encouraged to take voluntary risk reduction activities such as safe construction, retrofitting, and household preparedness. The aim of these programs should not only convey an understanding about hazards and risks to the public, but also motivate people to become involved in activities to reduce their risks. That is, the community safety approach sees the community as an active participant in its own safety in two ways as bottom-up and top-down (UN/ISDR 2004; O'neil 2004; OECD 2009).

Therefore, basic principles include the understanding of local perspective, inclusion of all sections of society, different types of messages to reach various target audiences and sustained efforts in terms of campaigns (UN/ISDR 2004). Land use planning is involved with citizens in all phases of planning process and programs in terms of building citizen awareness of the risks posed by natural hazards, creating a base of citizen support for efforts to reduce risk by planning for and managing urban development and redevelopment (Burby 1999). In preparing plans, local governments engage in a consensus-building process, so that key questions and issues regarding the use of hazardous areas can be resolved. Through land-use planning, the limitations of hazard-prone areas are understood by citizens, potential investors, and government officials (Burby et al. 2000). In addition, local administrations can also organize and manage public programs to increase the awareness and risk

perception of Households against natural hazards, and risk mitigation measures, including hazard insurance.

➔ *C4: Risk Communication and Public Awareness Programs through Urban Risk Mitigation Plans in Cooperation of Hazard Insurance with Local Administrations*

Secondly, if households in low income levels cannot afford risk mitigation, there can be applied further strategies. Low-income homeowners that have poorly constructed homes can also incure the upfront cost of mitigation due to budget constraints. They usually can not afford the costs of mitigation measures nor the costs of reconstruction after a damage. In this situation, taking mitigation measures can be made financially attractive to homeowners through providing funds for mitigation (Kleindorfer and Kunreuther 1999). Insurance premiums and coinsurance programs can be linked to bank credits in the case of seismic upgrades. Therefore, banks can feel that property is well protected against a catastrophic loss, when insurer can ensure that potential loss from a disaster is reduced (Kunreuther 2006).

These incentives with low interest loans and grants can be provided either for adopting cost-effective measures or for relocating low income homeowners into safer areas. In addition to the equity considerations, this subsidize of mitigation can justify also efficiency of insurance pools since these low – income homeowners are likely to receive State assisstance after a disaster (Kleindorfer and Kunreuther 1999). The financial attractive of mitigation measures to homeowners can be provided, if the banks that hold the mortgage on the property provide funds for this purpose (Kunreuther 2006). These funds can be in the form of home improvement loan that provides a payback period identical to the life of the mortgage, i.e. in the long term and with low interest rate. Therefore, the property owner can pay 'lower total payments' by investing in cost-effective mitigation (Kleindorfer and Kunreuther 1999). This can be done through linking the mitigation expenditure to the structure (Kunreuther 2006). In addition, micro-finance can be another effective tool for strengthening access of poor households to credits, savings, and other financial services. Therefore, micro-credits can be provided to enable low income people investing mitigation measures.

➔ *C5: Encouraging Medium- Low Income Households for Risk Mitigation*

- *through Linking Hazard Insurance with Long-Term Banking (or Micro-Finance) Credits*

Fourth, if the risk is very high, State, i.e. local administrations, can be involved with the enforcement of risk mitigation. In this situation, expensive insurance premiums can function as mandates and sanctions, particularly if the hazard insurance is mandatory. Although applying private insurance techniques provides to encourage risk mitigation, the rate of risk mitigation becomes low under market conditions. Therefore, high risk properties can not only be provided with incentives such as very expensive insurance premiums or exclusion from insurance, but also be forced to decrease their risks or to move into another place through using urban planning tools such as land and property acquisition (Olchansky and Kartez 1998; Burby et al. 2000). Other tools can be adopting smart growth land development criteria, more restrictive regulation, acquisition, relocation or flood-proofing of flood-prone buildings, low-density zoning, clearing buildings from the floodplain, returning the area to open space, preservation of open space and other measures as required by NFIP from the local governments that participate to the insurance program in the USA (NFIP 2002).

➔ *C6: Mandates and Sanction through Land-Use Planning Tools*

Fifth, the most affected by natural disasters are the poor and socially disadvantaged groups in developing countries (Yokohoma 1994), because of the high costs of urban land, low levels of affordability, inappropriate land policies and speculative developments by the private sector (UNISDR 2004). Therefore, the strategies can incorporate public and private solutions in providing access to land and housing as well as risk mitigation tools.

a. Providing Access to Land and Housing: In developing countries, to restrict the encroachment of residential settlements onto physically hazardous sites, the solutions can be to improve access to land for housing the poor and to envisage public housing schemes for the poor with low costs but effective in meeting people's qualitative and quantitative needs. These can be achieved through direct or indirect intervention of government and requires residential zoning, expansion of infrastructure and improvement of transportation as well as new employment opportunities to supply urban land. Many financial incentives can be provided to private sector to encourage development of vacant land, through tax exemption, infastructure development, land transactions and land taxes. Moreover, access of households to public housing schemes can be provided by formation of housing associations, providing adequate financial institutions for loans and credit, improving the rent laws and increasing the density of urban locations (El-Masri and Tipple 2002).

b. Participation into Urban Planning Process: Participation of citizens into hazard mitigation planning process is also critical from the aspect of democracy in a sustainable society and that of creation the pressure on local administrations to consider hazard mitigation in urban plans (Bury and Dalton 1994), particularly in communities facing high hazard risks (Godschalk et al. 1998).

c. Legitimization of Informal Settlements through Risk Mitigation: In developing countries, the existing informal settlements and slum areas can also be legimitized and improved through risk reduction in terms of adequate access to loans, resources and technical support, when the use of appropriate technology and local materials are essential. The improvement of setllements' conditions requires also investments for road networks and open areas for public use, which can be used for escape routes and emergency situations, in turn (El-Masri and Tipple 2002).

d. *Social Projects for Risk Mitigation:* Moreover, insurance can contribute to the social funds that aim to reduce risks in terms of the community grant programs. In this way, grants for projects can enable local administrations to strengthen public assets (i.e. infrastructure, hospitals, schools, etc.), as well as private assets (vulnerable houses and small businesses) by providing access to loans, credits and micro-credits.

➔ *C7: Enhancing the Rights and Capacities*
  - *Providing Access to Land and Housing*
  - *Participation into Urban Planning Process*
  - *Legitimization of Informal Settlements through Risk Mitigation*
  - *Social Projects for Risk Mitigation*

From urban planning and local administrations perspective, the dichotomies between implementing compulsory and risk-rated premiums can be overcome through cooperation of hazard insurance and urban planning as observed in NFIP Model. Therefore, implementing risk mitigation projects in communities can be possible through financial contribution of insurance pools into risk mitigation. In addition, cooperation of urban planning, local administrations and central administration within such a program like NFIP can provide to overcome 'monitoring needs' of sustainable urban risk mitigation plans. Moreover, such a program can link individual and social responsibilities to overcome underlying reasons of individual decision failures in voluntary purchase conditions. In other words, when local administrations' risk mitigation efforts can be monitored by a comprehensive program, local administrations can also monitor risk changes. Indeed, participation into urban risk mitigation plans can also provide to monitor activities and plans of local administrations by households.

➔ *C8: Cooperation with Local Administrations and Central Government*
  - *Financial Contribution to Risk Mitigation Plans and Projects*
  - *Monitoring Urban Risk Mitigation Plans and Projects*
  - *Creation of Community-Grant Programs*

3.5. CONCLUSION: POLICY OPTIONS TO IMPLEMENT HAZARD INSURANCE IN MLICS

Risk society theory of Ulrich Beck (1992a) claims that the world society confronts with the changing characteristics of risks and insufficient mechanisms of industrial society, particularly insurance. Concaminantly, the world society moves into a new stage as reflexive modernization in a self-critical way. This claim seems to be also true for natural disaster risks. The contemporary world society increasingly confronts with the catastrophic impacts of natural disasters, when conventional model of disaster management and ex-post financing becomes limited, particularly in the MLICs. The emerging new international policy addresses a reflexive policy shift toward an innovative and comprehensive model as NDRM. Natural disasters are accepted as socio-spatial products, manufactured risks, that result from urbanization process. Hence, urban planning is given the central role in manufacturing securities through sustainable development. New role of urban planning is, therefore, not only limited with the integration of hazard mitigation into technical and physical land-use plans. Its role is also involved with the social processes and economy. That is, social relations that produce vulnerability should be reversed to build resilience in society. This requires regarding social processes and the actors in society to organize individual and social responsibilities and to enhance capacities at community and household levels. Primary necessities emerge as designing policies or strategies to monitor and finance risk mitigation at the community level, households' pro-active participation into risk mitigation and to link the household and community levels.

Within this context, 'hazard insurance' arises as the potential urban risk mitigation planning policy tool to link community and household levels for risk mitigation as well as for ex-ante risk financing. In spite of its potentials, implementing hazard insurance in MLICs is difficult according to new international policy approach, because insurance industry is not well-developed and cannot absorb catastrophic losses of natural disasters. In addition, households in these countries are not used to purchase insurance. However, insurance is also discussed as being limited in contemporary risk society by Ulrich Beck. Indeed, insurance industry became 'insolvent' because of confronting catastrophic losses after natural disasters even in HILCs, where the industry is well-developed and have large capacity. Thus, Ulrich Beck claims that this limitedness of insurance industry, which arise from its technical and economic rationality, indicates that insurance cannot be used for the contemporary risks.

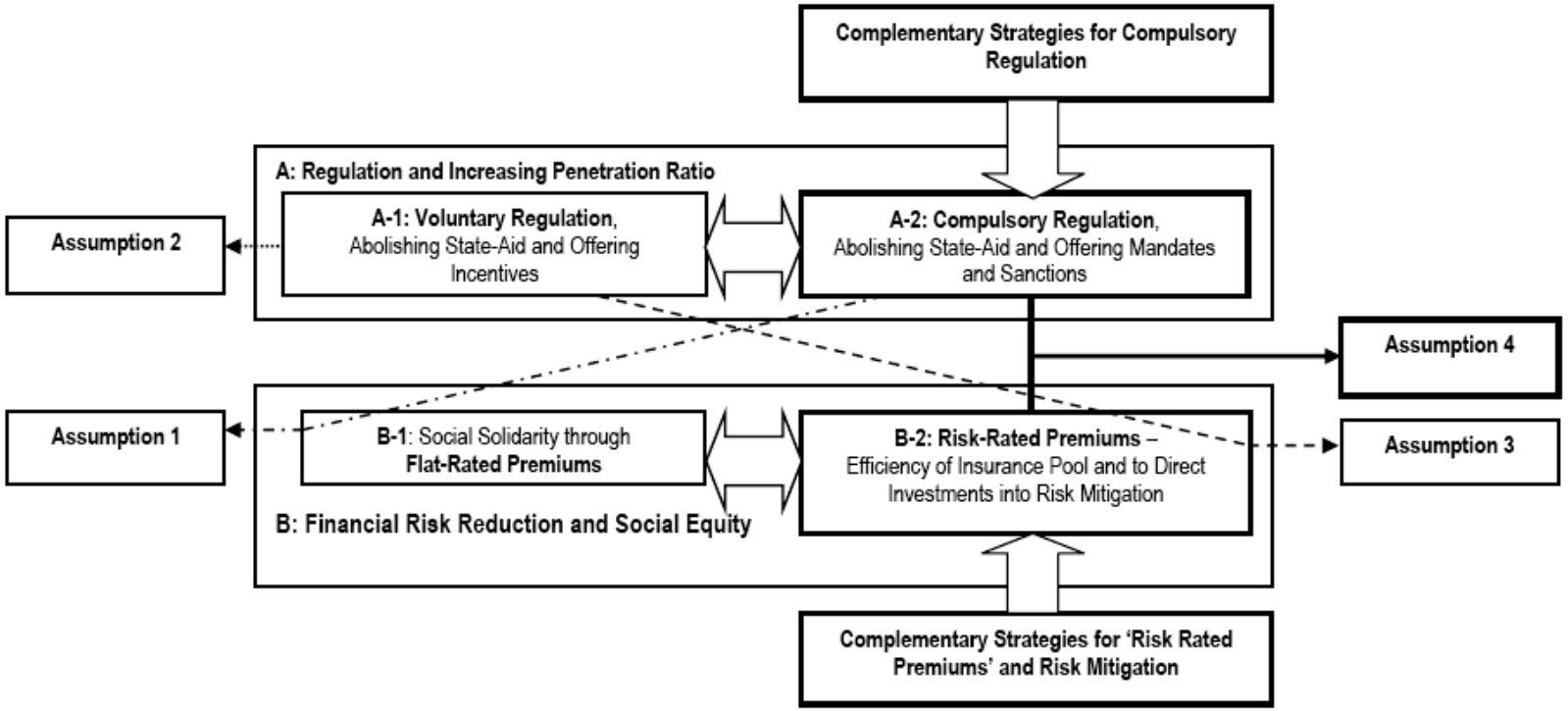


Figure 3.6. Assumptions Resulted from Discussion for Hazard Insurance Model for MLICs

Despite, increasing natural disaster losses causes insurance industry to innovate new techniques and forms. Insurance survives in its private form in some countries like United Kingdom and Germany. However, private insurance tends to use alternative market risk transfer mechanisms and to optimize risk estimation through using scientific assessments and risk rated premiums, while repsonsibility for mitigation of risks belongs usually to the State agencies. Moreover, insurers in high-risk countries or regions have established insurance pools as public-private partnerships. In an attempt to implement natural hazard insurance in MLICs, the World-Bank recommends establishment of public-private insurance pools in these countries. ZDS System in Turkey is also established from this perspective. ndeed, the World-Bank seems to have borrowed this public-private partnership insurance pool model from the trends in the world. However, there is seen no 'risk mitigation' effort in these insurance pools of the World-Bank, while new international disaster policy recommends giving priority to risk mitigation when using all financial resources. Therefore, this section of the treatise has evaluated policy options in current insurance pools around the world through setting the 'efficiency' and 'equity' principles of sustainable urban risk mitigation planning as criteria.

Regarding the constraints in the country experiences, the following assumptions are obtained:

Assumption 1: Implementing compulsory and flat-rated premiums in hazard insurance to establish 'social solidarity' causes 'inequality' in society and 'inefficiency' of hazard insurance pools, because Hhs fail to mitigate risks due to lack of incentives although all Hhs purchase hazard insurance.

Assumption 2: Purchase of hazard insurance in voluntary conditions can cause inefficiency of hazard insurance pools, i.e. low rates of insurance penetration, which can result in injustice by strenghtening socio-spatial inequalities, because households can fail to purchase insurance voluntarily.

Assumption 3: Offerring risk-rated premiums in voluntary conditions can cause inefficiency of hazard insurance pools, i.e. low rates of risk mitigation, which can result in injustice by strenghtening socio-spatial inequalities, because households fail to mitigate their risks voluntarily.

As a result, equity and efficiency principles to implement natural hazard insurance necessistate certain insurance techniques such as 'compulsory purchase' and 'risk-rated' premiums, which necessistates complementary policies in medium and low income countries. However, social vulnerability obstacles of MLICs necessitates to implement additional complementary strategies, which require combining insurance techniques with urban planning techniques; and therefore, cooperation of hazard insurance

pools with local and central administrations. In this way, hazard insurance can also meet the needs of sustainable risk mitigation at community and household levels. Borrowing NFIP Model, hazard insurance pools in MLICs can cooperate with local administrations for 1) the determination of accurate risk-rated premiums through urban risk maps, 2) surveillance of risks, 3) surveillance of mandates, sanctions and incentives for insurance purchase and risk mitigation at the collective base, and 4) implementation of social programs such as public awareness and social protection. On the other hand, insurance can support local administrations for 1) financing production of urban risk maps and risk mitigation plans and programs, 2) financing social protection policies and risk mitigation projects, 3) monitoring the efforts of communities for producing urban risk maps and plans as well as their implementation.

Hence, the further assumption is obtained as a policy guide to implement natural hazard insurance pools in MLICS:

Assumption 4: The efficient and equitable work of hazard insurance pools depends on their cooperation with local administrations and urban planning and therefore implementation of complementary policies. Therefore, all Hhs in society can purchase insurance, which can increase risk mitigation activities in the society by creating willingness for risk mitigation or enforcing risk mitigation through urban planning – if necessary-, when empowers the capacities of households and local administrations as well as hazard insurance pools; and thereby, constitutes social solidarity.

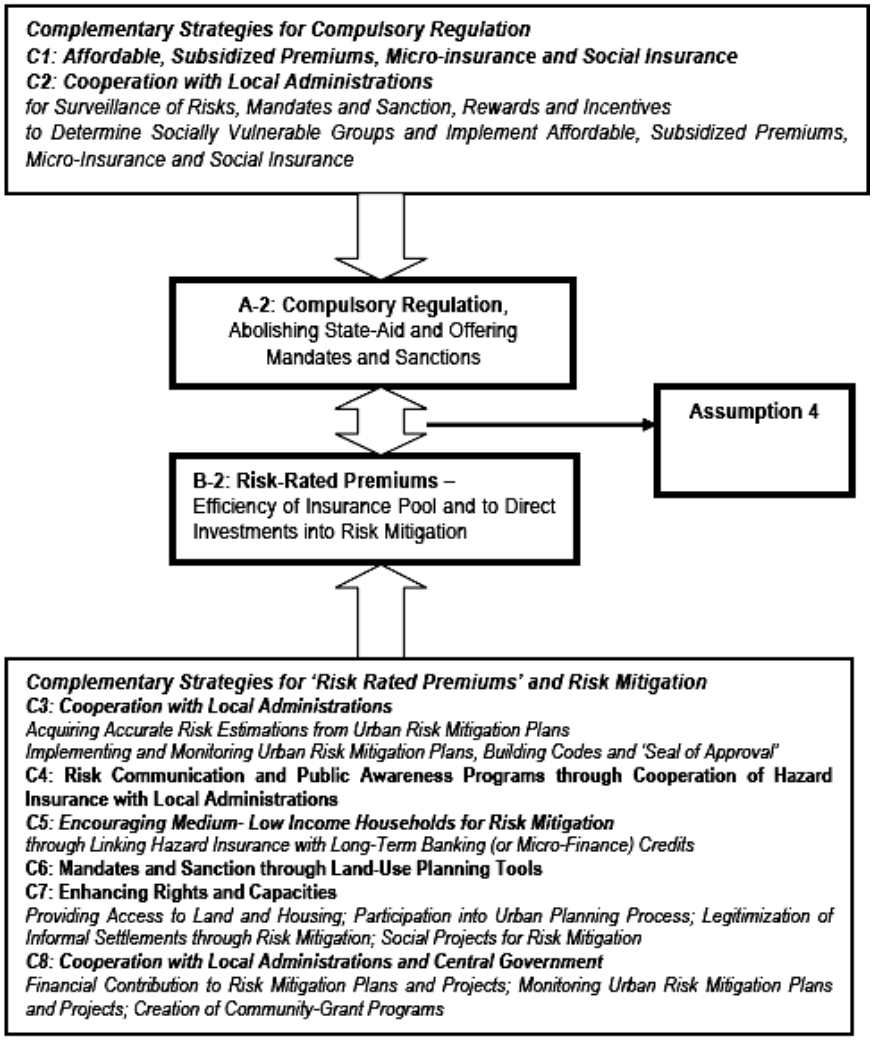


Figure 3.7. Natural Hazard Insurance Model for MLICs As Compulsory and Risk Rated Premiums through Complementary Strategies of Urban Planning in Cooperation with Local Administrations

[1] Therefore, the participation of people who are exposed to the same risk but have not lived any loss yet, provides the compensation of losses of an insured person by applying on the assets of other people (Karacan 1994). The contract of policy of indemnity makes insurance also a 'legal method' that is used to transfer the risk of a premium from one party (insured) to another (insurer).

[2] Aggregation of uncorrelated risks (statistical independence) reduces the level of expected losses in the insurance pool, when the accuracy of predictions is increased (for statistical explanation see Priest 1996). Segregation technique distinguishes high risk insureds from low risk insureds and classifying them into different risk pools; and therefore assigning actuarially fair risk-rated premiums, If insurers have perfect information (Priest 1996, 2003; Crocker and Snow 2000).

[3] For example, after Hurricane Katrina in 2005, insufficient insurance and reinsurance coverage led to 144 billion dollar damage loss, when 66 billion dollar of this loss could be financed through insurance (Swiss-Re 2007).

[4] Insurers rely on the historical data to estimate the future risk and to determine the premium prices. This methodology can work well, if there is a large database of past experiences, which can be extrapolated to the future. However, the historical data for the low probability- high consequence events are usually small since the new risks involved in the technology and environment are new processes (Kunreuther 2001). For example, scientists are able to identify the probabilities of an earthquake occurring for a given location, and they can estimate the magnitude and duration of ground shaking. But, it remains difficult to predict accurately the damage to any given structure. Specific site conditions and construction standards can cause wide variations (Li 1998). In other words, the data on the past performance of the built environment are usually lacking (Kunreuther 2001), when the vast number of variables involved makes it almost impossible and quite expensive to predict losses (Li 1998).

[5] Depending on the low flood insurance demand and increasing government aid after disasters, Austria established HORA (Hoschwasserrisikozonierung Austria) to create a natural disaster zoning system through the identification and assessment of potential risks (CCS 2008). HORA is expected to be the first step to establish a catastrophe insurance pool (Guy Carpenter 2007). Germany has also confronted increasing damages of floods in recent years (Thieken et al. 2006). German Insurers Association (GDV) implements a flood and heavy raing zoning program, i.e. ZÜRS, in insurance market to calculated premiums and to apply deductibles (CCS 2008). Although hazard insurance had long worked in market with a social agreement in United Kingdom, insurers move toward risk-based premiums due to intensifying disaster risk estimations (Freeman et al. 2003).

[6] Fire insurers used Probable Maximum Loss (PML) concept to estimate the burning probability of a building in a fire. The California Insurance Department adopts this concept to earthquake insurance in 1970 (Kunreuther 1999).

[7] the low proabibility/high consequence characteristics of natural disasters, high correlation of claims from a single event and uncertainty and incalculability of risks.

[8] Deductible means a fixed dollar amount by which any insurance company benefit payment falls short of a loss suffered by an insured (Kohler 1982). The deductible mechanisms are envisaged as offering low priced insurance premiums through high discount rates or offering high priced insurance premiums through low discount rates (Li 1998).

[9] As reward, the households that adopt mitigation can be offered lower deductible (e.g. 10%), while the homeowners that do not adopt mitigation are offered higher deductible (e.g. 15%) as coercive.

[10] In France, natural disaster insurance is offered through mandatory coverage as part of the property insurance, e.g. buildings, contents and car insurance (Schwarze and Wagner 2007). In Switzerland, natural disaster insurance is mandatory for buildings and its contents, when it is sold by private insurance companies (FOPI 2008). In 19 cantons, cantonal monopoly insurer offers property insurance with mandatory coverage of natural disasters (Raschky and Weck-Hannemann 2007). In Spain, CCS system includes natural hazard risks into personal accident policies, life insurance and some branches of property damage, compulsorily. In Iceland, ICI offers natural hazard insurance as compulsory for homes and commercial buildings. There is also an additional (seperate) insurance policy in fire insurance policy that is also compulsory. Therefore, all buildings and their contents are insured against fire are automatically insured against natural disasters (CCS 2008). In Norway, natural disasters are covered by all fire insurance of both residential and commercial properties as compulsory through Naturskadepool (Andersen 2005:39; Nordskog 2006; Naturskade 2008). In EQE program of New Zealand, insurance coverage is compulsorily included into fire insurance policy, which is underwritten in market as voluntarily (CCS 2008).

[11] In Iceland, the penetration rate for buildings is 100%. (CCS 2008). In Switzerland, insurance density for natural disasters, excluding earthquake, is close to 100% (Schwarze and Wagner 2007). In France, there is a wide distribution of insurance policies, because more than 90% of all business and homes are written by this insurance. In other words, insurance operates as a tax on property (Freeman et al. 2003:22). In Spain, the density of insurance is also high (Schwarze and Wagner 2007).

[12] For example, in Switzerland, although earthquake is not insured compulsorily, there is plan to implement it as compulsory due to the low retention of 10% of earthquake insurance (Guy Carpenter 2007).

[13] For example, in USA, flood insurance coverage was offered by National Flood Insurance Program (NFIP) voluntarily at the

beginning. However, huge losses and low penetration ratios after major disasters caused the Congress to make NFIP as mandatory for many properties in 1973. Mandatory purchase requirements (of the NFIP lenders, servicers, and secondary-market purchasers) are improved in 1994 Act, again after great losses in 1993 floods in Midwest and resulting increase in Federal disaster relief payments. 1994 Act imposed new obligations on both mortgage originators and servicers to include flood insurance compulsorily. Moreover, there are acted a range of regulatory civil penalties to the regulated lenders in the case of their failures. Setting insurance purchase as a condition of federally insured mortgage increased the demand for flood insurance (NFIP 2002).

[14] Social protection (SP), which is defined as public measures to provide income security for individuals, is given an important role from a new approach in the international policy since 1990s. The necessity of this policy change arised from the insufficiency of existing ex-post social protection policies (after crisis) to achieve the development goal and to prevent unemployment and poverty in recent years.

[15] Informal arrangements addresses the way that households protect themselves through informal (family or community) or personal arrangements (self-protection and self-insurance). Households can buy or sell their assets, and can borrow and lend informally. However, these may not be effective to deal with risks. If market-based institutions, e.g. money, banks, insurance companies, are available, households can take loans. However, formal market institutions are usually reluctant to lent to households without secured earnings. Thus, microfinance is essential instrument of SRM from this aspect. Public arrangements addresses the modern welfare state, when their implementation depends on the governments' fiscal resources, distributive concerns, administrative capacities and the type of risk involved, which are limited particularly in developing countries. If informal or market-based instruments do not exist and dysfunctional, government can provide or mandate (social) insuance programs for unemployment, old-age, work injury, disability, sickness, etc. In addition, governments can use other instruments, e.g. social assisstance, subsidies on basic goods and services, public work programs, etc., to cope with risks after they occurred (Holzmann 2001).

[16] For example, in NFIP, two distinct categories are used in flood insurance ratemaking as 'subsidized' rates and 'actuarial rates'. Since the buildings that were constructed before 1974 did not regard flood risk, their insurance policies could not be based on the full actuarial rates, which will increase the premium prices to expensive and unaffordable levels. Therefore, the Congress authorized NFIP to offer subsidized rates for those buildings. Only general rating factors are used to rate these buildings such as flood-risk zone, occupancy type, and building type. NFIP had forgone from the revenue of the difference between the actuarial full risk premium and subsidized premiums (NFIP 2002). Since the subsidized loans are provided by the US Treasury (Andersen 2005: 38), the national government plays the role of reinsurer (Freeman et al. 2003).

CHAPTER 4

CAN THE CURRENT ZDS SYSTEM CREATE RESILIENCE AGAINST EARTHQUAKES IN TURKEY?

Applying the principles of the sustainable urban risk mitigation (UN/ISDR 2004), the current ZDS system could be expected to provide both the efficiency of its system and the social equity in the society. In other words, the resilience of the society seems to be achieved in terms of the efficiency and social equity of the ZDS system. Based on the national experiences with natural hazard insurance, implementing a natural hazard insurance mechanism in MLICs like Turkey seem to necessitate various policy options to insure natural hazards with insurance techniques, particularly to increase the penetration ratio and reduce the risks. This chapter attempts to investigate the possible consequences of the implemented policy options by the ZDS system in dealing with risks to its system, which in turn would influence the resilience of the country.

4.1. HIGH EARTHQUAKE RISK THREATENS THE EFFICIENCY OF THE EXISTING ZDS SYSTEM BECAUSE OF VOLUNTARY PURCHASE CONDITIONS, INACCURATE ESTIMATION OF RISKS AND NOT PROMOTING RISK MITIGATION

The current ZDS system operates in voluntary purchase conditions and cannot estimate risks accurately, because of failures in compulsory implementation and determination of the ZDS Tariff. These failures in the operation of the ZDS system can threaten its efficiency and can result in its insolvency. Not only high probability of earthquakes, but also highly vulnerable built environment that resulted from urbanization process in Turkey threats the sustainability of ZDS system depending on its application of insurance techniques. Thus, the diffculties observed in the insurance industry can also be experienced in the ZDS system. Insuring natural disasters in voluntary conditions without estimation of risks accurately caused the insurance industry in the world to confront difficulties in paying compensations and considerable losses of companies caused their insolvency (Ganz 1998; Li 1998). These threats in Turkey can be summarized as:

a) Uncertainty and Incalculability of Risks: Since housing stock in urban areas in Turkey is produced during a rapid and uncontrolled urbanization process, identification and calculation of earthquake vulnerability in both authorized and un-authorized housing stock is difficult through insurance techniques. *The ZDS system system cannot estimate the losses accurately and can suffer from from earthquake losses as observed in experiences of insurers in HICs.*

b) High Correlation of Claims: The ZDS system can confront problem of highly correlated claims because urban areas became places of accumulated 'urban risks'. In Turkey, not only the house-buildings, but also other usages in urban areas are also vulnerable to earthquakes. This is why An example for this highly correlated urban risks can be given through LPG and fuel product stations, which can be located in the same building with housing units or very near to houses. Because the earthquake risk in housing stock is high, correlated and incalculable in Turkey, ZDS system can confront catastrophic losses and become insolvent. In other words, ignorance of risks that arise from the influence of usages each other can cause also immense destruction during earthquakes.

In other words, the ZDS system can confront to pay great amount of indemnification depending on high correlation of compensations, as experienced in HICs (Ganz 1998):

a) Single-big magnitude earthquake in a large geographical area: In Turkey, big magniture of earthquakes can occur in a large geographical area because of the mega cities in the high earthquake zones. For instance, there is expected a big magnitude earthquake in Istanbul in the next 30 years, which is the most crowded city of Turkey and settled in the 1st degree earthquake hazard zone. Housing stock in Istanbul encompasses 2.714.462 housing units and constituted 34% of Turkey's housing stock. In addition, 46% of housing stock in Istanbul takes place in the first degree hazard zone, when 42% take place in the second and 12% in the third degree zones.

b) Multiple earthquake in different geographical areas: There can occur multiple earthquakes in different geographical areas but at closer times, because almost each city of Turkey is exposed to earthquakes, but the cities and the housing stock that are settled in the highest degree hazard zones are more than others. Nevertheless, 44% of the housing stock takes place in the 1st degree hazard zone and 14% of the housing stock takes place in the 2nd degree hazard zone. Izmir, another big city of Turkey, has the second highest housing stock with 912.585 housing units (7% of Turkey's housing stock). The third highest housing stock with 902.900 housing units (7% of Turkey's housing stock) take place in Ankara, which is settled in the fourth degree hazard zone. Further cities that have high housing stock following Ankara are Bursa (4%), Konya (3%), Adana (3%), İçel (35), Kocaeli (2%) and Balıkesir (2%). From these cities, Bursa, Kocaeli and Balıkesir are settled on the 1st degree earthquake hazard zone. In general, amount of urban population and housing stock decreases from West Turkey to the East Turkey.

4.1.1. Distribution of ZDS Contracts and Penetration Ratio

To understand how differ the ZDS purchase in cities, number of insured units in provinces that is obtained from DASK for the year 2003, is regressed with 'number of housing units with construction permission', 'number of housing units with occupancy permission' and 'GDP per capita' in 81 cities of Turkey.

1) Construction Permission: The number of housing units with construction permission is obtained from the Construction Statistics Database from 1966 till 2000 (Turkish Statistics Institute-TUIK). The construction permissions by years are added and cumulative total is obtained for the year 2000.

2) Occupancy Permission: The number of housing units with occupancy permission is obtained from the Construction Statistics Database from 1966 till 2000 (Turkish Statistics Institute-TUIK). The occupancy permissions by years are added and cumulative total is obtained for the year 2000.

3) Un-authorized Housing Stock (1): The number buildings with construction permission is extracted from the number of total buildings in cities that is obtained from the Building Census (TUIK 2000). Therefore, the number of un-authorized buildings without construction permission is obtained.

4) Un-authorized Housing Stock (2): The number buildings with occupancy permission is extracted from the number of total buildings in cities. Therefore, number of un-authorized buildings without occupancy permission is obtained.

5) Gross Domestic Product (GDP/per capita):The GDP per capita gross domestic product by provinces (at current prices) are obtained from TUIK web-site for the year 2001.

Accordingly, the penetration ratio was declared as 20% (2,608,761 houses) of the housing stock in 2007. the ZDS penetration ratio is found as related to the amount of housing stock, construction permission, occupancy permission, GDP (Gross Domestic Product) per capita and earthquake hazard zone. In addition, earthquake experience of the provinces seems to influence ZDS purchase decisions, when the renewal ratio of ZDS contracts was explained as 36% in the year 2007.

Table 4.1. Correlations for ZDS Purchase among Cities

		ZDS Penetration Ratio (2007)
Earthquake Hazard Zone	Spearman's rho Correlation Coefficient	-.258*
Amount of Housing Stock	Pearson Correlation	.408(**)
Construction Permission (2000)	Pearson Correlation	.477(**)
Occupancy Permission (2000)	Pearson Correlation	.467(**)
GDP per capita (%)	Pearson Correlation	.677(**)
Unauthorized Housing Stock (1)	Pearson Correlation	.298(**)
Unauthorized Housing Stock (2)	Pearson Correlation	.360(**)

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed). a Listwise N=81

4.1.2. The ZDS system confronts low penetration ratio problems because of voluntary purchase conditions

Voluntary purchase conditions of ZDS contracts causes low demand of homeowners and low penetration ratio of the ZDS system. If the risks are very high, the efficiency of insurance mechanisms requires, firstly, increasing the penetration ratio to satisfy 'the law of large numbers' of insurance techniques (Priest 2000; 2003). The way to increase the penetration ratio can differ as voluntary and compulsory purchase of insurance contracts. However, country experiences show that households do not purchase insurance voluntarily (Mileti 1999). Likewise, insurance penetration ratio of the ZDS system is nearly 18-20% since its introduction. Although this ratio is usually commented as a success comparison with the 5% penetration ratio of earthquake insurance before the ZDS system, it is still below the expected ratio, i.e. at least 60 % in a few years, at the beginning of the ZDS system.

On the other hand, insured housing units concentrate in the populated cities, where the housing units concentrated and which are exposed to higher earthquake hazard. The insured houses in Istanbul amounted 814.094 and constituted 33% of all insured housing stock of Turkey. With 186.727 insured housing units, Izmir shares 8% of the insured housing units in Turkey. Insured housing stock in Ankara, which is the capital city of Turkey and settled in the 4th degree earthquake hazard zone as 295.900 housing units constitutes 12% of insured houses in Turkey. On the other hand, the rates of insured housing units can be followed in the 1st degree hazard zones as in Bursa, Antalya, Kocaeli, Balıkesir, Aydın, and Sakarya. In Tekirdağ, which is settled in 2nd degree zone and in Konya, which is settled in the 4th degree zone, insurance ratio are nearly same. In general, insured housing stock decreases from West to East Turkey. With respect to penetration ratio of ZDS in provinces, highest penetration ratio is found in Yalova, Bolu, Istanbul, Tekirdağ, Ankara, Eskişehir, Muğla, Sakarya, respectively. Although Ankara takes place in the 2nd hazard zone, its penetration ratio as is found as higher than other cities that take place in the 1st degree hazard zone such as Bursa, Balıkesir and Izmir. Indeed, penetration ratio is higher in the west of the country than the cities in eastern Turkey.

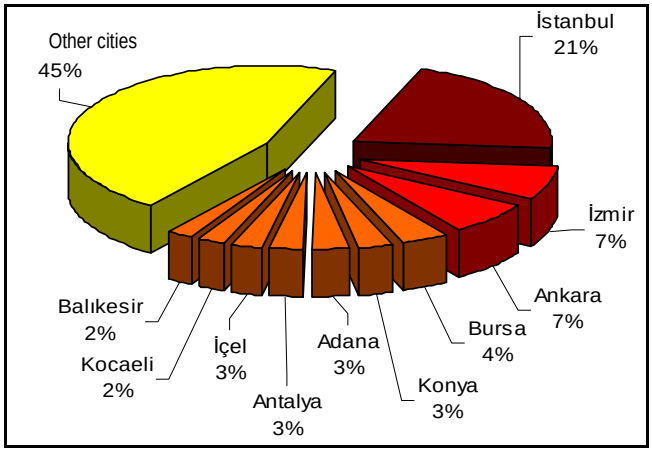


Figure 4.1. Distribution of Housing Stock into Cities

(Source: Building Census, TUIK 2000)

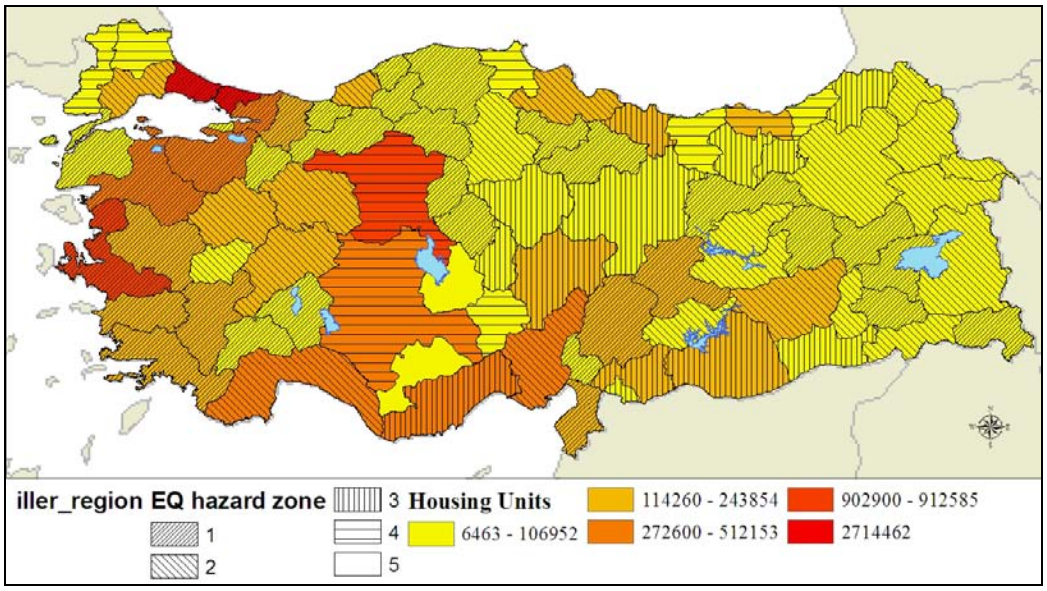


Figure 4.2. Distribution of Housing Stock and Earthquake Hazard Zones

(Source: Produced from Building Census (TUIK 2000) and Earthquake Hazard Map)

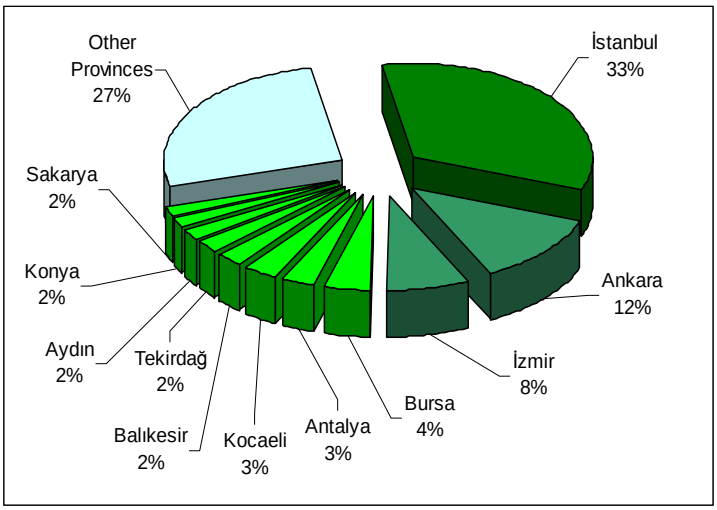


Figure 4.3. Distribution of ZDS Contracts into Cities

(Source: Building Census (TUIK 2000) and DASK 2007)

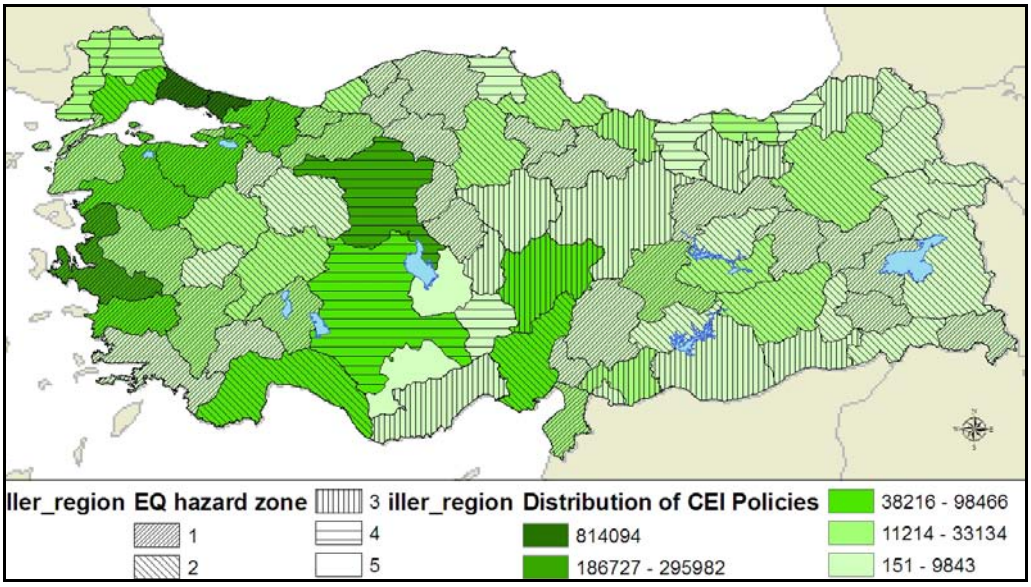


Figure 4.4. Distribution of ZDS Contracts into Provinces

(Source: Produced from Building Census (TUIK 2000), DASK (2007) and Earthquake Hazard Map)

4.1.3. Because risks cannot be estimated accurately and cannot be mitigated, voluntary purchase conditions and the continuing State-aid cause information asymmetry and accumulation of high risks in TCIP

The ZDS system can be threatened with information asymetry problems as adverse selection and moral hazard problems because of 1) voluntary purchase conditions; 2) not distinguishing the earthquake risks in the ZDS Tariff; 3) not encouraging risk mitigation; and 4) continuity of the State-aid; and 5) having no controlling mechanism of insured risks. Adverse selection problem problems arises if the people, who have greater probability of loss than the average, have a tendency to purchase insurance in voluntary conditions (Athearn 1969; Karacan 1994). Indeed, adverse selection becomes a problem in natural disasters, when the premiums set by insurers are scheduled based on the attributes of a broad population (Li 1998). In other words, if insurers lack 'perfect information', emerging adverse selection problem can threat the efficiency of the pool due to increasing proportion of high risks (Hoy 1984*). In ZDS system, however, the premiums in the ZDS system does not reflect the urban risks and building risks. That is, households that have higher risks may be more willing to purchase ZDS contracts in voluntary conditions.*

Moral hazard occurs, if insured people lack prevention and the insurer does not encourage risk mitigation (Athearn 1969; Kohler 1982). Indeed, homeowners are expected to take risk mitigation measures before natural disasters. However, thet usually do not take these measures voluntarily (Lindell and Whitney 2000). Indeed, executing uniform premiums collectively, the insurers cannot encourage risk mitigation (Faure 2006). *However, due to the limits of the ZDS Tariff, households are not encouraged to take risk mitigation measures.* Another reason that causes moral hazard problem can arise from the politically responsive attribute of the State in the case of offering post-disaster aids. Due to considering the interests of voters, the State cannot make effort to control moral hazard. In fact, this response to loss causes governments to not introducing risk reduction mechanisms such as deductibles or co-insurance to the people who are likely to suffer the loss (Priest 2003). However, the post-disaster aid policy of the States does not only dampen the demand for insurance, but also creates reluctance for self-protections and reduces the pressure on local authorities to take public protection measures (Schwarze and Wagner 2007). *In Turkey, however, the State continue to offer State-aid, which can create reluctance for risk mitigation. This, in turn, can influence the efficiency of the ZDS system.*

Insurers can 'monitor' and 'control' the risks to prevent the 'information asymmetry problems', i.e adverse selection and moral hazard, and to provide accurate risk estimation. However, monitoring and controlling of risky behavior and adverse selection is extremely difficult for an insurer once a person is insured. Besides, the collection of information to distinguish risks requires the insurer to invest in considerable expenses (Kunreuther 1998). Being a State entity, however, the ZDS system could use the advantages of the State as described in the Article 12 of the ZDS Decree. Using the information systems of the public instutions could provide the ZDS system to assess and monitor the risks in the un-insured and insured housing stock, because there is constituted no 'monitoring mechanism' in cooperation with other public institutions. Despite, earthquake vulnerability and risk levels of the housing stock cannot be estimated in the existing system. That is, adverse selection and moral hazard problems cannot be monitored. *In other words, the TCIP cannot distinguish the risk of the insured properties. In addition, these risks cannot be mitigated, because there is no other risk mitigation policy in the country.*

This risk classification methodology and lack of monitoring mechanism in the ZDS system can cause the accumulation of high risks in TCIP, because ZDS cannot distinguish high and low risks and assigns actuarially unfair insurance premiums and compensations. The un-differentiated premiums can result in information problems that cause accumulation of high risks and highly correlated risks in the insurance pool. Particularly, if the ratio of high risks in the population is higher than that of low risks (Priest 1996; 2003). In other words, *if the ZDS system cannot prevent the information asymmetry problems, this can result in the inclusion of high risk properties into the TCIP, i.e. insurance pool. the ZDS system can confront insolvency due to inaccurate estimation of losses and accumulation of high risks in TCIP.* Although the earthquake risks cannot be monitored, the distribution of the distribution of the ZDS contracts into high degree earthquake hazard zones addresses the adverse selection problem: 65% are sold in the 1st degree hazard zone, when 14% are sold in the 2nd degree hazard zone. Purchased ZDS contracts in third, fourth and fifth degree hazard zones constitute 4, 17, and 0 % of all ZDS contracts, respectively, according to Building Census (TUIK 2000) and DASK (2007).

4.1.4. Failure of the ZDS System in Risk Mitigation because of inaccurate risk classification and no cooperation with other stakeholders

Although ZDS system determines premiums and compensations through a risk-rated Tariff, the materials and methods in risk estimation do not reflect accurate rates. Therefore, ZDS system cannot select low risks to insure. However, if ZDS system can use accurate risk determination methods, this can produce externalities and social inequalities, because there is implemented no complementary policy to encourage or force risk mitigation. Again, exclusion of high risks may cause low penetration

ratio, because of high fraction of high risks in urban areas. In such a case, implementing ZDS as voluntary or compulsory does not matter, because accurately determined risk-rated premiums can cause low income families to not afford ZDS premiums and risk mitigation. Therefore, increasing penetration ratio and risk mitigation in society can only be achieved through encouraging and, if necessary, forcing risk mitigation, which is possible through complementary policies, i.e. cooperation of ZDS with urban risk mitigation planning and local administrations. Although ZDS has the opportunity to can link two information sources to each other, it does not use this opportunity:

1) Lack of Contractual Methods: Although encouraging risk mitigation was one aim of ZDS, it does not offer any methodology or technique to encourage or force higher-risk homeowners to take risk mitigation measures. The lack of contractual methods does not only cause to obtain accurate information from low risk homeowners, but also can discourage those homeowners to take risk mitigation measures or can cause to take risky activities (moral hazard problem). However, there is implemented neither certain mandates, e.g. high priced premiums, cut-off insurance protection, through accurate risk classifications, nor sanctions to those that do not purchase ZDS. Thereby, higher risk property owners are not forced to mitigate their risks.

2) Lack of Cooperation with Administrations and Stakeholders: Although ZDS has not sufficient capacity to require information and to carry out risk mitigation incentives and mandates, it makes any effort to cooperate neither local administrations, construction firms and inspection firms nor banks that give housing credits to purchase houses. In addition, although ZDS constitute a great resource with large amount of savings from insurance premiums of homeowners, it has any contribution to the mitigation of risks in the higher risk properties. ZDS does not prefer to invest in the improvement.

4.2. VOLUNTARY PURCHASE CONDITIONS, ESTIMATION OF RISKS INACURRATELY, AND LACK OF RISK MITIGATION CAN CAUSE SOCIAL INEQUALITIES THROUGH DIRECT AND INDIRECT EXCLUSIONS FROM THE ZDS SYSTEM

Failure in compulsory implementation causes individualized decisions that can be influenced by several factors. Failure in compulsory implementation can cause indirect exclusions of homeowners in the authorized housing stock because of leaving the purchase of ZDS contracts into individual decisions in voluntary conditions. According to the studies in the field of natural hazards and insurance, households' decision can be influenced by several factors such as risk attitudes, perceived risk levels, socio-economic vulnerabilities, socio-cultural values and perceived behavior and attitudes

of other households. Although these factors are not known because of no study up to now, as a result of voluntary implementation of ZDS system the main exclusions can be observed as:

a. Exclusion of houses at low risk

Because of voluntary purchase of ZDS contracts, households with low-risks can also be excluded from financial protection of ZDS. This can create a fairness problem for low risk people, because they will be excluded from financial protection, although they are likely to be the citizens that obeyed the building codes. In contrast, high-risk people, who did not obey building codes, will be rewarded with financial protection, if they purchase ZDS contracts.

b. Exclusion depending on low risk perceptions

Households with higher-risks can also be excluded from ZDS protection because of their lower level of risk perception, since risk perception is found among the main factors influencing the hazard insurance purchase decisions of homeowners in national experiences, particularly in USA (Palm and Hodgson 1990; 1992a,b).

c. Exclusions depending on low income levels

Due to affordability constraints, medium-low income homeowners can be excluded from ZDS protection, although ZDS attempts to offer affordable premium prices. The GDP per capita across the country is also found as correlated to ZDS purchase (Table 4.1). That is, households with higher income level seem to purchase ZDS, when this difference can be observed in GDP of cities in the country scale. In fact, penetration ratio of ZDS is higher in provinces that have higher GDP per capital. These cities in the first degree hazard zone are: Bilecik, Denizli, Bursa, Izmir, Aydın, Balıkesir, Çanakkale, Kocaeli, Istanbul, Sakarya, Yalova, Muğla, and Bolu. In contrast, penetration ratio of ZDS is lower in cities with lower GDP. These cities in the first degree hazard zone are: Muş, Kahramanmaraş, Hakkari, Siirt, Bitlis, Osmaniye, Hatay, Malatya, Tokat, Çankırı, Karabük, Isparta, Amasya, Kırşehir, and Bartın. In spite of their lower GDP levels, higher ZDS penetration ratio of Düzce, Erzincan, Bingöl, Elazığ and Tunceli can be explained with their earthquake experience int he near past. On the other hand, some provinces with high or low risk do not purchase ZDs contracts in spite of having higher GDP per capita. In spite of the involvement of GDP to ZDS penetration ratio, the proportion of average ZDS premium into average households income in five income levels indicates that ZDS contracts should be affordable by all income levels. In the lowest income level, average ZDS premium constitute only 1.7% of Hh income, whereas other housing expenditures constitute nearly 30% of Hh income in all income levels (Table 4.2).

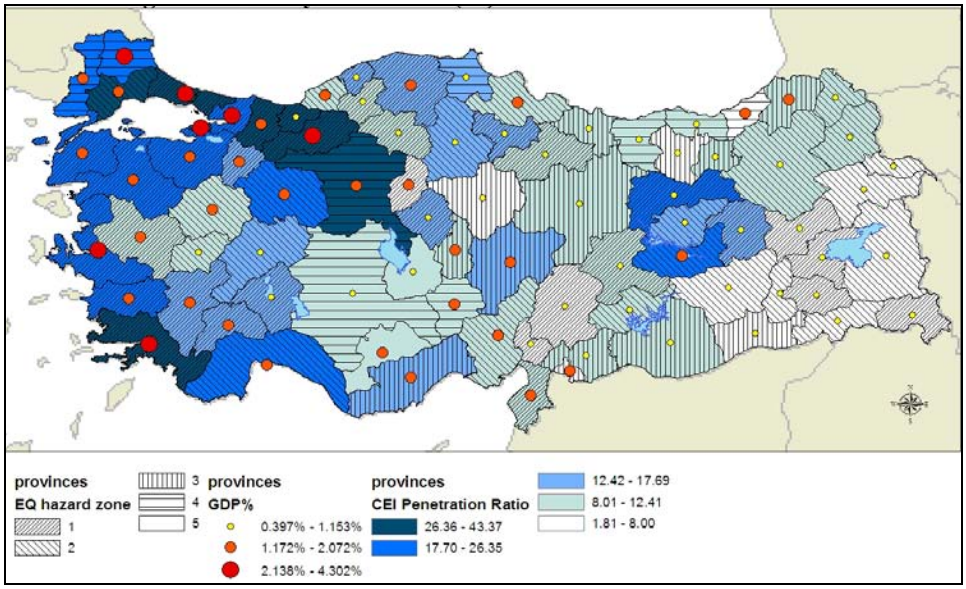


Figure 4.5. GDP Ratio (%) and ZDS Penetration and Earthquake Hazard Zones of Provinces

(Source: Produced from GDP Ratios (TUIK 2008), Building Census (TUIK 2000) and DASK (2007))

Table 4.2. Comparison of Household Income, Insurance Premium and Housing Expenditures
(Source: TUIK 2003; DASK 2003)

	20 % Income Groups					
	1. % 20	*2. % 20*	*3. % 20*	*4. % 20*	*5. % 20*	*Average*
Average Annual Household Income* (Billion TL)	3,67	6,22	8,77	12,57	29,11	12,07
Proportion of ZDS Premium** to Average Annual Household Income*	1,7	1,0	0,7	0,5	0,2	0,5
Proportion of Housing and Rent Expenditures*** to Average Annual Income*	29,7	30,2	29,7	28,6	26,7	28,3

The table is produced for steel or reinforced concrete framed structures in first degree hazard zone.

* State Institute of Statistics of Turkey: Urban Household Income according to 20 % Income Groups by the year 2003

**According to Tariff of DASK, construction value of property for 1 m2 Steel or Reinforced Concrete Framed Structures is accepted as 310 Million TL and annual insurance premium in first degree earthquake hazard areas amounted as 62 Million TL. (DASK, www.dask.gov.tr (05.12.2003)).

*** State Institute of Statistics of Turkey: Consumption Pattern according to 20 % Income Groups by the year 2003

Although there is found no data for assessing relationship of income level with ZDS purchase in Istanbul, higher penetration ratio in certain districts that have higher income level, i.e. Bakırköy, Kadıköy, Beşiktaş and Şişli, also can verify the involvement of ZDS purchase with income level. Particularly, Beşiktaş and Şişli are known as less vulnerable to an earthquake than other districts such as Zeytinburnu and Fatih.

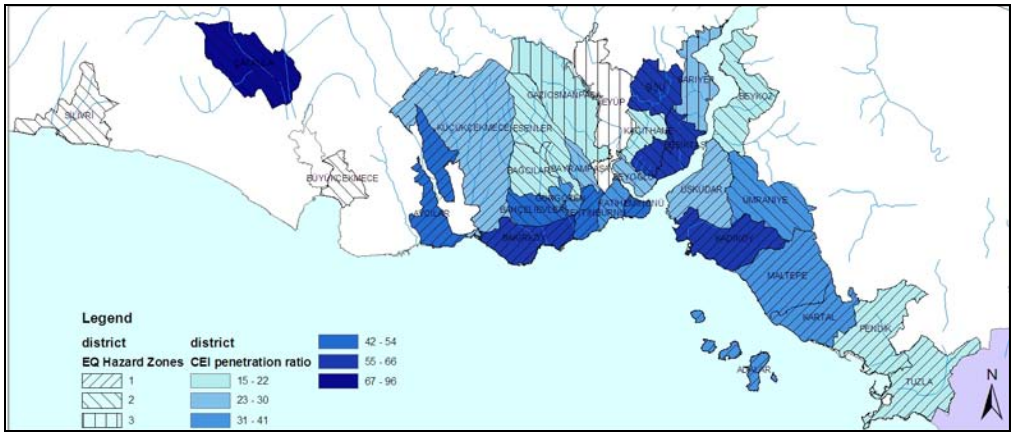


Figure 4.6. ZDS Penetration Ratio (%) in the Districts of Istanbul
(Source: Produced from Building Census (TUIK 2000), IMM GIS Database, DASK (2007) and Earthquake Hazard Map)

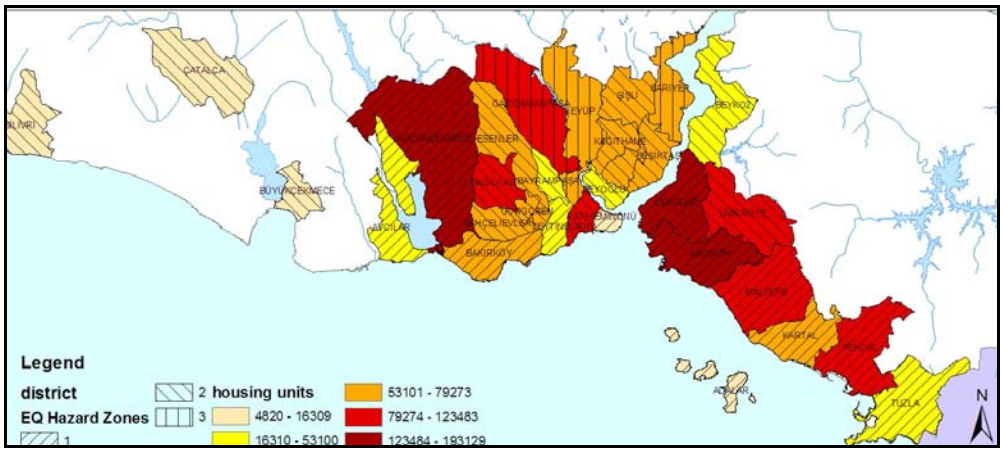


Figure 4.7. Distribution of Housing Units in Istanbul
(Source: Produced from Building Census (TUIK 2000), IMM GIS Database, DASK and Earthquake Hazard Map)

d. Exclusions because of State-aid expectations

The State continues to provide housing assistance for earthquake survivors, although housing assistance by the State to the disaster survivors was refused with the implementation of the ZDS system. In addition, total refusal of the State for housing assistance was intended as the main sanction to promote purchase of the ZDS contracts by the homeowners. Article 11 of the ZDS Decree stated that the responsibility and tasks of the State in the Disasters Law (No. 7269) was abolished for the compensation of losses in the housing stock. However, after the Afyon Earthquake in 2002, the State continued to provide housing credits to survivors in terms of authorizing the Housing Administration of Turkey (TOKI) by adding articles to the TOKI Law (No. 4767). In the case of constituting cooperatives, the survivors of the Afyon Earthquake are offered up to 20.000 million TL housing credits for 20 years and 10% annual interest rate [1]. In 2003, similar conditions are provided to the earthquake survivors after the Tunceli-Pülümür, Izmir-Urla-Seferihisar and Bingöl earthquakes in 2003 in terms of changes in related Laws (Law No. 4123) [2]. However, the country experiences indicates that the availability and the expectation of the housing assistance from private charities and the State constitute another reason of the low insurance demand in voluntary conditions [3]. This syndrome is also called as 'charity hazard' (Schwarze and Wagner 2007). Therefore, the continuity of the State aid in Turkey seem to be another reason of the low penetration ratio of the ZDS system because of expectated State-aid. This uncertainty can decrease the persuasiveness of and trust on the ZDS system, simultaneously, can increase the expectation of the State-aid.

Figure 4.8. Earthquake Houses Constructed by the State (TOKI) in Afyon (Inaz) after the ZDS System
(Source: Afyon Haber 2008)

4.2.1. Inaccurate risk classification causes failure in risk communication, complications in determination of premiums and lack of liabilities

Inaccurate risk classification can also lead households to receive false information signals about their risk levels in both authorized and un-authorized housing stock. In the authorized stock, the inaccurate risk classification can cause to owners of high risk houses to purchase lower price premiums, while they receive false signals about their risk levels, which can prevent them to take risk mitigation measures. In this context, inaccurate risk classificatons can also lead further social problems or chaos:

1) Complications in premiums and compensations: Owners of medium/low-risk houses can be assigned into higher risks and can confront to pay higher premiums, while high-risk type homeowners can pay low-priced premiums. However, after an earthquake, the former can face lower compensation need, when the latter can face higher losses than their compensation amount. In this case of higher risk homeowners have lower income levels, inaccurate premiums can make them afford insurance premiums; but compensation will be insufficient after earthquake.

2) Lack of Liabilities and Organized Irresponsibility: Due to ignorance of building codes and responsibilities for vulnerable building construction and correlation of urban usage risks, there will be no legal and insurance liability for those damages after an earthquake, when insureds are paid only for compensation. This ignorance therefore can lead an organized irresponsibility after an earthquake. However, the houses exposed to usage risks, e.g. neighbour building or LPG station in the near, can lead greater damage than the expected.

Because inaccurate risk classifications are combined with voluntary purchase conditions, there can be confronted further social problems:

1) Complications in perceived responsibilities: Voluntary purchase can cause households to not perceive their responsibility for insurance purchase and risk reduction.
2) Complications in percived controllability of earthquakes and discouraging risk mitigation: Voluntary purchase can influence the formation of socio-cultural values toward the controllability of natural hazards and discourage risk mitigation.
3) Failures in social policies and leaving socially vulnerables at high risk: Although the current premium determination does not use accurate risk information, scientific studies made in metropolitan areas like Istanbul reveals real risk levels. Thus, high income people can move into safer places, whereas the lower income people cannot move and take mitigation measures.

4.2.2. Inaccurate risk communication and lack of social policies for risk mitigation can cause exclusions in the authorized housing stock.

ZDS creates also indirect exclusions in authorized housing stock. Lack of any risk communication toward risk mitigation in terms of incentives or mandates through ZDS causes the individuals to take individualized decisions for risk mitigation. First, households with higher risks can fail to perceive their risks and be reluctant to take mitigation measures because of the individualized decisions. Second, if higher-risk households have also lower income level, they cannot afford to move safer places or to take mitigation measures, because ZDS does not offer any social policy or strategy to provide them mitigation opportunities.

4.2.3. Not promoting risk mitigation causes direct exclusions and indirect inclusions in the un-authorized housing stock

The ZDS system creates direct exclusions, while it includes some of the excludeds in unfair conditions:

1) Direct Exclusions: First, there is offered any insurance policy for the tenant households that can cover the share of tenants for the ZDS purchase or an insurance coverage by ZDS for the contents and personal assets in the houses. Second, the most vulnerable housing stock, i.e. un-authorized stock, is excluded from ZDS system without any opportunity and choice to get the right for financial protection. However, there can be experienced huge loss of lives and great financial losses due to the high vulnerability of this un-authorized housing stock.

2) Unfair inclusions: Un-authorized houses that have land-registry but no construction permission are allowed to purchase ZDS in terms of showing their land-registry, which causes following inequalities. First, the owners of the un-authorized houses are rewarded with the same conditions as authorized houses are rewarded. They have same insurance policies and same compensation amounts as soon as they are assigned into the same risk-classes. In fact, it is also likely to assign an un-authorized house to a low-risk type class because of the imperfect information. Second, while the owners of some un-authorized houses are rewarded with the access into ZDS policies, i.e. insurance protection, others are excluded from not only ZDS system, but also from the State-aid. There is any other social policy to include them into any protection against earthquakes. To include the un-authorized housing stock fairly, i.e. through risk mitigation and legitimization, however, there is offerred any policy or strategy.

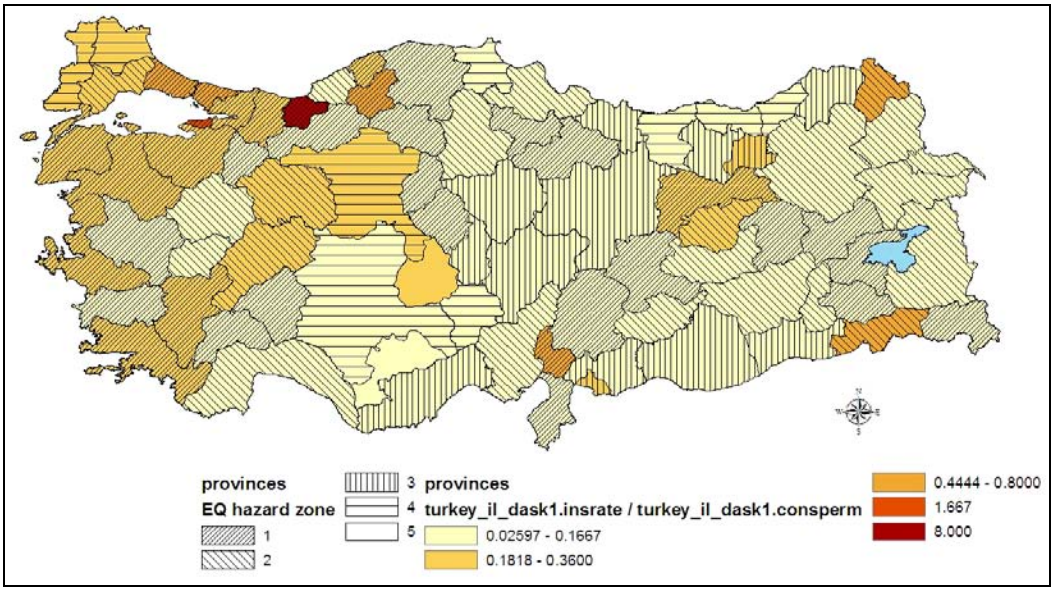


Figure 4.9. Proportion of Insurance Penetration Ratio (%) to Construction Permission Rates (%)
(Source: Produced from Building Census (TUIK 2000), Construction Statistics Database (TUIK 1966-2000) DASK (2007) and Earthquake Hazard Map)

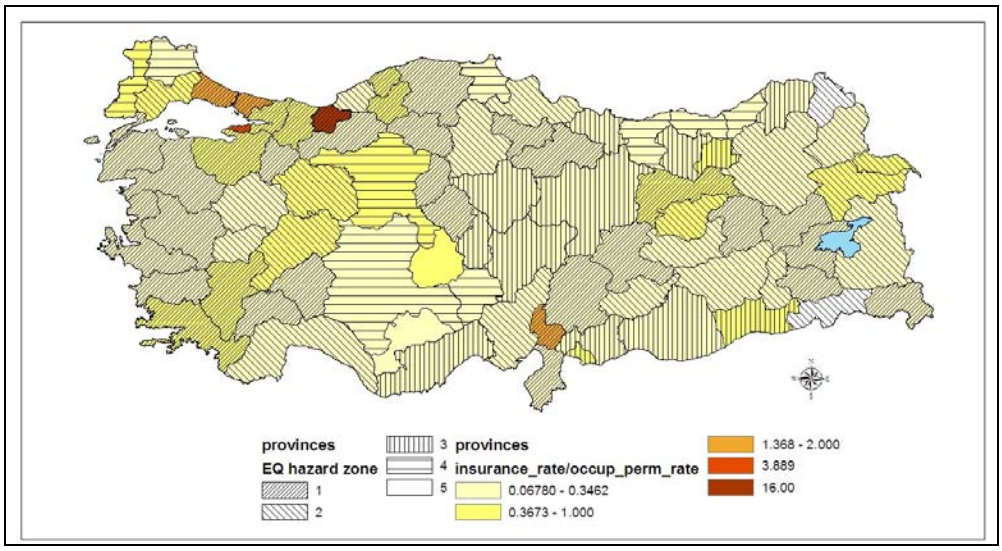


Figure 4.10. Insurance Purchase Rate (%) / Building Use Permission Rate
(Source: Produced from Building Census (TUIK 2000), Construction Statistics Database (TUIK 1966-2000) DASK (2007) and Earthquake Hazard Map)

The ZDS penetration ratio is found as correlated with construction permission, building-use permission and unauthorized housing stock in Turkey (Table 4.1). Indeed, correlation coefficient of 'building-use permission is higher than others'. However, this finding seem to verify that buildings with only construction permission but without building use permission, i.e. unauthorized housing stock (1), could purchase ZDS contracts. On the other hand, second type of un-authorized housing stock, i.e. without any permission, is found also related to ZDS purchase. In addition, cities like Düzce, Yalova and Istanbul can be observed as having higher ZDS penetration ratio than their housing stock with construction permission. In the same way, these cities have also higher ZDS penetration ratio than their housing stock with building use permission. Particularly, owners of unauthorized houses in these cities seem to have purchased ZDS contracts. This failure of the ZDS system was also understood by the homeowners living in apartment buildings that are constructed in the land of Treasury. However, the ZDS system explained that they do not insure this kind of buildings and attempted to repay their premiums that are paid in the last two years (Figure 4.11).

DASK kapsamında olmadıklarını bilmeden prim ödeyenler mağdur edildi

Yanlışın faturası yine yurttaşa çıktı

Zorunlu deprem sigortasının Hazine arazilerinde yapılan inşaatları kapsamadığının ortaya çıkması, kapsama girmediği halde sigorta yaptırarak primlerini ödeyen yurttaşları zor durumda bıraktı. **DASK,** primleri geri vereceğini açıkladı ancak binlerce başvuru olacağını hesaplayarak "2 yıllık zamanaşımı" koydu. Buna göre, 9 yıldır prim yatıran bir yurttaş, son iki yılda ödediği primleri geri alabilecek.

AYKUT KÜÇÜKKAYA

Büyük Marmara depreminin ardından **"zorunlu deprem sigortası"** yaklaşık 9 yıl önce 27 Aralık 1999 tarihinde yürürlüğe girdi. Ancak Hazine arazisi üzerine kurulan yerlerin sigorta kapsamına girmediği yıllar sonra anlaşıldı. Hazine Müsteşarlığı ve Sigortacılık Genel Müdürlüğü'nden görüş talep eden Doğal Afet Sigortaları Kurumu (DASK) **"yanlışlıkla"** yapılan ödemeleri yurttaşa iade kararı aldı. Kendisine yapılan başvuruları değerlendiren DASK, Hazine'nin kuruma gönderdiği **"19 Şubat 2008"** tarihli yanıtını dikkate alarak geri ödemelere **"iki yıllık zamanaşımı süresi"** koydu. Özellikle İstanbul'da Hazine arazisi üzerine kurulan sitelerin, evlerin, konutların sayısı dikkate alındığında çok sayıda yurttaşın deprem sigortası yaptırdığı tahmin ediliyor. Hazine arazisi üzerine kurulu sitelerin yönetimlerinin yaşanan gelişmeden habersiz olduğu ortaya çıkarken; kapsama girmediği hal-

■ *Arkası Sa. 10, Sü. 3'te*

Figure 4.11. The Failure of Insuring the Un-authorized Houses by the ZDS System
(Source: Cumhuriyet Gazzette, 20.04.2008)

4.2.4. Instead of encouraging risk mitigation through estimating risks accurately, the ZDS System prefers to invest in reinsurance

Since high earthquake risk in the housing stock threatens the efficiency of the ZDs system, a great amount of money from the TCIP is transferred from nation to the international financial markets. The financial risks of TCIP can be investigated in certain layers. Each layer shows certain loss intervals, where different insurance and risk transfer tools are used. In the first layer, TCIP will be used to compensate the losses up to US$ 600 million through the accumulation of the ZDS premiums. Those accumulated premiums, i.e. revenues of TCIP, are invested by DASK on the liquit funds to obtain necessary amount of money if needed. In turn, the revenue of TCIP is intended to increase through these funds. If the losses excess the accumulation in the first layer, the World Bank will pay the losses in the second layer of TCIP in the first years of the ZDS system up to US$ 82.5 million.

If the losses are more than the amount in the second layer, 60% of the losses in the third layer will be obtianed from the global reinsurance markets. If this amount is not sufficient, the World Bank will pay the remained losses in this layer and a certain amount of the losses in the fourth layer. The World Bank will provide 'contingent credit' up to US$ 100 million in total. Utilizing from this credit, DASK intend to pay compensation of losses through TCIP even in the case of excessive losses. To obtain this credit, DASK pays a contingent loan through reinsuring itself each year in terms of the World Bank (Linerooth-Bayer et al. 2003; Yazıcı 2005).

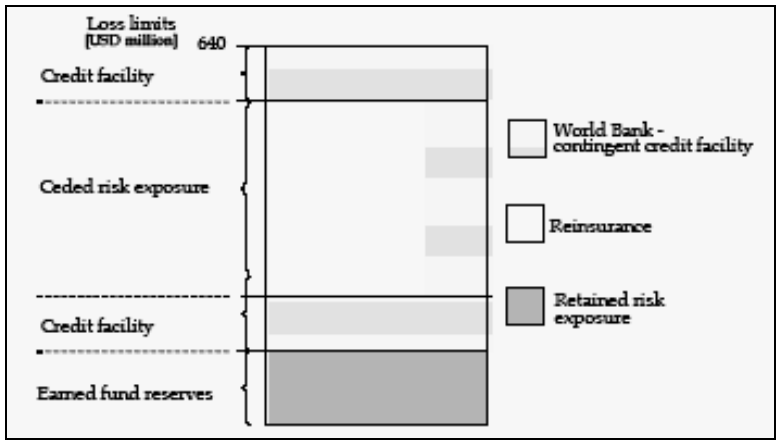


Figure 4.12. A Sketch of the Turkish Catastrophe Insurance Pool (TCIP)
(Source: Andersen 2005)

4.3. POSSIBLE CONSEQUENCES OF CURRENT ZDS SYSTEM

4.3.1. Inefficiency of ZDS System and Created Inequalites

ZDS can confront catastrophic losses, especially because fraction of high risks in housing stock and insured housing stock. In addition, necessary information about risks could not be used. Therefore, ZDS confronts uncertainty and incalculability of risks. Since there is no risk mitigation activity, risks can also increase in time. Under voluntary purchase conditions of ZDS contracts, information asymmetry problems seems to be essential, because there is found significant relationship between ZDS purchase and un-authorized housing stock. However, ZDS system do not use monitoring system. On the other hand, ZDS system fails to create social solidarity and redistribution, when this causes a new kind of inequality. ZDS sytem does not exclude un-authorized housing system, but also certain parts of the country because of lower income level of households. Therefore, ZDS System cannot spread losses across the country, which means that it cannot utilize from cross-subsidization techniques. When the cities that experienced earthquake and at high risk tend to pruchase ZDS, people at medium and low risk are also excluded from ZDS system in voluntary purchase conditions.

Depending on the lower penetration ratio, a great amount of people seems to be excluded from the financial protection of ZDS. In addition, if the people with higher risk purchase ZDS more than others, ZDS can provide compensation only for those high risk people, while the low risk people become unprotected by ZDS. In this case, ZDS can also confront constraints due to high indeminification amount. However, it is also possible that the people with higher risk but low income level cannot purchase ZDS. In each case, these people can expect State-aid. In addition, depending on the unfair determination of premiums and compensations based on inaccurate risk classifications, redistribution can be ineffective. Therefore, people can not receive their rights. Moreover, depending on the unfair inclusion of certain un-authorized houses, fair solidarity between authorized and un-authorized houses fails; and fair redistribution fails. That is, solidarity cannot be provided between low and high risk people, because cross-subsidized redistribution can fail. In fact, while the low income levels can not afford to ZDS premium prices, solidarity between high income and low income people can not be provided by ZDS. As a result, due to the inefficient work of ZDS and due to increasing risks in the physical environment, ZDS can be insolvent and can cause great losses in the social welfare. To finance such a great loss in the housing stock after an earthquake, the burden of the State cannot be decreased. In contrast, the State may have to pay these losses.

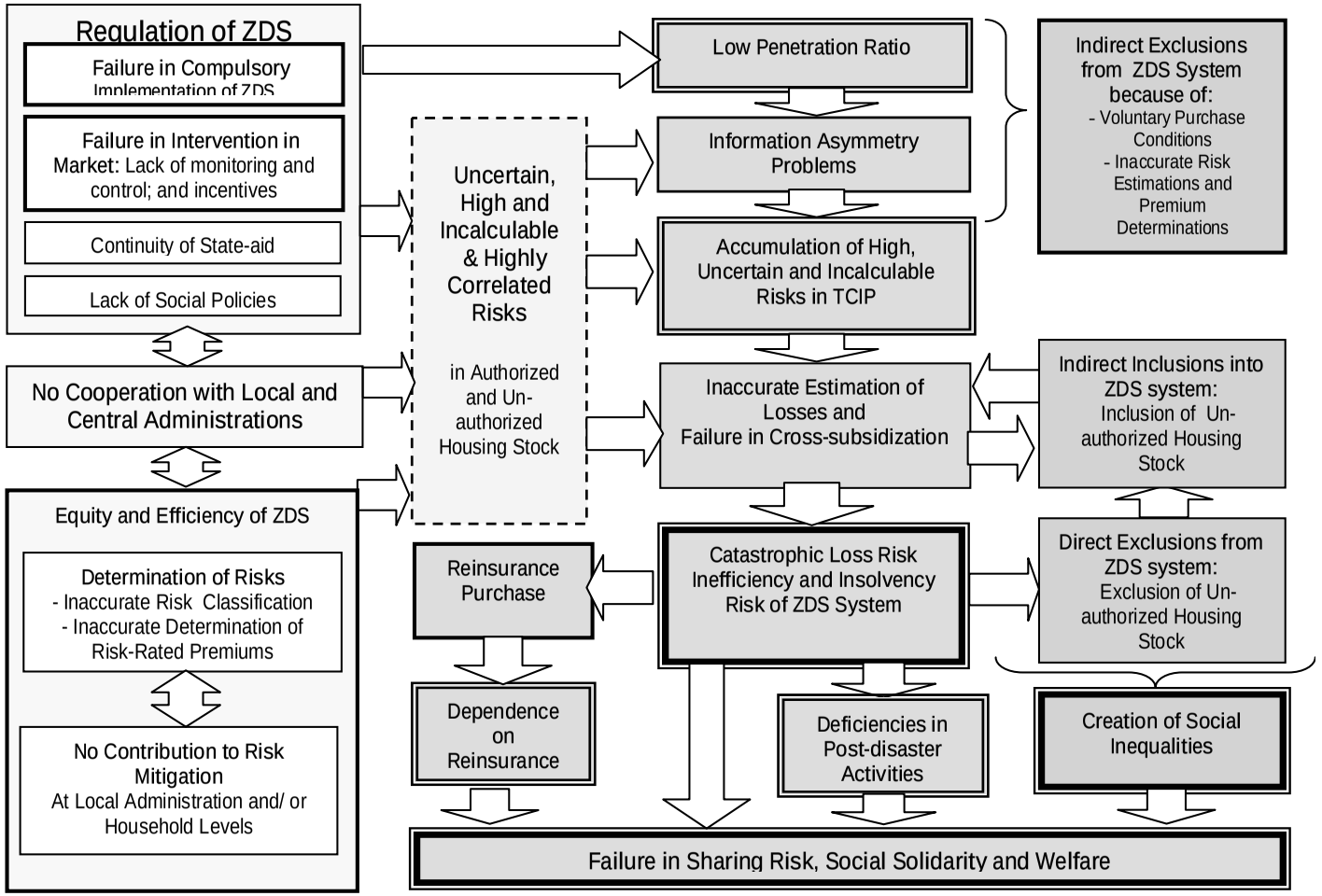


Figure 4.11. Evaluation of Efficiency and Effectiveness of Working Mechanism of ZDS System

4.3.2. Increasing Dependency of the ZDS System on the Global Financial Markets

As a result of paying large amounts to reinsurance, the ZDS system becomes dependent on the global financial markets and cannot be a self-sufficient and sustainable financial risk management instruments. Because the risks are high in Turkey, especially in Istanbul, the reinsurance is bought expensively. According to the Activity Report of the ZDS System (DASK 2008), 46% of its actuarial risk takes place in the first degree hazard zones, when the actuarial risk of Istanbul is nearly 30% of the all actuarial risk of the ZDS system. On the other hand, the paid reinsurance premiums costs nearly 36% of the annual revenue of the insurance premiums, when the commisions paid to insurance companies costs nearly 18% of the annual revenue of the insurance premiums.

Table 4.3. The ZDS System with Numbers
(Source: DASK 2008)

(According to 2007 and 2008 Numbers and Prices)	
Number of Sold ZDS Contracts	2.853.840
Total Compensation (Actuarial Risk)	148.000.000.000 TL
Actuarial Risk in Istanbul	45.895.023.820 TL
Actuarial Risk in 1st Degree Hazard Zones (including Istanbul)	68.761.222.650 TL
Produced Premiums (Premium Revenue)	219.355.000 TL
Average Compensation per House	52.070 TL
Average Premium per House	95.84TL
Paid Compensation (losses)	1.591.351 TL
Paid Commissions to Insurance Companies/ Agents	40.208.268 TL
Paid Reinsurance Premium	79.000.000 TL
Purchased Reinsurance Protection	2.676.000.000 TL (1.250.000.000 Euro)

Hence, investing in reinsurance can have limits and consequences as:

a. The ZDS system can have difficulties to find 'affordable' reinsurance protection due to financial crisis in the global markets and price variations in the reinsurance premiums depending on the increasing natural disaster losses in the world.

b. The ZDS system can have difficulties to be paid by reinsurance due to (1) financial crisis in the global markets and (2) increasing natural disaster losses in the world.

c. Reinsurance seems to be loss from national savings, large amounts of investments by homeowners to be protected from earthquake losses are spent to the temporary, expensive and irreversible measures rather than investing in the housing stock.

d. In the case of reinsurance cannot pay the necessary compensations after a great earthquake, therefore, the State can be forced to pay the losses. Because the State has not any other fund, it has to apply for international banks and organizations for disaster aid.

e. The continuity of the State-aid through international aids, however, can create another dependency on the international arena that is also limited with the increasing disaster losses in the world.

4.3.3. Constraints in Post-Disaster Processes

In the implementation of ZDS, the reconstruction processes after an earthquake is not determined and organized. First, the recounstruction process is uncertain, because the insured homeowners are only paid by compensation, when they are left to individualized decisions for rehabilitation and reconstruction of the buildings. However, the reconstruction process requires policies and strategies to organize and inspect the activities. The experiences in the 1999 earthquakes shows that the homeowners who accept the monetary asisstance instead of constructed buildings from the State, could not be organized themselves and fail to reconstruct their houses. The assisted money became insufficient, when some of homeowners applied to the courts to change the highly-damaged status of their houses in order to continue to live in these houses. In addition, some homeowners gave their houses to renters after inadequate repairs in the damaged houses. Second set of uncertainities arise from the property rights. In Turkey, where the housing stock is constituted apartment buildings, ZDS system is implemented for single units in a building. When the insurance is written voluntarily, few units in one building is likely to purchase insurance. Therefore, the repair of any damage in a building or reconstruction of a building remains uncertain. In the new changes of Flat Ownership Law (FOL), the apartment manager is made responsible for the decision of insurance in the main building, when the homeowners in the building have to obey this decision in accordance with their land share (Article 20). The homeowners in the building, however, can purchase insurance voluntarily, when the insurance mandates are not certain (Aricle 21). If the main building is heavily damaged, the flat ownership rights will expire, when there will be implemented mutual ownership rights on the insurance compensation (Article 47).

4.4. CONCLUSION

The current ZDS system fails to implement the compulsory purchase regulation, when it also could not determine the ZDS premiums accurately. The underlying reason of its failures seems to be the implemented techniques by the ZDS system to deal with the high earthquake risk in the country, which could be un-insurable in market conditions. However, the inappropriate attempts of the ZDS system to identify, assess and calculate risks as well as risk mitigation could cause its inefficiency and insolvency. Investing in reinsurance instead of improving its system and risk mitigation activities, the ZDS system is likely to create loss of social welfare by causing its insolvency, social inequalities and post-disaster State-aid. The current ZDS system in voluntary conditions leaves the ZDS purchase into individualized decisions of homeowners. Its attempt to govern the risks itself as apart from urban risk mitigation and complementary social policies involved with risk mitigation makes homeowners the sole responsibles of risk mitigation, because there is also implemented any other risk reduction policy in the country. When the current ZDS system seems not to result in a resilient society, how the homeowners decide to purchase ZDS and mitigate risks is unknown. To investigate the failures of the ZDS system and find out tendencies of homeowners into various policy options, the next chapter attempts to explain the household survey that is carried out in Zeytinburnu

[1] The source of housing credits was created as 70 billion TL, when the MPWS was authorized as supervisor of this budget, which was to be transffered to TOKI by the Prime Ministry. The number of earthquake survivors that were participated to cooperatives and the number of houses to be offered housing credits were determined as 2.761. Between 2002-2009, the number of constructed buildings in Afyon is accounted as 2149 by TOKI.

[2] The right-owners in the moderately damaged houses were provided a 'Repair and Retrofitting' Credit as 6.000 million TL (TOKI 2009). In Bingöl, nearly 2000 dwelling units are constructed, when the cost per dwelling unit was 42.000 TL.

[3] The penetration ratio in the United Kingdom is very high in private buildings (75%)and in the mortgage credits (95-100%) (Schwarze and Wagner 2007). However, there was no expected public relief, because the State does not offer any aid after natural disasters, when the flood insurance is included into property insurance, automatically. In contrast, this ratio is around 10% in Germany, where the flood insurance is not covered by the property insurance and had to be bought seperately. Similarly, flood insurance ratio is very low in Hungary, where the State compensates 100% of the flood losses (Linerooth-Bayer et al. 2003). Further, although insurance was available in the market as embedded into all risk policies, the density was less than 10% in Belgium (Schwarze and Wagner 2007), because the government was compensating natural disaster losses through a public catastrophe fund as the National Calamities Fund that was established in 1967 (CCS 2008).

CHAPTER 5

METHODOLOGY OF FIELD SURVEY IN ZEYTINBURNU, ISTANBUL

With implementation of ZDS, State aimed to free itself from its responsibility for earthquake loss compensation. Instead, this responsibility is transferred to ZDS system, when only eligible homeowners are obliged to purchase ZDS contracts. Homeowners are responsible for risk mitigation in their houses due to lack of risk mitigaiton and land-use policies. According to the Flat Ownership Law, decision making to take risk mitigation measures (e.g. structural measures such as retrofitting the foundation, strenghtening walls) depends on consensus among homeowners in the building. In other words, collective risk reduction in the country is left to homeowners' decision process in an 'individualized risk management' context. In this context, assessment of decision making process for purchasing ZDS contracts and taking risk mitigation measures is essential to evaluate the existing ZDS system and to develop suitable policies for efficiency and social equity of the ZDS system. For this reason, homeowners' decision process and behavior for purchasing ZDS contracts and taking risk mitigation measures are evaluated in terms of an empirical study. The emprical study was carried out to understand the differences and similarities among the 'Insured Homeowners' and 'Un-insured Homeowners', in a highly risk zone of Istanbul, i.e. Zeytinburnu.

To understand homeowners' decision process in the existing ZDS system, main research questions arise as: What is the relationship between being insured and factors that can influence ZDS purchase? Which factors significantly influence ZDS purchase behavior? Which factors significantly explain the difference in Hhs' ZDS purchase? To investigate the suitable strategy for the ZDS system, the policy options obtained from national experiences, from the theoretical discussions in natural hazard studies and from the discussions and expectations from ZDS system in Turkey are employed. Main research question arises as: "What are the tendencies of Hhs toward alternative policy options for ZDS, risk mitigation measures (RMMs) and post-disaster policies? What is the relationship between ZDS purchase and tendencies toward alternative policy options for ZDS, RMMs and disaster policies?" In addition, the differences in the tendencies of homeowners could also be evaluated in term of the factors that can influence their risk mitigation and purchase of ZDS contracts.

Therefore, various factors could be influential according to the studies in natural hazard and insurance fields on the decision process of Households (Hhs) under uncertainty. Review of these approaches from the new international policy framework, reveals that these varying approches from different disciplines can be integrated in a unitary framework. 'Stakeholder approach' could provide which policy options obtained from theoretical discussions are suitable to Turkey. However, these factors cannot be thought as apart from each other, because all are shaped in a society during social processes and relations. If these factors can be outlined according to their scientific disciplines, three main perspective that are integrated in the theoretical framework of this study can be described as: hazard/technical, social/vulnerability and social construction approach. When each perspective applies different methodologies, they search also different factors as risk perception, social vulnerability (social, demographic and economic factors) and socio-cultural values and beliefs, respectively [Appendix E].

Firstly, individuals/households' decision making process can be influenced by their 'attitudes toward risk' as being 'risk averse', 'risk neutral' or 'risk taking' attributes according to economic theory, which constitutes bases of 'insurance' system. However, further 'technical or hazard' studies in natural disaster field reveals that households decision process can be influenced by their 'risk perception'. Later studies in political ecology and economy, however, revealed that households cannot be thought as apart from society. Indeed, before households, the first level of decision making unit in a society can be described as 'individuals'. However, individuals are linked to the household on basis of their role and power in affecting household decisions. Thus, first level of individual's aggregation is the "household" in a structural and functional position of decision making (Palm 1990).

In fact, decision making and behavior of households are contraint or enabled by the society. First, Hhs are linked to society, i.e. social structure, in terms of their social positions in a class structure, which is determined by 'political-economy'. This determines their access to power and resources as well as other factors at the micro level (Palm 1990). In other words, Households risk mitigation and insurance purchase behavior can be limited by their socio-economic power, which depends on their social positions in a class society, as discussed in 'structural approaches', i.e. political ecology and economy as well as social vulnerability approaches to natural disasters. Second, Hhs' beliefs and perceptions are influenced by 'culture' of society, which in turn can influence their decision process and behavior. This has been discussed in recent "social construction of risk" approaches. Within this context, another social factor that influence Hhs' decision process can be described 'gatekeepers' or 'stakeholders', which have roles and power to carry out tasks in the society (Palm 1990).

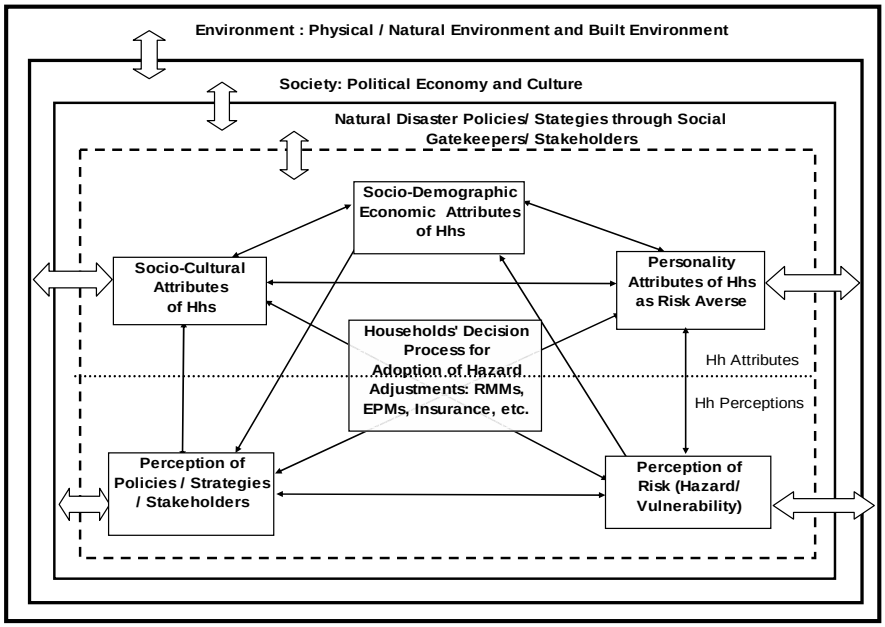


Figure 5.1. Factors Influencing Households' Decision Process under Uncertainty

In this framework, decision making process and behavior of Hhs could depend on:

1- Attitudes toward risk
2- Socio-demographic and economic attributes;
3- Socio-cultural values and beliefs;
4- Perception of natural disaster risk;
5- Perception of imposed power and roles by stakeholders or gatekeepers, i.e. implemented policies and agents/institutions that implement these policies
6- Perceived attributes of stakeholders and gatekeepers
7- Perceived attributes of risk mitigation measures

5.1. STRUCTURE OF QUESTIONNAIRE AND ANALYSES

To conduct analysis in a systematic way, questions in the questionnaire are classified at two levels. At the first level, attributes and perceptions of Hhs' are classified into 5 groups. Attributes of Households (Hhs) encompasses three groups as "Hhs' Socio-Demographic and Economic Attributes", "Hhs' Socio-Cultural Beliefs and Values", "House-Building Attributes". Perceptions of Hhs includes two groups as "Risk Perception of Hhs" and "Perceived Attributes of ZDS and Disaster Policies". In addition, relationship of Realized Behavior and Intentions of Hhs to ZDS purchase is analyzed in terms of four groups as: "General Risk Aversion", "ZDS involved Behavior and Intentions", "RMMs involved Behavior and Intentions", and "EPMs involved behavior and Intentions". At the second level, Policy Options include 3 groups as "Regulation of ZDS Purchase as Compulsory and Voluntary", "Contribution of ZDS into Risk Mitigation" and "ZDS and Post-Disaster Policies". Hypotheses that are conducted for each group can be followed in Table 5.1.

At the first level of analysis, attribute and perception groups are investigated to find out most influential factor in ZDS purchase. Therefore, rising questions involved with homeowners' perception in such a political context are: Are homeowners restricted with their socio-economic and socio-cultural attributes in their ZDS purchase? Do insured and un-insured homeowners differ in perception of earthquake risk? Do insured homeowners perceive responsibilities of institutions, i.e. ZDS system, more than un-insured homeowners? Do un-insured homeowners expect State-aid? Do insured and un-insured homeowners differ in taking RMMs and EPMs? Then, realized behavior and intentions of Hhs are evaluated with respect to their ZDS purchase. However, relationship between attributes, perceptions and realized behavior and intentions are also searched. Finally, multivariate analyses are applied to find out most influential factor on ZDS purchase behavior of Hhs. At the second level, tendencies of Hhs to policy options and differences in these tendencies are searched out through their current ZDS purchase behavior. In addition, relationships between tendencies to different policy options are also regarded. Then, differences in tendencies of Hhs are investigated in terms of their attributes and perceptions.

The analysis expects that "households do not purchase ZDS and do not mitigate their risks due to their perception of ZDS as not compulsory. This leads creation of injustice by strenghtening socio-spatial vulnerabilities". In other words, most influential factor in ZDS purchase decision of homeowners is expected as 'their perception of ZDS as compulsory'. However, homeowners that already purchase insurance as a life-style in voluntary market conditions are also expected to as purchasing ZDS. In addition, education and income levels as indicators of social vulnerability and perception of earthquake risk could be more among insured homeowners. Moreover, homeowners are also

expected to not take risk mitigation measures extensively, whereas insured homeowners can take risk mitigation measures more than un-insured homeowners. Indeed, households are expected to tend toward policy options involved with hypothesis 2 of the study. In other words, insured homeowners could agree with compulsory implementation of ZDS, although un-insured homeowners may expect State-aid. In addition, insured homeowners could agree with contribution of ZDS into risk mitigation because of their higher risk perception, education and income levels.

5.1.1. Attribute and Perception Groups

Group 1 is constituted by 'socio-demographic and economic attributes of Hhs'. Socio-demographic attributes of Hhs are asked in question 1 through 'age', 'sex' and 'education level' of Hh-Heads and 'children' and 'students' in family, 'Hh size' and 'Hh structure'. Economic attributes of Hhs are asked in questionnaire, firstly, in terms of 'occupation' and 'employment status' of Hh-Heads in question 1. 'Hh-Head's occupation' is categorized into seven groups as blue collar workers, retired/house wife, professionals, free, trade/artisanal, clerical and art. Secondly, "Hhs' income" is evaluated through 'income type' in question 2 and 'income level' in question 3. **"**Hhs' income type" is asked in terms of 'wage income' (for the employees of private sector), 'salary income' (for the employees of public sector), 'self-employment income' (for the people who own their business), 'rental income' (for people who earn from their real-estate investments), and 'capital-interest income' (for people who earn from their investments in bank or bonds). "Hhs' income level" is asked in terms of seven categories as: "(1) above 5001 YTL, (2) 5000-2001 YTL, (3) 2000-1000 YTL, (4) 999-751 YTL, (5) 750-500 YTL, (6) 499-201 YTL and (7) less than 200 YTL" (question 3 ([1])).

Thirdly, "Hhs' wealth" is evaluated through 'possessing several housing goods' (question 11) and 'car ownership' (question 13) as indicators of daily luxury goods. In addition, investment and wealth of Hhs are evaluated through their 'owned estates' such as 'house, commercial, depot and land' (question 20). Fourthly, 'expenditure of Hhs' is asked in question 4 in terms of a 5 point *satisfaction scale* ([2]) for nine expenditure types such as 'food, education, house, furniture, insurance, clothing, health, leisure and transportation'. In addition, 'house maintenance expenditure' is asked in question 5. Respondents are expected to write their annual house expenditures such as fixing, care, repair, renewal and renovation except other compulsory expenses such as electricity, water, telephone and house-tax.

	Research Questions	Variables as Factor and Behavior Groups and Hypothesis
Current ZDS system and Disaster Policies	What is the relationship between being insured and factors that can influence ZDS purchase? Which factors significantly influence ZDS purchase behavior? Which factors significantly explain the difference in Hhs' ZDS purchase?	**Hhs' Attribute and Perception Groups** **Group 1**: **Hhs' Socio-Demographic and Economic Attributes**: Hh-Heads' age, income and education level are related with ZDS purchase. **Group 2**: **Socio-Cultural Beliefs and Values**: Egalitarian world-view and sense of belonging are related with ZDS purchase, because of perceiving ZDS as a social solidarity mechanism depending on its perceived attribute as 'compulsory'. **Group 3**: **House-Building Attributes**: Hhs in aged housing stock purchase ZDS more than others depending on perceived risk. **Group 4**: **Risk Perception**: Risk Perception and perceived controllability are related with ZDS purchase. **Group 5**: **Perceived Attributes of ZDS and Disaster Policies**: - Perceived Attribute of ZDS as compulsory is related to ZDS purchase. - Perceived Responsibilities for Protection from Losses and Post-disaster activities for ZDS are related to ZDS Purchase.
	What is the relationship between ZDS purchase and other risk aversion (risk mitigation, emergency preparedness and general security measures) behavior of Hhs?	**Realized Behavior and Future Plan Groups**: ZDS purchase is related with other realized behaviors. **Group 6**: **General Risk Aversion**: Hhs, who purchase ZDS, are also risk averse people in their daily life. **Group 7**: **ZDS involved behavior**: Information search behaviors: Hhs, who tend to purchase ZDS, are more concerned with ZDS through searching information **Group 8**: **Taking RMMS**: Hhs, who purchase ZDS, are more concerned about taking RMMs in the building. **Group 9**: **Taking EPMs**: Hhs, who purchase ZDS, took also EMPs.
Alternative Policy Options for ZDS, RMM and Post-disaster State-aid	What are the tendencies of Hhs toward alternative policy options for ZDS, RMMs and post-disaster policies? What is the relationship between ZDS purchase and tendencies toward alternative policy options for ZDS, RMMs and disaster policies?	**Policy Option Groups**: Hhs tend to favor alternative ZDS and RMMs policies instead of current policies. **Group 10**: **Regulation of ZDS Purchase**: A: ZDS As Compulsory and through a Taxation System, B: ZDS As Voluntary and Incentives **Group 11**: **Coverage, Premium Determination and Risk Mitigation** **Group 12**: **ZDS and Post-disaster Policies**: Hhs, who do not purchase ZDS, tend to voluntary purchase of ZDS because of their State-aid expectation.
	What is the relationship between influential factors of ZDS purchase behavior and tendencies of Hhs toward policy options? Which factors significantly explain the differences among tendencies toward policy options?	**Hhs' Attribute and Perception Groups** **Group 1**: Hhs' Socio-Demographic and Economic Attributes **Group 2**: **Socio-Cultural Beliefs and Values**: **Group 3**: House-Building Attributes **Group 4**: Risk Perception **Group 5**: Perceived Attributes of ZDS and Disaster Policies

Table 5.1. Research Questions and Formulation of Hypothesis according to Structure of Questionnaire and Analyses

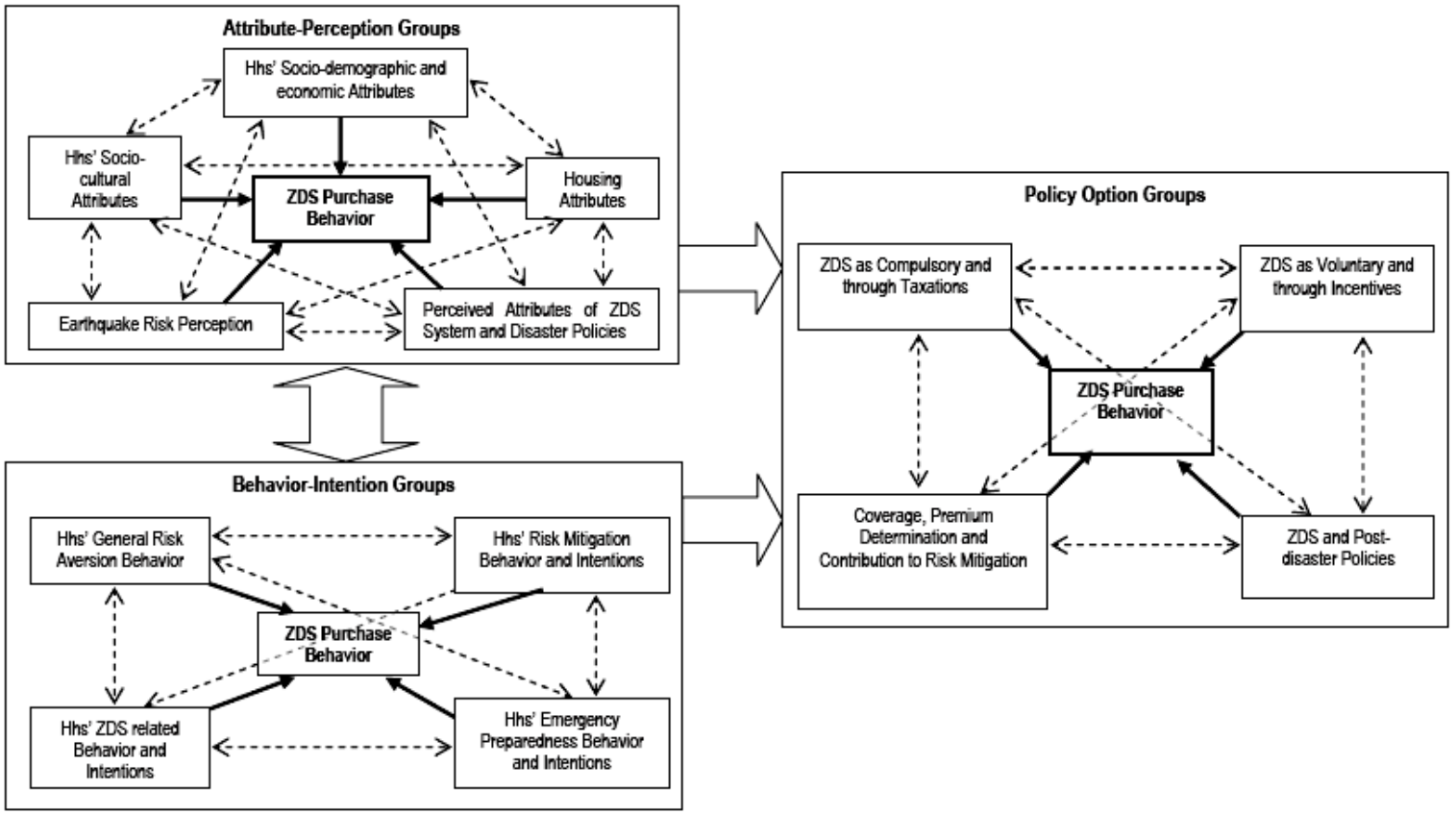


Figure 3..2. Structure of Questionnaire, Hypotheses and Analyses

Group 2, i.e. house and building attributes, are asked in terms of two categories as 'physical and economic attributes of house and building' and 'way of ownership and duration in house'. Firstly, "physical attributes" of house are asked in question 6 through 'size of the house' and number of rooms in the house, when "physical attributes of building" are asked in question 7 through 'number of floors', 'number of apartment units', 'building age', 'structure type' (masonry, reinforced concrete, concrete skeleton, steel and wooden), 'existence and number of commercial and official usages' in the building, 'any change in the structure' of the building and 'existence of car park'. Secondly, "economic attributes" of house and building are asked in question 6 through 'buying and selling value of house' and 'rental value of house'. Thirdly, "involvement of Hhs with house" is asked in terms of their 'way of ownership', 'duration in house', 'expected duration in house' and 'moving plan in the future' in questions 8, 9 and 10. For 'way of ownership', there is used three categories as 'bought', 'inheritance' and 'self-developed'.

In Group 3, 'earthquake risk perception' of Hhs is evaluated with several aspects. Firstly, their perception 'probability' of and 'consequence or loss' from an earthquake are asked in comparison with 'social' and 'individual' levels. For this reason, Hhs' earthquake risk perception is asked in comparison with different events, which are determined through a risk index. This index encompasses 15 events that are categorized in 4 groups: (1) social risks (traffic accidents, fire, burglary, street theft, fraud and terrorism), (2) health related risks (cancer, aids, contagious disease, getting poisoned by food), (3) technological risks (GSM base station, falling into hollows) and (4) natural hazards (earthquake and floods). Therefore, Hhs are asked, firstly, for their perception of risk into society in question 30. They are expected to choose 3 main wide-spread risks to people in Istanbul from risk index. Then, Hhs are expected to compare their perceived earthquake risk probability with other risks in question 31. Besides, this question also provides to compare their perceived probability of these risks to themselves and others in society through Likert scale ([3]). Next, Hhs are asked to evaluated possible outcomes of these events, when they confront (in question 32) through a Likert scale ([4]). Total earthquake risk perception is calculated as average of perceived probability (question 31) and perceived loss (question 32) in database.

Table 5.2. Groups of Potential Influential Factors for ZDS Purchase and RMM Taking

Group 1: Socio-Demographic and Economic Attributes of Households/ Homeowners	1a: Socio-Demographic Attributes of Hh-Head and Hhs: Hh-Heads' Age, Sex, Children in the Household, Students in the HH, Hh Size (Q1); Hh-Head's Education Level (Q1); 1b: Socio-Economic Attributes: Hh-Head's Occupation (Q1); Hh Income Level (Q2); Employment Status (Q1) and Income Type (Q2); Household Wealth and Savings: Luxury Goods at Home, Owning Car, Owning other Estates; Expenditure Related: Satisfaction with Expenditure Types (Food, Clothing, Entertainment, Education, Transportation, Insurance, Health)
Group 2: Socio-Cultural Beliefs and Values	5a: General world-views: hierarchical, egalitarian, individualistic, fatalistic (Q50); 5b: Sense of community and Social Influences (Q50) 5d: Perceived controllability in life (Q50)
Group 3: House-Building & Neighbor. Attributes	2a: Physical Attributes of House and Building: Floors and Number of Units in the Building and Car Park (Q7); Size of the House and Rooms (Q6); Usage and Age of the Building (Q7); Structural System (Q7) and Damage in the Building (Q35); 2b: Market Value of House (Q6): Buying-Selling Value and Rental Value of Houses 2c: Duration of Hhs: Duration in House (Q8); Expected Duration in House (Q9) and Moving Plan (Q10); Way of Ownership (Q6)
Group 4: Risk Perception	3a: General Risks/ EQ Perception: perception of different threats to the society (Q30); Perceived EQ risk to (Istanbul and Zeytinburnu – immediacy, probability, loss- (Q37), perceived EQ risk to near buildings, hospitals, schools, etc. (Q38); 3b: EQ Risk Perception at the Individual Level: perceived probability of different threats (including EQs) to individual (Q31); perceived loss from different threats (including EQs) to individual (Q32); perceived risk from different threats (including EQs) to individual (produced from Q31&Q32); perceived damage to the property (Q37); perceived loss of lives in the building (Q37); perceived safety of building ground/soil (Q39); perceived safety in the building (Q38); perceived monetary loss in the house (Q23); Perceived expected monetary loss to the house goods (Q23); perceived injury level to the body (Q23); Earthquake Experience (Q33,34); 3c: Perceived attributes of / beliefs on EQs (controllability, predictability, etc.) (Q36); 3d: Perceived Attributes of RMMS: Perceived Cost (Q42B-1) and Benefits (Q39; Q42A-3; Q42B) of RMMs; Comparison of Cost and Benefits (Q42A-3)
Group 5: Perceived Attributes of ZDS and Disaster Policies	4a: Compulsory / Voluntary Regulation of ZDS (Q18A,B; Q25; Q27; Q28; 29); 4b: Premiums/ Coverage / Willingness to Pay; 4c: Security Feeling (Q18A); 4d: Perceived Trust: transparency of- ZDS (Q27); 4e: Perceived Roles and Responsibilities: knowledge on where to apply after EQs (Q46); Perceived Responsibility for compensation of losses from EQs (Q48); perceived responsibilities for protection from EQs (Q43); 4f: Ex-post Self- Sources and Credits; 1o: Insurance and ZDS; 1p: Ex-post State-aid (Q24)

Secondly, perception of earthquake risk to 'Istanbul, Zeytinburnu and their building' is asked in question 37 in terms of a Likert scale ([5]). This question also includes 'time dimensions' with items as 'perceived probability of an earthquake in their life and in 10 years' and 'expected loss of life in building' ([6]). Thirdly, 'perceived safety in district' is asked in question 38 through through a Likert scale ([7]). This question includes 'perceived safety of building and other usages in the district'. Fourthly, 'perceived risk to building' and 'opinions about taking necessary measures' in building are asked in question 39 through a Likert scale ([8]). Fifth, 'perceived loss of life, bodily damage and monetary losses' are asked in several questions as 23, 36 and 37. Sixth, Hhs are asked for their 'perception of earthquake attributes' in question 36 through a 5 point Likert scale ([9]). Items in this question are classified into two groups through factor analysis ([10]). First group is called as (1) 'perception of human control for earthquakes', when second group is called as 'de-emphasising earthquake risk' ([11]).

Group 4, i.e. 'perceived attributes of ZDS and disaster policies2, Hhs are asked, firstly, for their perception of compulsory implementation of ZDS and perception of solidarity with ZDS. In addition, their 'trust' on ZDS is asked for 'the use of aggregated premiums in earthquakes or other financial issues of State' [12]. The 'knowledge of the Hhs' about the institution to apply for any damage was asked in the Question 46. In addition, Hhs are expected to explain the institutions they will apply after an earthquake in question 47. 'Perceived Responsibility for protection from earthquake losses' is asked in question 43 through a 5 point Likert scale ([13]). Moreover, 'perceived responsibility for post-disaster activities' is asked in question 48. Hhs are expected to select 3 of given institutions and agents that should contribute to compensation of any damage in the building. Finally, Hhs are asked to choose their 'prior resources for financial compensation of losses' from 6 different options in question 24. Most prior sources are coded with 6, whereas less prior source is coded with 1 so that prior source is assigned with a higher score.

In Group 5, 'socio-cultural attributes' of Hhs are asked through world-view scale items that are constituted by Dake (1991; 1992 cited in Marris et al. 1998) for empirical analysis of socio-cultural theory of Douglas and Wildawsky (1982). These scale items constitute hierarchical, individualistic, egalitarian and fatalistic world-view sentences. In addition, 3 other items are asked to evalaute their sense of belonging. There is used 5 point Likert scale, on which 1 indicates 'strongly diasgree' and 5 indicates 'strongly agree' [14].

5.1.2. Realized Behavior and Intentions Groups

Houseolds were asked about their general risk aversion behavior, behavior and intentions involved with ZDS, already taken RMMs and their future plans, and already taken EPMs and their future plans. Group 6 is about 'general risk aversion behavior' of Hhs. Questions involved with general risk aversion behavior of Hhs includes taken security measures for home (Q14) and automobile (Q13a,b; Q14), and type of purchased insurances (Q19; Q20a).

Group 7 is about their ZDS related behavior and intention of Hhs. In question 18, whether they purchased earthquake insurance for the dwelling unit they occupy If the answer is yes, they were wanted to answer the questions in the sub-section of 18A. If they did not purchase any ZDS they were wanted to continue with the subsection 18B. Sub-section 18A comprised questions for the insured households for three different aims. The first aim was about the information about the insurance policy (the years on which they bought insurance. Second aim was to find out factors influenced the purchase decision of ZDS scaled with 5 points Likert scale. Third aim was to determine future plan of insured households about ZDS (Q5) [15]. Similarly, uninsured Hhs were asked for the factors influenced their current decision as not purchasing ZDS and their plan to buy it in the future. Firstly, factors that might influence declining ZDS purchased were scaled on a 5 point Likert scale. Secondly, the respondents were wanted to denote and explain the reasons of their future plan about buying CEI (Q2). In question 15, Hhs are asked whether they searched information about ZDS or not. If they answered yes, they are requested to explain their information channels. Question 16 tried to find out whether Hhs follow media regularly or read daily news-paper. Question 17 searched information type about ZDS that is needed by Hhs.

Group 8, which is about '**realized risk mitigation behavior'** of Hhs and their '**intentions to take RMMs'** in the future, are asked in questions 39, 40, 42 and 43. Firstly, question 39 asked opinion of Hhs about risk mitigation measures [16]. Attitude toward taking RMMs in the building is asked in question 40. This question is also related to the policy implementation of Flat Ownership Law in the Q41. Whether Hhs have already taken RMMs in the building is asked in question 42. If they had already taken RMMs, they were requested to follow related questions in the subsection of 42A. First question in this subsection requested Hhs to express type of taken measure by giving options. Next question aimed to assess entire cost and share of Hhs for already taken RMMs, which also provides availability and willingness to pay for such RMMs. Third question aimed to determine factors that led Hhs to to take RMMs. Final question was about evaluation of already taken structural measures by Hhs as "sufficient" or "insufficient". If they find them sufficient, they are directed to question 42C. If they find them insufficient, they are directed to subsection 42B. In sub-section 42B, first question

asked Hhs to evaluate some statements in terms of a 5 point Likert scale [17]. These statements tried to find out reasons for not taking the measures or finding already taken measures insufficient. First category was about their observation of neighbors. Second category was about earthquake perception. Third category was about their future plan to move away or not. Fourth category included efficacy variables such as having knowledge or time to take RMMs and perceived attributes of RMMs such as cost of these measures. Other future plans, or intentions, of Hhs to take RMMs are asked in question 42C in terms of a 5 point Likert Scale [18].

Table 5.3. Behavior and Intentions Groups

Group 6: General Risk Aversion	Security Measures for Home (14), automobile (Q13a,b; Q14); Type of Purchased Insurance (Q19; Q20a)
Group 7: ZDS involved Behavior and Intentions	*ZDS Purchase Behavior:* Being Insured or Un-insured (Q18); Being Insured for Other Houses; *Information Search:* Information Sources (Q15,16); Type of Information (Q17); *Future Plan to Purchase ZDS:* Insureds' Plan (Q18A-5), Un-insureds' Plans (Q18B)
Group 8: RMMS involved Behavior and Intentions	Realized Retrofitting in the Building (Q42; 42A); Satisfaction with Retrofitting (42A-4); Knowledge/ Information on the Building Suspection (Q39; Q42A-3); Attitude and Future Plan for RMMs (Q42B-1,2);; 2b: Attitude to Take RMMs: Current Attitude in the Building for Retrofitting (Q40); Perceived self-efficacy (knowledge-time) for RMMS (Q42B-1)
Group 9: EMPS involved Behavioe and Intentions	Realized Behavior and Future Plan for EQ Emergency Preparedness (Q42C)

Group 9 aimed to find out already taken EPMs and future plans of Hhs to take EPMs [19]. Among these EPMs, *structural precautions* related to the home were fastening big furniture, buying fire extinguisher, storing hazardous materials safely, preparing emergency aid kit, stockpiling food and water, buying specific tools and getting first aid education. The *non-structural precautions* were listed as learning how to behave during an earthquake to rescue myself and my kin, learning the necessities to work during rescue, preparing an emergency meeting plan with family, and participating to the studies against disasters in the apartment and neighbourhood.

5.1.3. Tendencies of Households to Policy Options

Policy options encompasses three groups as involved with "regulation of ZDS purchase as compulsory or voluntary", "coverage, premium determination and contribution of ZDS into risk mitigation" and "post-disaster policies". Group 10, is involved with the regulation of ZDS Purchase as Compulsory through effective punishments or taxation systems. F*irst policy option* is about compulsory purchase of ZDS. The items in question 28 asked through a 5 point Likert scale [20] to assess judgments of Hhs were "everyone including people with low risk should purchase ZDS"; "to prepare the society against earthquake, earthquake insurance should be obligatory"; "to oblige the earthquake insurance, the people without insurance should be imposed effective punishments"; "there should be enacted an "earthquake insurance law" that include effective punishments". In addition, question 29 included further items involved with compulsory implementation of ZDS as "there should be implemented monetary punishment for uninsureds; and imprisoning for uninsureds" [21].

Table 5.4. Policy Option Groups

Group 10: Regulation of ZDS Purchase	A: ZDS As Compulsory and through a Taxation System, B: ZDS As Voluntary and Incentives (Q16; Q18A,B; Q25; Q27; Q28; 29)
Group 11: Coverage, Premium Determination and Risk Mitigation	Premiums/ Coverage ; Fairness ; Contribution of ZDS to Risk Mitigation (Q18A,B; Q26; Q27;Q29)
Group 12: ZDS and Post-disaster Policies:	perceived post-disaster responsibility of State for different segments of society- fairness in society- (Q29 and 49)

Next, implementing ZDS through a taxation system is asked in question 28 through statements as "ZDS should be thought as a tax for earthquake"; "ZDS premiums can be reflected to other obligatory payments such as electricity, water, telephone"; and "ZDS can be reflected to the property-house tax". Moreover, question 29 included statement as "requirement of earthquake insurance policy during the payment of electricity, water and natural gases invoices" and "earthquake insurance should be compulsory for the buildings instead of the housing units in the buildings". Then, voluntary implementation of ZDS in question 29 included "people should be encouraged and persuaded to buy insurance voluntarily"; "ZDS should be bought completely voluntarily and it should be a matter of personal choice. No one should be forced to protect him/herself"; and "ZDS should be given to the private sector as independent from State". Moreover, policy options to implement incentives as involved with voluntary purchase of ZDS are asked in this question through statements as "certification of the building each year in the case of all homeowners insured"; "premium discount for

the buildings that renew their insurance policies each year"; "discounted housing tax for the buildings that renew their insurance policies each year".

Group 11, includes coverage of ZDS, way of premium determination and contribution of ZDS into risk mitigation. First, question 26 [22] included statements related to coverage of ZDS and determination of premiums such as "only those with high risk should be forced to buy ZDS"; "people at lower risk should pay lower premiums"; "annual ZDS payments should not change according to risk level"; and "ZDS premiums should differ according to risk level so that homeowners will be encouraged to minimize earthquake risk". In addition, question 28 included further statements as "everyone including people with low risk should purchase ZDS"; and "it is not fair while some purchase ZDS, others do not". On the other hand, question 26 and 28 included further statements related to fairness judgments of Hhs according to ZDS purchase of low and high income level Hhs. These statements were "ZDS should only be compulsory for high and moderate income homeowners"; "It is not fair that low income families at high risk pay full price of insurance"; "If the annual insurance payments are determined according to risk level, it will not favour low income families"; and "State should provide insurance assistance to low income families". Questions about possible contribution of ZDS into risk mitigation and further policies for this contribution were asked detailed in the question 27 with a 5 point Likert Scale [23]. These policy options are evaluated at two levels as "Contribution of ZDS System into Risk Reduction in Turkey" and "Contribution of ZDS to Households for Taking RMMs in the Building".

Group 12, included questions about expectation of State-aid and post-disaster policies. Expectation of State-aid are asked in question 28 through the statement as "if the earthquake insurance is not compulsory, nobody will buy insurance and after an earthquake, everybody will expect State aid." In addition, question 29 included another statement as "State should not assist for housing to uninsureds". Further judgements involved with post-disaster policies are asked in question 49.

5.2. SELECTION OF FIELD SURVEY AREA: ZEYTINBURNU DISTRICT IN ISTANBUL

Istanbul is the greatest metropolitan city of Turkey, which experienced a rapid urbanization and became very crowded since 1980s. The effects of globalization can be observed in Istanbul as creating new urban segregation areas that represent the new social differences. On the other hand, Istanbul is highly exposed to earthquake. This fact became obvious especially after 1999 Marmara earthquakes. However, at that time, the city has almost completed its urbanization process by settling into hazard prone areas under lack of urban planning and building supervision. Thus, the city is also highly vulnerable to earthquake. However, Istanbul is a very big city, where carrying out a

questionnaire survey in its all districts is very expensive. Zeytinburnu can confront immense losses because of a big magnitude earthquake in Istanbul. According to estimations of EMPI, Zeytinburnu is not only close to earthquake fault line, it has also vulnerable housing stock. Indeed, settlement in Zeytinburnu goes back to 16th century. First development of Zeytinburnu started with foundation of tannery at Kazlıçeşme (Evren 2003). The district started to develop rapidly with the declaration of Regulation Belonging to Istanbul Industry Zone, which defined Zeytinburnu as an industry zone in 1947. When the migration from rural areas to urban areas in 1950s resulted in the fast urbanization of Istanbul, development of industrial activities at Zeytinburnu caused immigrants to choose the district as a residential use (Çicek 2005).

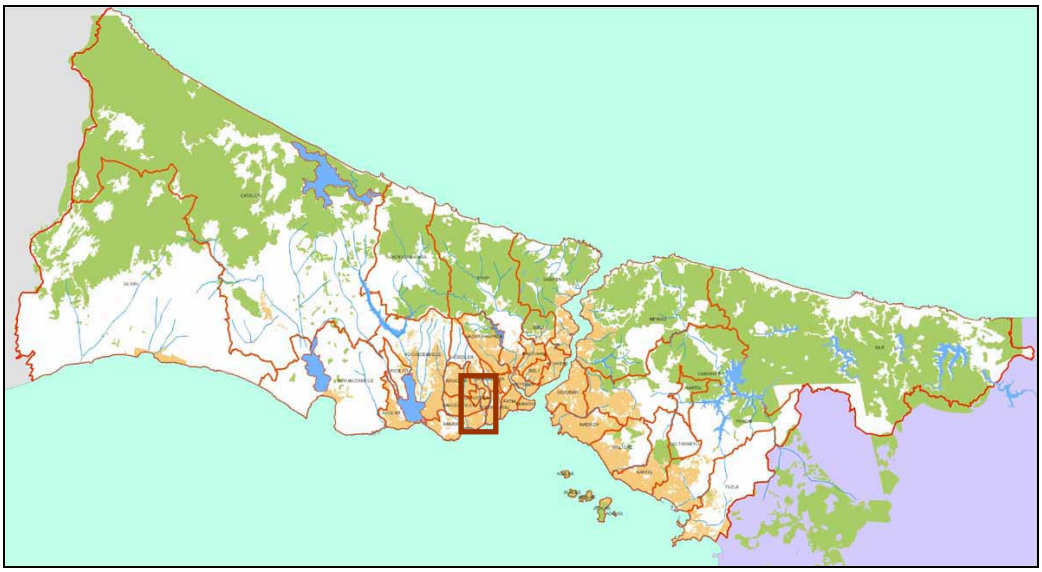


Figure 5.3. Istanbul and the Place of Zeytinburnu (Scale: 1/750.000)
(Source: Reproduced from IMM: GIS Database 2005)

For this reason, almost all houses in Zeytinburnu were transformed from squatter to un-authorized apartment buildings. In addition, socio-economic attributes of Hhs vary in Zeytinburnu to conduct a questionnaire analysis. Another reason of selection Zeytinburnu district is that the district was also its selection for the pilot project area of the Earthquake Master Plan of Istanbul (EMPI). Indeed, reasons of the selection of Zeytinburnu district for EMPI also constituted the reasons of its selection for the field survey of the study. Zeytinburnu, which was transformed from a shanty town to a high rise and dense residential inner city areas, was found in EMPI as highly vulnerable to earthquake and

determined as the pilot project area to carry out action plans of EMPI. Therefore, findings of the field survey of the study aimed to contribute also to the EMPI.

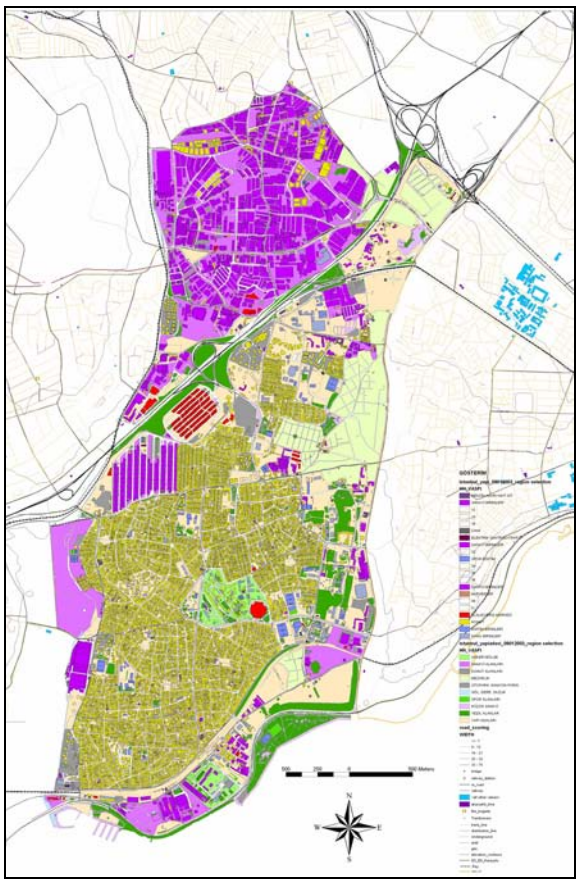


Figure 5.4. Land-Use Map of Zeytinburnu
(Source: Balamir et al. 2004)

5.2.1. Social and Economic Characteristics

Zeytinburnu has a central location in Istanbul as being located at the west side of Historical Peninsula. Marmara Sea exists at the south of the district, at the west Bayrampasa district, at northwest Esenler, at northeast Eyüp, at east Fatih and at west is the Bakırköy and Güngören districts exists. Major railway and highway connections of the city pass through the district. At the north E-5 (D-100), at the south coastal road and railway pass through, besides there is a seaport at the south (Çiçek 2005). According to the survey hold by Prof. Hard in 1962 (Evren 2003), 51.8% of the population was

constituted by the the immigrants from abroad such as Yugoslavia, Bulgaria, Greece and Romania. 48.2% of the population, on the other hand was constituted by immigrants from other regions of Turkey such as Black-Sea region, East Anatolia, Trakya region and Inner-Anatolia regions.

During the last 10 years, in addition to a substantial migration from Eastern and South-eastern Turkey, migrants from Trakya, Afghanistan and Bulgaria were added into the population of the district (Evren 2003). The change in the population of Zeytinburnu can be observed as parallel to the population changes of Turkey and Istanbul. Since 1960's, the population of Turkey is increased as 244% (annually 6.11%), when Istanbul's population is increased more than two times of Turkey's as 533% (annually 13%). During the same period, the population of Zeytinburnu is increased as 277 % (annually 6.9%). It was 89.397 in 1960 and reached to 247.669 in 2000. The first highest population increase is seen between 1965 and 1970. the second highest increase can be seen between the years of 1985 and 1997. The area of Zeytinburnu was within the bundary of Fatih and Bakirköy districts.

However, due to the population increase in the area, it was launched as Zeytinburnu district with new local administration in 1957. Zeytinburnu district is constituted by 13 sub-districts or neighbourhoods as: Beştelsiz, Çırpıcı, Gökalp, Kazlıçeşme, Maltepe, Merkezefendi, Nuripasa, Seyitnizam, Sümer, Telsiz, Veliefendi, Yenidoğan and Yeşiltepe. Among these sub-districts, the oldest settlement area were Sümer, Telsiz, Nuripaşa, Yeşiltepe, Yenidoğan and Maltepe. On the other hand, Maltepe sub-district is the sole one that lost population during time. This is because of the industrial development in the Maltepe area. According to 2000 population census in Turkey, the highest population belongs to Telsiz sub-district. Sümer, Çırpıcı, Beştelsiz and Nuripaşa follows them.

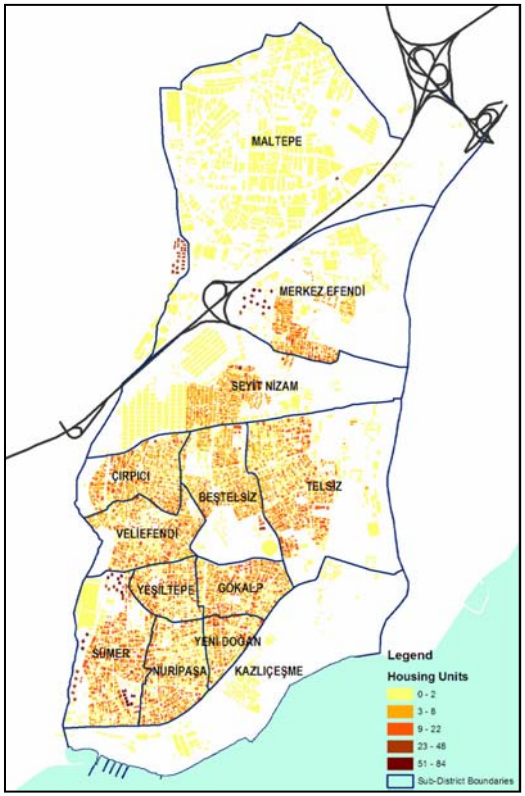
Table 5.5. Population Change in Turkey, Istanbul and Zeytinburnu
(Source: Evren 2003)

	Turkey		Istanbul		Zeytinburnu	
Years	Population	Population Increase (%)	Population	Population Increase (%)	Population	Population Increase (%)
1960	27.754.820	-	1.882.092	-	89.397	-
1965	31.391.421	13,1	2.293.823	21.9	102.874	15,1
1970	35.605.176	13,4	3.019.032	31.6	117.905	14,6
1975	40.347.279	13,3	3.904.588	29,3	123.458	4,3
1980	44.736.957	10,9	4.741.890	21,4	124.543	3,2
1985	50.664.458	13,2	5.842.985	23,2	147.849	16,5
1990	56.743.035	11,9	7.039.190	25,1	165.679	12,1
1997	62.865.574	10.8	9.198.809	25,9	224.768	35,7
2000	67.844.903	7,9	10.033.478	9,1	247.669	10,0

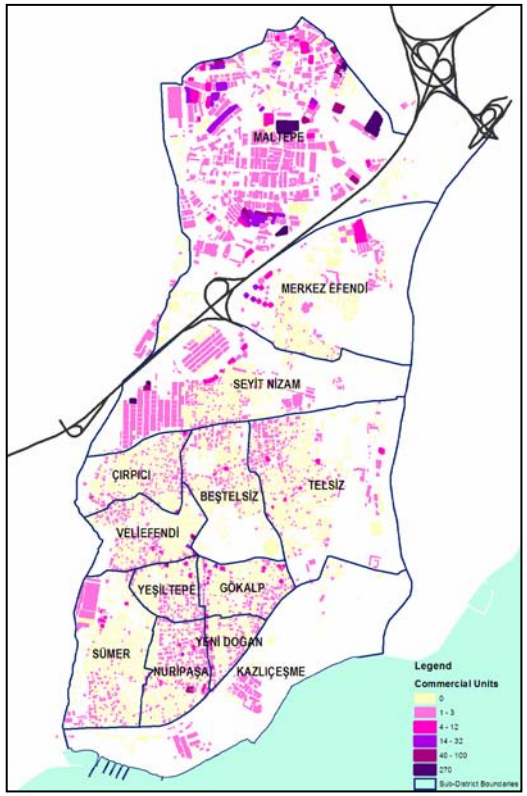
Population density is highest in Yeşiltepe sub-district (832,98 persons/ha). Çırpıcı (662.9 persons/ha), Nuripaşa (622.5 persons/ha), Veliefendi (611.4 persons/ha), Gökalp (591.8 persons/ha) and Yenidoğan (564 persons/ha) can be categorized as second highest population density group. Sümer (464.6 persons/ha) and Beştelsiz (386.4 persons/ha) follows them. Although Sümer and Telsiz have the highest population, when their density is relatively lower than others. Telsiz (250.1 persons/ha), SeyitNizam (160.8 persons/ha) and Merkezefendi (130.2 persons/ha) can be categorized in the third population density group. The lowest population density belongs to Maltepe sub-district (1.41 persons/ha) because of its industrial land-use.

Men constitute 51.3 % of the population, while women constitute 48.7% of the population in Zeytinburnu. The literacy level of men (96.4%) is higher than the women (88.3%). In total, 92.5% of the population is literate (including age of 6 and above). The school education of men is higher than women in all school levels. However, a subtantial amount of the whole population (45%) including men (45.2%) and women (44.9%) has primary school education, while the college/university education has the lowest amount. The employed men in the district were estimated as 100.004, when women are estimated as 95.356. The total employed people in the district amounted 195.360 persons. The population census of 2000, however, estimated the total employed people as 84.278, which is constituted by 64.571 (76.6%) men and 19.707 (23.4%) women.

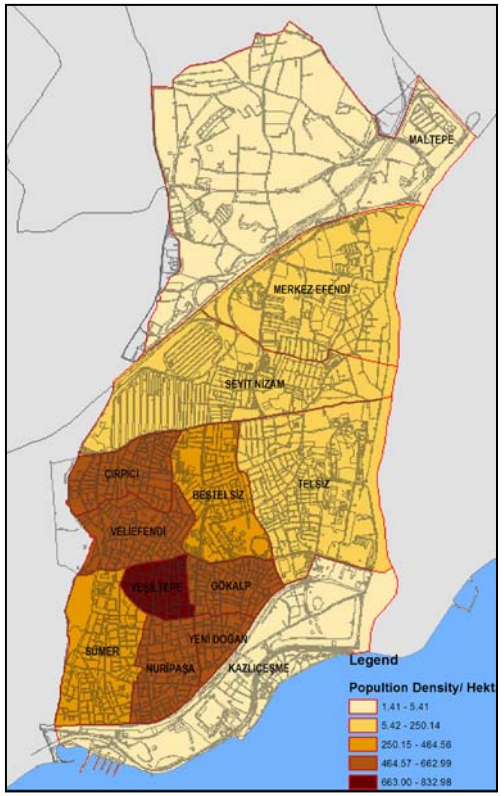
On the other hand, the people that did not participate to the labour force amounted 97.724 (78.2%), while the unemployed amounted as 13.351 persons. 27% and 73% of the former was constituted by men and women, respectively Balamir et al. 2004). On the other hand, 67% and 33% of the latter was constituted by men and women, respectively. In detail, 52.3% of the former group that did not participate to the labour force and whose age is between 15-64 was found as house-wives. However, the unemployment rate for the men whose age varies between 25-49 was found low, while the unemployment rate for the women was found high for all ages (Balamir et al. 2004). According to the survey of IMM (2001), 37% of the employed people in Zeytinburnu are workers, when 15% of the employed people are artisans (Çiçek 2005).



Distribution of House-Units



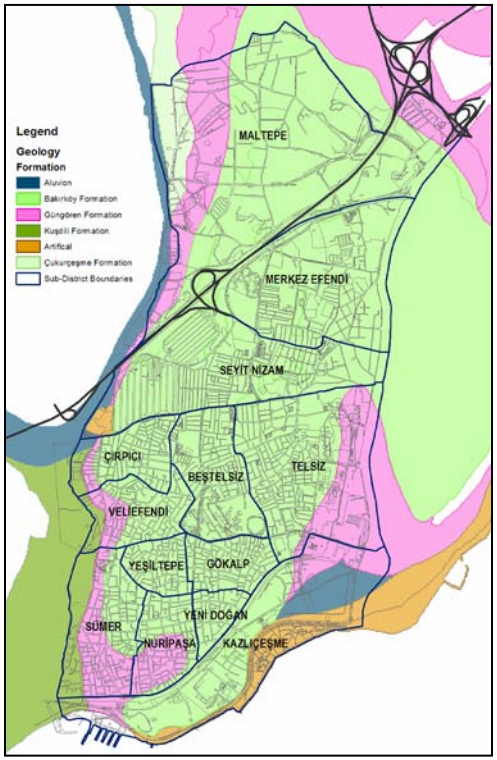
Distribution of Commercial-Industrial Units



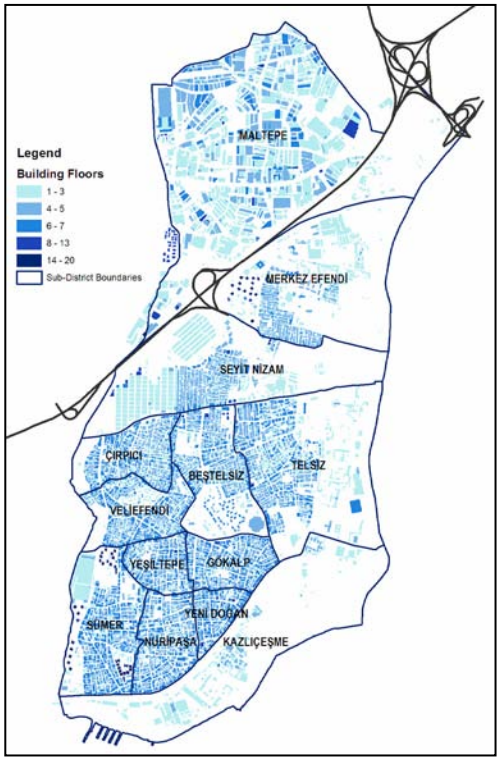
Population Density

Figure 5.5. Distribution of Housing and Commercial Units and Population Density

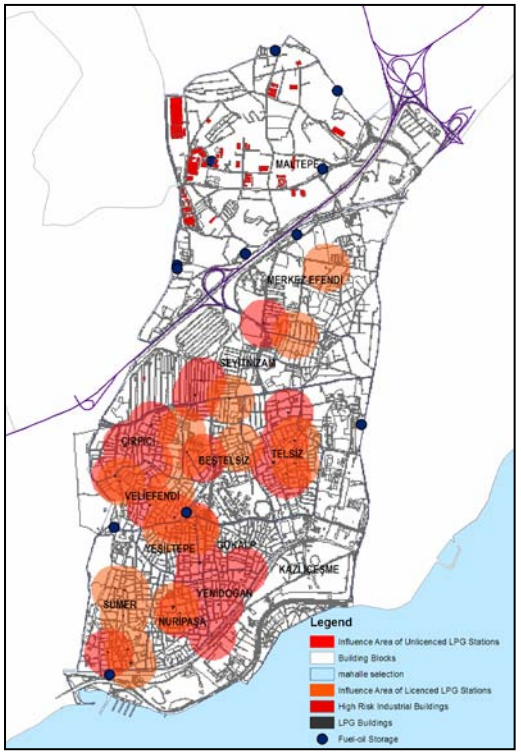
(Source: Reproduced from IMM - GIS Database)



Geological Map of Zeytinburnu



Distribution of Building Floors



Distribution of LPG Stations and Their Influence Area

Figure 5.6. Geological Attributes, Building Floors and Hazardous Materials in Zeytinburnu

(Source: Reproduced from IMM - GIS Database)

Economic activities in Zeytinburnu varies according to spatial characteristics. The dominant economic activity is textile and leather production and their whole, which have the highest added value to the district. The manufacturing activitities take place in the ateliers of the basement floors of house-buildings in Telsiz, Sümer, Nuripaşa, Yeşiltepe, Beştelsiz, Kazlıçeşme and Veliefendi sub-districts. The whole-sale of textile and leather placed in Telsiz and Beştelsiz (Olivium Center). Besides, the automotiv sector take place in Telsiz, Kazlıçeşme and Merkezefendi sub-districts. Seyitnizam district can be characterized with iron-works and transporters place. Maltepe sub-district is dominant with industrial production of steel-iron, chemicals, plastics, shoes, textile, food, etc. and their sales. The Maltepe district, for example, employes 85% of its workers (15.000-18.000 people) from the district. On the other hand, (Balamir et al. 2004).

5.2.2. Physical Characteristics

Although Zeytinburnu started to develop after 1950s, the buildings had experienced transformations during the time. The first house buildings were squatter houses, which were transformed into concrete buildings, when new concrete buildings added to the existing stock, especially after 1980s (Evren 2003). Total buildings in Zeytinburnu amounted 15.432, when 11.069 (72% of total) buildings were constructed after 1980s. The industrial buildings were constructed in Maltepe sub-district before 1980 (Çiçek 2005). In Zeytinburnu district, residential areas constitute 23.6% of the district, whereas the large scale industrial usage constitute 11.3% and small scale industrial usage constitute 6.9% of the total area. Residential areas are located densely between the E-5 highway and coastal road (Çiçek 2005).

The number of housing units in one building that varies between 1 and 6 constitute 67.1% of all housing-units. The number of housing units in one building that varies between 7-13 constitute 28.6% of all housing units. Although there are housing units till 56-84 in one building, their percentage is low (0.2%). Besides, the average number of housing unit per building is 1,4. Large scale industrial areas are located on the north of E-5 high way and on the south of coastal road. Nevertheless, commercial usage and housing usages place together and constitute mixed-usage. Commercial usages take usually place in the ground floor of the main streets (Çiçek 2005). Nearly 99% of the number of commercial and industrial units in the buildings are constituted by 1 – 12 units in the building. The average number of commercial and industrial units per building is estimated as 1. In Zeytinburnu district, 23.6% of the buildings has 5 floors. 16.7% of the buildings has 4 floors and 15.3 % of the buildings has 6 floors. In the district, 3.626 of 15.432 buildings were constructed in unsuitable areas in Zeytinburnu. In other words, approximately 23.5 % of the existing buildings took place in the risky areas (Çiçek 2005).

5.3. DATABASE USED FOR SAMPLING AND CHARACTERISTICS OF INSURED UNITS IN ZEYTINBURNU

The ZDS Database obtained from DASK (DASK 2003) contained information about the ZDS contracts that were in force between the starting date as 18/11/2002 and compilation date as 19/11/2003 in Zeytinburnu district. There was made a contract with then-operational manager of DASK (Milli Re in 2003). Database embraced information about the insurance purchaser (homeowners), insured units and ZDS contracts, which were declared by the insurance purchaser. Information about homeowners contained the name, surname, the contact information was about the neighborhood, main street, street, housing estate or apartment name and number, floor number, post code, township, county, province and phone number. Insured units were recorded with the quarter/ neighborhood, main street, street, housing estate / apartment, building number, dwelling unit number, floor number, post code, township, county, province, building block, plot, building lot, page number, building type, construction year, type of usage, floor amount in building and size of insured unit (m^2).

Information about ZDS contracts included the organization date, starting date, date of completion and contract number. The building type, construction year, floor amount of the building, type of usage and gross size of the insured units were recorded through categories. The categories of building type were as (1) steel/ concrete reinforced/ concrete buildings, (2) masonry stone buildings and (3) others. The categories of construction year were recorded as (1) earlier than and in 1975, (2) between 1976 and 1996, (3) between 1997 and 1999 and (4) later than 2000. The categories of floor amount of the building were recorded as (1) 1-4 floors, (2) 5-7 floors, (3) 8 and above 8. Type of usage categories included (1) housing, (2) commercial, (3) offices and (4) others. The gross size of the insured units were recorded as (1) below 75 m^2, (2) 76-100 m^2, (3) 101-125 m^2, (4) 126-150 m^2 and (5) above 150 m^2.

During controlling the data, some obstacles were confronted. Firstly, during the extraction out of the TCIP database and transformation to the Microsoft Excel file, the rows were disrupted for most of the columns, e.g. under the insured building type column, there could be find the insurance contract date information for one row and for another one the parcel number. All the rows were read, checked and fixed. Secondly, because the characteristic of information that tansferred by the insurance agents were in different forms, some inconsistencies were faced in text-coding system of database. For instance, during the determination of district names, it is observed that the names were written in a different way for each case, e.g. for the (Ziya) Gökalp district as Ziya Gökalp, Z. Gökalp Mh, Gökalp

Mah, Z-Gökalp Mah. The same codification difference is also observed in the street names, e.g. 71. sok, 71 sk, 71. sk, or 71. Each case are controlled and modified to be consistent.

However, the third obstacle led to change the aimed sampling methodology and also evaluation of survey findings. It was the inconsistent parcel /plot and building block numbers with the GIS database of the Istanbul Metropolitan Municipality (IMM). Using the data of IMM and DASK could provide the possibility to show the insured units as visual maps and the evaluation of them within their physical environment. To reach this aim, there were constituted columns in both databases in terms of uniting the building block and plot number variables and they were linked to each other in GIS Arcview Program. The obtained map was compared with the land-use information in the GIS database of Municipality. The information on the output map was inconsistent with the land-use map, e.g. the houses insured were observed in another street or neighborhood, even though their cell information belongs to another. For this reason, this sample selection technique was left.

This failure of database can be firstly because of the slipping during the extraction to excel files. However, some insured housing units are observed in the parcels of industrial buildings, even though they have another addresses. These errors might be due to coding errors during the puchase of ZDS contracts in the insurance agencies.

To prevent confusion with the analysis and information about “insured units” and “buildings”, some explanations are to be made. The information about the buildings in terms of its construction year, construction type, type of usage and floor amount, the given amounts do not mean that there are, for instance, X amount of such kind of buildings. Instead, this means that there were X amount of housing units that are in such kind of buildings. Due to the coding system inconsistencies in the database, however, the amount of all units in the same building can not be calculated, although it might have been known from the IMM-GIS database, if the parcel-block coding were reliable or if there is information for the insured units in the same building.

Information of construction type and year of the units show the information about that of buildings, where the insured units took place. However, there can be more than one insured units in one building:

a) Type of Usages: The insured units in Zeytinburnu amounted 14,841. According to the usage type of insured units in database, there were 12,881 housing units, 1,718 commercial units, 158 office units, and 84 other units. The percentage distribution was 86.8 % for housing units, 11.6 % for commercial units, 1.1 % for office units and 0.6 % for other usages.

b) Construction Type of the Buildings: There were 14,618 (98.5 %) units at steel / reinforced concrete or concrete skeleton buildings, 77 (0.5 %) units at masonry / stone buildings and 146 (1.0%) units at other buildings that is not defined obviously.

c) Building Construction Year: There were 11,166 (75.2%) units at the buildings that were constructed between 1976 and 1996, when 2,254 (15.2%) units were on the buildings were constructed between 1997 and 1999. On the other hand, 791 (5.3%) units were on the buildings, which were constructed earlier than and in 1975, when 630 (4.2 %) units are on the buildings that were constructed later than 2000.

d) Usage and Construction Year: For each usage type, the buildings, where the insured units were located, were mostly constructed in the period of 1976 and 1996. There were 9,632 insured housing units (72.6 % of insured houses), 1,350 insured commercial usages (78.6 % of insured commercials), 123 insured official units (77.8 %of the insured commercials) and 61 insured others (72.6 % of insured others) on the buildings that were built in this period.

e) Usage and Construction Type: The distribution of the usage types of insured units into construction type of the buildings depicted that most of the units were on the steel/ reinforced/ concrete skeleton buildings. The ratio is for housing units as 99.1 %, for commercials as 99.2 %, for offices as 99.2 % and for others as 95.5 %. Insured housing units on these buildings were 10,464, commercial usages were 1,418, offices were 132 and other usages were as 64.

f) Construction Type and Year: The highest building construction rate is seen between the years 1976 and 1996 for each construction type of the buildings. On the other hand, in each year period, the production of steel and concrete buildings is higher than other construction types.

g) Usage, Construction Type and Year: In a more detailed cross table, it is seen that most of the buildings, where the insured units were, were constructed in the period of 1976 and 1996 for each type of usage. For each usage type, the buildings, where the insured units were located, were mostly constructed in the period of 1976 and 1996. There were 9,632 insured housing units (72.6 % of insured houses), 1,350 insured commercial usages (78.6 % of insured commercials), 123 insured official units (77.8 %of the insured commercials) and 61 insured others (72.6 % of insured others) on the buildings that were built in this period.

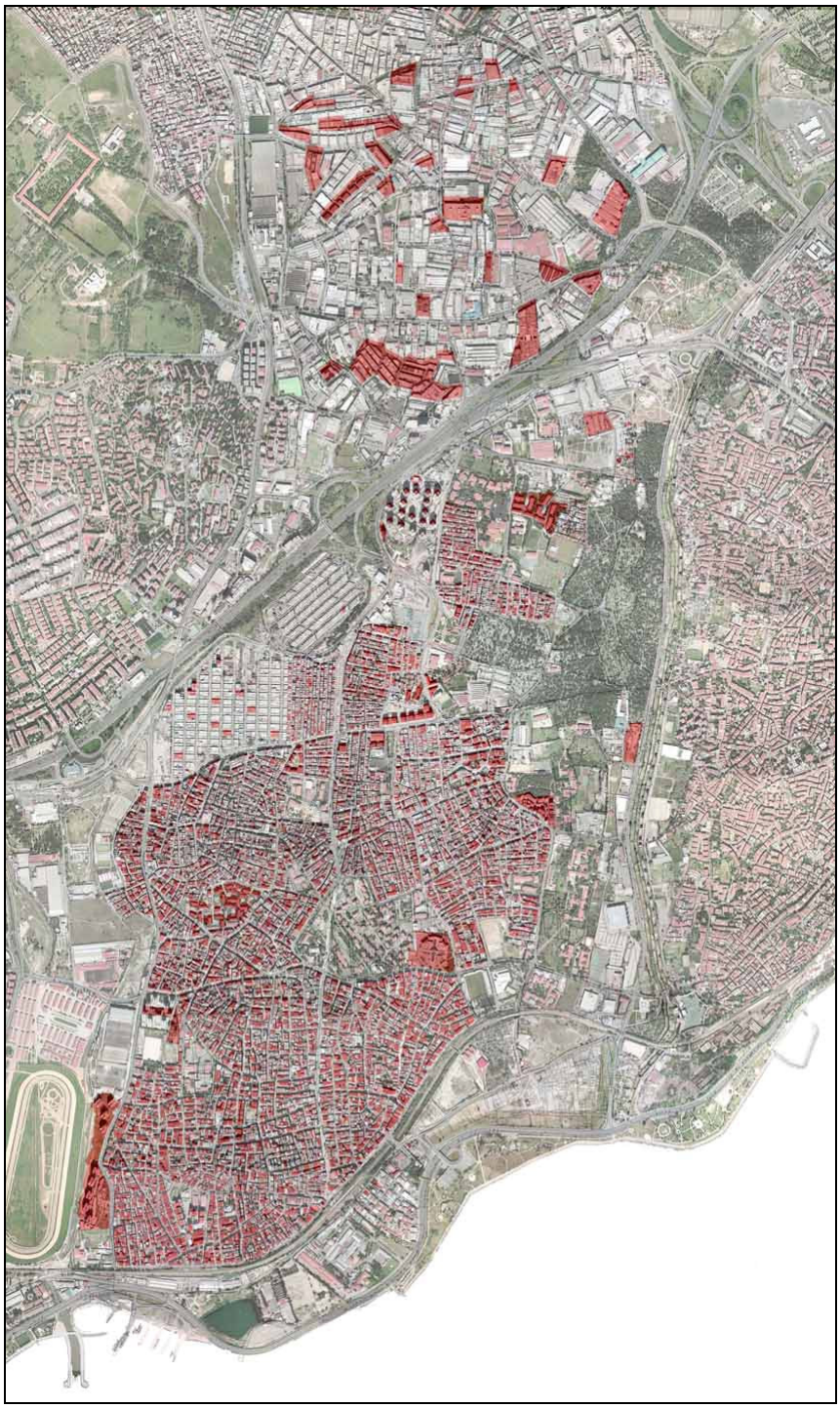


Figure 5.7. Insured Units on Zeytinburnu Satellite Map

(Source: Reproduced in City Planning Graduate Studio of METU using DASK Database, IMM-GIS Database and Zeytinburnu Satellite Map 2004)

Table 5.6. Usage of Insured Units and Construction Year of the Building
(Source: DASK 2003)

Usage of Insured Unit	Construction Year of the Building				Total
	< 1975	*Between 1976-1996*	*Between 1997-1999*	*> 2000*	
Housing	717 *5.6 %*	9,632 *72.6 %*	1,970 *15.3 %*	562 *4.4 %*	12,881 *100 %*
Office	2 *1.5 %*	123 *77.8 %*	27 *17.1 %*	6 *3.8 %*	158 *100 %*
Commercial	65 *3.8 %*	1,350 *78.6 %*	245 *14.3 %*	58 *3.4 %*	1,718 *100 %*
Other	7 *8.3 %*	61 *72.6 %*	12 *14.3 %*	4 *4.8 %*	84 *100 %*
Total	791	11166	2254	630	14841

Table 5.7. Construction Year and Type of the Building
(Source: DASK 2003)

Construction Year of the Building	Construction Type of the Building			Total
	Steel/ Reinforced Concrete/ Skeleton	*Masonry/ Stone*	*Other*	
Before and in 1975	748 *94.6%*	25 *3.2%*	18 *2.3%*	791 *100%*
Between 1976-1996	11,019 *98.7%*	45 *0.4%*	102 *0.9%*	11,166 *100%*
Between 1997-1999	2,227 *98.8%*	6 *0.3%*	21 *0.9%*	2254 *100%*
2000 and After	624 *99.0%*	1 *0.2%*	5 *0.8%*	630 *100%*
Total	14,618 *98.5%*	77 *0.5%*	146 *1.0%*	14,841 *100%*

Table 5.8. Usage of Insured Unit and Construction Type of the Building
(Source: DASK 2003)

Usage of Insured Unit	Construction Type of the Building			Total
	Steel/ Reinforced Concrete/ Concrete Skeleton	*Masonry/ Stone*	*Other*	
Housing	12,685 *98.5%*	66 *0.5%*	130 *1%*	12,881 *100%*
Office	157 *99.4%*	1 *0.6%*	-	158 *100%*
Commercial	1,695 *98.7%*	8 *0.5%*	15 *0.9%*	1,718 *100%*
Other	81 *96.4%*	2 *2.4%*	1 *1.2%*	84 *100%*

5.4. QUESTIONNAIRE SURVEY

The population of questionnaire was determined after several eliminations as the homeowners who are owner-occupied (occupying and possessing the same dwelling unit) and purchased obligatory earthquake insurance in 2003. Furthermore, they are selected as having only one dwelling unit insured. The questionnaire was conducted in 11 neighborhoods of the district Zeytinburnu, where the housing usage is common: Beştelsiz, Çırpıcı, Gökalp, Merkezefendi, Nuripaşa, Seyitnizam, Sümer, Telsiz, Veliefendi, Yenidoğan, and Yeşiltepe.

5.4.1. Determination of the Population and Sampling

Before sampling from the TCIP database, there was required to constitute the sample population, which could serve to the aim of the study. For this reason, there was followed several stages. The steps taken to obtain population for sample are explained below:

1st step: The offices, commercials and others are excluded. The insured dwelling units were obtained as 14,841 units, which have the ratio of 86.6 % of all insured usages in the district.

2nd step: The insureds were determined according to the repeat of their names in the database. It was assumed that the names took place only once were owner occupied, whereas the others, whose names were repeated more than once, were living in one of these units, while rent out other homes. 7796 (82.4%) of them, which had taken place in database only once, were selected. However, other names that were repeating more than one were also investigated. The repeating amount as from 2 to 12, 16 and 35 were found as the individuals, however, with the same information for insured and living addresses. The repeating amount as 44 was found as a business company, when the 91 was found as a housing cooperative name. For this reason, 7887 (61.2% of all insured dwelling units) insured dwelling units the names that were not repeating more than one (7796 insured dwelling units) and the housing cooperative units (91) which was insured by one, name were included, when the others (4994 insured units with 1671 owners) were eliminated.

3rd step: The dwelling units, which had owners living outside of Zeytinburnu (332) and the addresses that were not indicated by owners were eliminated and 6614 dwelling units determined.

4th step: The addresses with any indicator for neighborhood were eliminated and 6384 addresses were obtained.

5th step: The insured unit addresses and homeowner's living addresses were compared to find out the owner occupied dwelling units. The homeowners who live in the insured houses are aimed to select. The homeowners, who have the same address for living and insured home are determined

as *5,789*. Obtained addresses can be summarized as the insured and owner-occupied dwelling units whose owners do not have any other insured house in the district of Zeytinburnu.

The distribution of the dwelling units into 12 neighborhoods in the population data is used for sampling. Since Maltepe is the zone where mostly industries and offices were located, the housing units were rare and the insurance database was parallel to this as 3 units only. Thus, Maltepe was also excluded from sample selection. The sample size from each neighborhood was determined with the ratio of 12 %, which gives totally 694 addresses, because of the aim to reach at least 500 addresses. The survey aimed to distribute nearly 1000 questionnaires as 2 questionnaires in the same building of at least 500 of these sampled addresses. The first questionnaire was to be given to the '*insured homeowner'* that was selected from database, whereas the second questinnaire was to be given an '*un-insured homeowner'*, who lives in the same building.

Table 5.9. Sample Size According to Neighborhoods

Neighborhoods	Insured housing units	Sampling (12 %)
Sumer	1056	61
Telsiz	723	42
Gokalp	608	73
Merkezefendi	569	68
Nuripasa	561	67
Veliefendi	511	41
Bestelsiz	507	127
Yesiltepe	353	32
Cirpici	343	87
Yenidogan	288	35
Seyitnizam	267	61
Maltepe	3	0
Total	*5789*	*694*

5.4.2. Field Survey and Response Rates

During the survey, the interviewers distributed the questionnaires to the determined addresses. Sampled addresses and buildings were indicated on prepared maps, which encompasses the main roads and streets within the neighborhood boundaries. Interviewers were the mostly university graduated white collar employees of Urban Regeneration Office of Bimtas, which was dependent on the Istanbul Metropolitan Municipality. If they could not find the homeowner, or in the case of non-response, refusal and not finding at home, the interviewers attempted to give the questionnaire to another homeowner in the same building, who bought ZDS contracts at least once up to survey time.

Giving the second questionnaire to an uninsured homeowner in the same buildings, the interviewers asked for the help of the sampled insured homeowners. The interviewers were told to explain this introduction:

> "We are coming from Istanbul Metropolitan Municipality. You are selected as a conscious citizenship, because you bought earthquake insurance. We have taken your name from DASK. As you already know our country is exposed to earthquake hazard, as well our city Istanbul. For this reason, the Istanbul Greater Municipality and Middle East Technical University are working together and prepared a questionnaire to protect you and other people from earthquake. It is important to know your thoughts to develop suitable policies. Your name and your identity are confidential and will not be used for other purposes. Do you accept to participate?"

The survey was intended to distribute the questionnaires to the addresses in the sampling lists and gathering back in 3 days. At the beginning of the survey, interviewers were explained about the process and the questions. The survey was carried out 45 days totally. The first field travel was organized in June as 30 days. However, due to time constraints, the survey could not be completed and continued in August, 15 days more. 10 survey takers (including myself) as 5 groups implemented the questionnaire during the week and day-time. During the field survey, 694 addresses were visited as determined by sampling and 565 questionnaires were distributed. 368 of them were accepted by insureds (65.13%) and 224 were accepted by un-insureds (39.65%). During the re-collection, 429 questionnaires were obtained: 250 of them from insureds and 124 of them from un-insureds. However, the filled questionnaires amounted 224 in total, when 168 of them were obtained from insureds and 56 of them from un-insureds. The filled questionnaires constitute 39.65 % of the total distributed ones. The filled questionnaires came back from insured homeowners constitute 29.73 % of the all distributed questionnaires, when the questionnaires gathered from un-insureds constitute 9.91 % of all distributed questionnaires. The questionnaires that could not gathered back amounted 136 (24.07%) of the distributed questionnaires. Insured homeowners that did not give back the questionnaires constitute 20.88 % of all distributed questionnaires, when the uninsured homeowners had the ratio as 17.7 %. The reasons of gathering all questionnaires can be explained as: They could not be found at home; they lost the form; they changed their decision to fill out the questionnaire; they claimed that they did not receive any questionnaire form; and they told that the children tear out the questionnaire form. As a result, the response rate of homeowners was as 34.09 % and 211 questionnaires, whereas the tenants constitute 2.75% of the responses with 17 questionnaires. The

questionnaires gathered from insured homeowners amounted 165 (26.6 %), when the un-insured homeowners amounted 46 (7.43%).

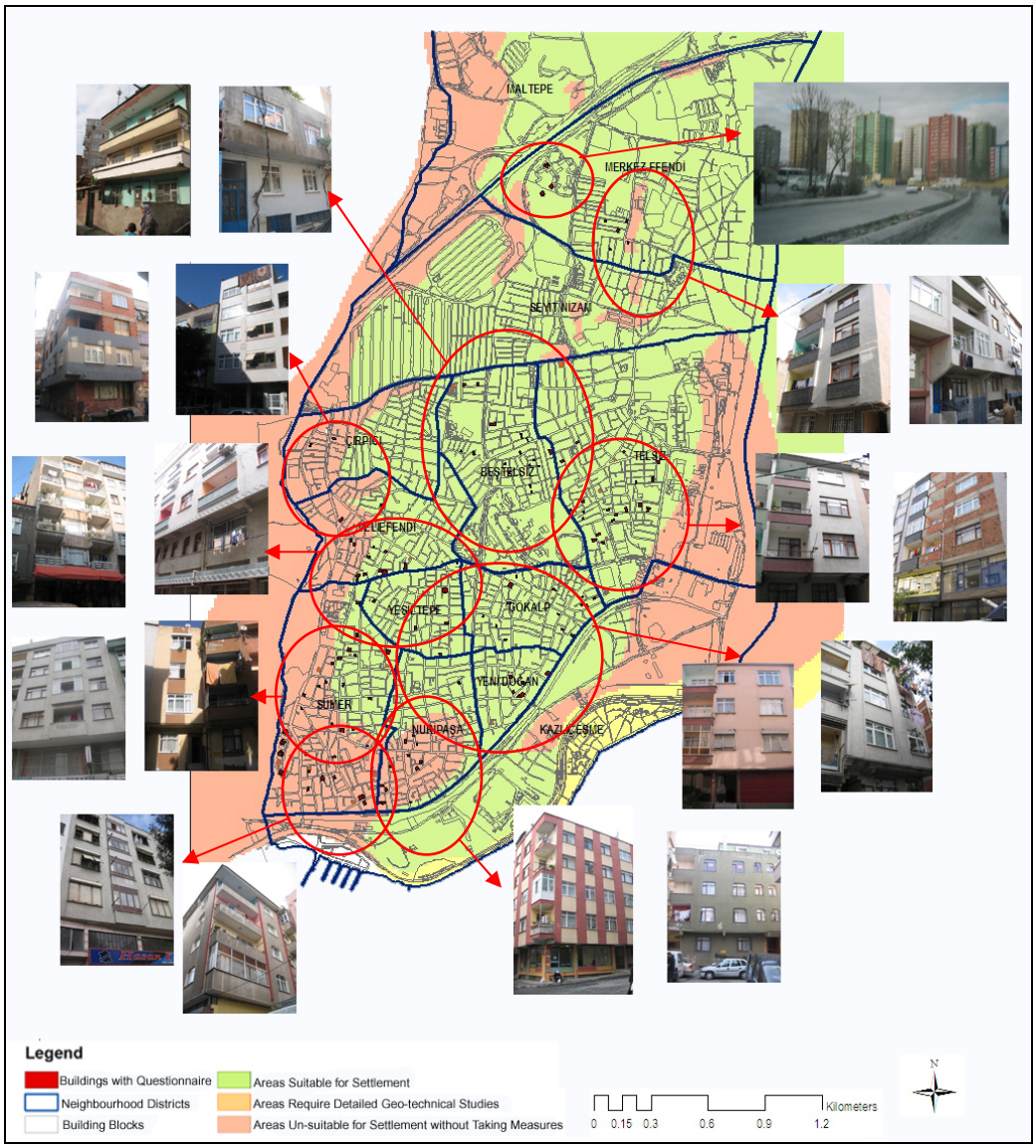


Figure 5.8. The Distribution of the Buildings Participated into the Survey

(Source: Reproduced by DASK Data-base, IMM: GIS-Database and Questionnaire Results; and Photographs by IMM –METU Zeytinburnu Regeneration Project)

[1] This question is visualized in terms of a graphic that is similar to descending stairs, which is expected to prevent the respondents' to show their income level less than reality.

[2] (1) insufficient amount, (2) less than sufficient amount, (3) sufficient amount, (4) more than sufficient amount, (5) much more than sufficient amount. Satisfaction scale with these expenditure types has a good internal consistency with a Cronbach alpha as 0.75.

[3] (1) Especially I can not experience, (2) I can not experience, (3) Everybody can experience, (4) I can experience, (5) Especially I can experience.

[4] (1) Any Loss, (2) Little Loss, (3) Maybe, (4) High Loss and (5) Very High Loss

[5] Although this question is asked in terms of a Likert scale from 1 (strongly agree) to 5 (strongly disagree), this scale is inversed during analysis as from 1 (strongly disagree) to 5 (strongly agree). So that, higher M scores can indicate higher risk perception.

[6] Cronbachs alpha for the scale is found 0.804.

[7] The Likert scale in questionnaire was organized as: (1) very unsafe, (2) Unsafe, (3) uncertain, (4) little safe and (5) very safe. However, this scale is reversed during analyses as: (1) very safe, (2) little safe, (3) uncertain, (4) unsafe, and (5) very unsafe. So that, higher M scores can indicate higher risk perception.

[8] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

[9] Although this question is asked in terms of a Likert scale from 1 (strongly agree) to 5 (strongly disagree), this scale is inversed during analysis as from 1 (strongly disagree) to 5 (strongly agree).

[10] (Varimax rotation is used and items' correlation is found significant accoring to Barlett's test of sphericity test (Chi-square (66) = 315.316, p= 0.000).

[11] Reliability of items is found as 0.725 for the first group and 0.496 for the second group.

[12] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

[13] (1) Any Responsibility, (2) Little Responsibility, (3) Responsible, (4) High Responsibility, (5) Exactly Responsible.

[14] Cronbach's alpha is found as 0.730.

[15] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

[16] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

[17] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

[18] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

[19] Scale items were (1) I have already done (2) I intend to do in the near future (3) I may do (4) I believe not require now (4) I believe never required. Item 1 is used as 'yes – no' question, when other items are reversed during the analysis as item (1) I believe never required to (4) I intend to fo in the near future.

[20] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

[21] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

[22] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

[23] Likert scale in the questionnaire is reversed during analyses as: from 1 (strongly disagree) to 5 (strongly agree).

CHAPTER 6

ZEYTINBURNU FIELD SURVEY: ASSESMENT OF HOMEOWNERS' ZDS PURCHASE AND RISK MITIGATION BEHAVIOR AND THEIR TENDENCIES TOWARD ALTERNATIVE POLICY OPTIONS

As hypothesised in the structure of analyses in Chapter 3, analyses begin with evaluation of attributes, perceptions and behavior of insured and un-insured homeowners/ households (Hhs) to find out the most influential factors of ZDS purchase behavior of Hhs in the context of existing ZDS system and disaster policies. Then, the tendencies of Hhs to different policy options that are obtained from the discussions in Chapter two and three are investigated in the second section of this chapter. Conclusion includes the evaluation of Hhs behavior in the existing ZDS system and their tendencies toward various policy options.

6.1. WHAT INFLUENCES ZDS PURCHASE AND RISK MITIGATION BEHAVIOR OF HOMEOWNERS?

Analyses begin with the declared reasons of ZDS purchase decision by both insured and un-insured Hhs (in question 2). Then, attributes and perceptions of insured and un-insured Hhs are evaluated in terms of their relationship with ZDS purchase. In addition, the differences between insured and un-insured Hhs are also searched out. Secondly, realized behavior and intentions of Hhs are investigated through their relationship with ZDS purchase of Hhs and with other realized behavior. The differences and similarities between insured and un-insured Hhs in realized behavior are also searched out through the attributes and perceptions of Hhs. In the last section, multivariate binomial logistic regression analyses are performed to find out the most influential factors in ZDS purchase. Findings of this section are evaluated at the end of this section before the analyses of tendencies of Hhs toward various policy options.

6.1.1. Declared Reasons of ZDS Purchase by Homeowners

According to questions directed only to insured Hhs (question 18), main reasons of their ZDS purchase was explained by most of the insured Hhs as their 'worry or concern about their family' with the highest score. Again, many insured Hhs thought that worry and concern about their family is too much influential in their ZDS purchase decision. Most of the insured Hhs explained the reason of ZDS purchase as their 'security feeling provided by insurance'. On the other hand, for most of insured Hhs 'damage probability to property' was also another essential reason. In addition, cease of State paying earthquake losses' and 'perceived attribute of ZDS purchase as compulsory' seem to be other essential reasons to purchase ZDS by insured Hhs. However, affordability of ZDS premiums, perceived responsibility of homeowners to purchase ZDS, procedure in the title deed and punishments of ZDS system and affordable ZDS premiums seem to be not influential in their ZDS purchase behavior. On the other hand, In spite of the expected influence of social environment on ZDS purchase, most of the insured Hhs explained that their neighbours and friends have no influence on their ZDS purchase decision (Table 6.1).

Table 6.1. Explained Reasons of ZDS Purchase by Insured Homeowners

		Any Influence	Little Influence	Influential	Very Influential	Too much Influential	Total	Mean
Worry / concern about family	n	10	6	37	21	54	128	3.80
	%	*7.8*	*4.7*	*28.9*	*16.4*	*42.2*	*100*	
Security feeling provided by insurance	n	11	18	44	32	33	138	3.42
	%	*8.0*	*13.0*	*31.9*	*23.2*	*23.9*	*100*	
Damage probability of my property	n	13	15	51	21	32	132	3.33
	%	*9.8*	*11.4*	*38.6*	*15.9*	*24.2*	*100*	
Cease of State paying losses	n	20	14	31	22	34	20	3.30
	%	*16.5*	*11.6*	*25.6*	*18.2*	*28.1*	*100*	
Obligation of ZDS purchase	n	26	16	33	18	25	26	3.00
	%	*22.0*	*13.6*	*28.0*	*15.3*	*21.2*	*100*	
Explanations of scientists	n	22	25	27	20	25	119	3.01
	%	*18.5*	*21.0*	*22.7*	*16.8*	*21.0*	*100*	
Responsibility of the homeowners	n	23	14	35	18	13	23	2.84
	%	22.3	13.6	34.0	17.5	12.6	*100*	
Procedure in the Title Deeds Office	n	38	11	38	8	15	38	2.55
	%	34.5	10.0	34.5	7.3	13.6	*100*	
Punishments of ZDS	n	43	22	25	7	14	43	2.34
	%	38.7	19.8	22.5	6.3	12.6	*100*	
Suitable (affordable) premiums	n	22	28	38	12	16	22	2.76
	%	19.0	24.1	32.8	10.3	13.8	*100*	
Encouragement of my neighbours	n	65	21	16	2	3	107	1.71
	%	60.7	19.6	15.0	1.9	2.8	100	
Encouragement of my friends	n	62	22	20	1	3	108	1.66
	%	57.4	20.4	18.5	0.9	2.8	100	

On the other hand, although many un-insured Hhs explained that 'expensive CEI premiums' were too much influential on their decision to not purchase ZDS. However, some un-insured Hhs told that expensive ZDS premiums has no influence on their decision. Despite, the average of the evaluations indicates that expensive ZDS premiums can be influential. In addition, perception of buildings' vulnerability seem not to influence the ZDS purchase decision of many un-insured Hhs. Despite, some of them seem not to purchase ZDS because of perceiving their building not so vulnerable. However, having insufficient knowledge on ZDS system appears to be an essential reason for some of the un-insured Hhs. On the other hand, low compensation amount seem not to influence their decision. In addition, 'any punishment of ZDS' and 'no monitoring mechanism of ZDS' seem to have little influence on their decision, according to their declarations. Likewise, many of un-insured Hhs also explained that thinking that State will help anyway has no influence their decision (Table 6.2).

With respect to future plans, most of the insured Hhs explained that they will purchase ZDS in the future for their house, where they live and for their other houses. Despite, many of the insured Hhs also explained that they find the compensation amount of ZDS insufficient and ZDS premiums unaffordable. Despite, most of the insured Hhs seem not to give up purchasing ZDS in the future. However, most of insured Hhs were also uncertain to purchase additional earthquake insurance for their houses (Table 6.3).

Table 6.2. Reasons of Not-Purchasing ZDS

		Any Influence	Little Influence	Influential	Very Influential	Too much Influential	Total	Mean
Expensive ZDS premiums	n	8	5	6	5	14	38	3.32
	%	*21.1*	*13.2*	*15.8*	*13.2*	*36.8*	*100*	
Building is strong	n	15	9	3	3	6	36	2.33
	%	*41.7*	*25.0*	*8.3*	*8.3*	*16.7*	*100*	
Insufficient Knowledge	n	16	5	8	1	6	36	2.33
	%	*44.4*	*13.9*	*22.2*	*2.8*	*16.7*	*100*	
Low compensation amount of ZDS	n	18	5	4	2	7	36	2.31
	%	50	*13.9*	*11.1*	*5.6*	*19.4*	*100*	
Other homeowners in the building didn't buy ZDS	n	19	5	4	2	7	37	2.27
	%	*51.4*	*13.5*	*10.8*	*5.4*	*18.9*	*100*	
Any punishment for ZDS	n	15	10	3	1	3	32	1.97
	%	*46.9*	*31.3*	*9.4*	*3.1*	*9.4*	*100*	
Insufficient time	n	19	5	5	2	2	33	1.88
	%	*57.6*	*15.2*	*15.2*	*6.1*	*6.1*	*100*	
Nobody asks whether I bought insurance or not	n	17	8	6		2	33	1.85
	%	*51.5*	*24.2*	*18.2*	*0.0*	*6.1*	*100*	
Not having long term plan in the house	n	19	8	2		2	31	1.65
	%	*61.3*	*25.8*	*6.5*	*0.0*	*6.5*	*100*	
Thought that State will help anyway	n	21	9	3		1	34	1.56
	%	*61.8*	*26.5*	*8.8*	*0.0*	*2.9*	*100*	

Table 6.3. Future Plans of Insured Homeowners for Earthquake Insurance

Statements		Strongly Disagree	Some-what Disagree	Un-certain	Some-what Agree	Strongly Agree	Total	Mean
Willing to re-purchase ZDS every year	n	9	7	15	32	77	140	4.15
	%	*6.4*	*5.0*	*10.7*	*22.9*	*55.0*	*100*	
Willing to purchaseZDS for other owned houses	n	4	7	11	30	40	92	4.03
	%	*4.3*	*7.6*	*12.0*	*32.6*	*43.5*	*100*	
Finding Compensation of ZDS insufficient	n	8	6	21	44	48	127	3.93
	%	*6.3*	*4.7*	*16.5*	*34.6*	*37.8*	*100*	
Finding the ZDS premiums unaffordable	n	13	34	18	37	29	131	3.27
	%	*9.9*	*26.0*	*13.7*	*28.2*	*22.1*	*100*	
Willing to purchase additional EQ insurance	n	15	25	36	28	25	129	3.18
	%	*11.6*	*19.4*	*27.9*	*21.7*	*19.4*	*100*	
Thought to give up ZDS	n	41	40	20	9	12	122	2.27
	%	*33.6*	*32.8*	*16.4*	*7.4*	*9.8*	*100*	

However, most of the un-insured Hhs explained that they do not plan to purchase ZDS in the future (46%), because of having low income levels and children and students at home. They told that their education expenditure are expensive and they cannot pay for ZDS premiums. Most of these un-insured Hhs told also that that were not pleasured to be at this district and they plan to move to another place of the city. high enough (58.3%). Indeed, a few of the un-insured Hhs explained that they will purchase ZDS in the future (13% of un-insureds). Most of these Hhs that seem to purchase ZDS explained the main reason as 'compulsory' regulation of ZDS (33%). Some of them seem to purchase ZDS because they think 'everybody should purchase ZDS', when some of them think they need financial protection from earthquake losses (16% and 16%, respectively). In addition, some of them told that they have no idea about ZDS system. They also told that they can purchase ZDS, if they not know what insurance is (16%).

6.1.2. 'Attributes and Perceptions' of Households and ZDS Purchase

6.1.2.1. Socio-Demographic and Economic Attributes of Households

First, although male Household Heads (Hh-Heads) are observed more than female Hh-Heads among both insureds and un-insureds (Table 6.4), the relationship between Hh-Heads' sex and ZDS Purchase is found statistically no significant [Pearson chi-square (1) = 0.013, p= 0.911]. Second, average age of all Hh-Heads is found as "49.25", when most of Hh-Heads are observed in the third and fourth age groups. Likewise, many insured and un-insured Hhs are also observed in third and fourth age groups. However, more insured Hhs are found in second age category (Table 6.5). Despite, insured Hh-Head's seem to be older than un-insured Hhs in average, even though the difference between ages of insured and un-insured Hh-heads is found statistically no significant [M=49.7; 47.7; t (197) =1.039, p=0.300, respectively]. In addition, both male and female Hh-Heads among insured Hhs are observed as older than un-insured Hhs [M=48; 60 and M=51; 47, respectively].

Table 6.4. Hh-Head's Sex and ZDS Purchase

			Being Insured		Total
			Insured	Uninsured	
Hh-Head's Sex	Female	Count	20	6	26
		% within Being Insured	12.4%	13.0%	12.6%
		% of Total	9.7%	2.9%	12.6%
	Male	Count	141	40	181
		% within Being Insured	87.6%	87.0%	87.4%
		% of Total	68.1%	19.3%	87.4%
Total		Count	161	46	207
		% within Being Insured	100.0%	100.0%	100.0%

Table 6.5. Hh-Heads' Age Groups and ZDS Purchase

Hh-Heads' Age Groups		Being Insured		Total
		Insured	Uninsured	
21-30	Count	3	2	5
	% within Hh-Heads' Age Groups	60.0%	40.0%	100.0%
	% within Being Insured	1.9%	4.4%	2.5%
	% of Total	1.5%	1.0%	2.5%
31-40	Count	33	8	41
	% within Hh-Heads' Age Groups	80.5%	19.5%	100.0%
	% within Being Insured	21.4%	17.8%	20.6%
	% of Total	16.6%	4.0%	20.6%
41-50	Count	55	19	74
	% within Hh-Heads' Age Groups	74.3%	25.7%	100.0%
	% within Being Insured	35.7%	42.2%	37.2%
	% of Total	27.6%	9.5%	37.2%
51-60	Count	36	11	47
	% within Hh-Heads' Age Groups	76.6%	23.4%	100.0%
	% within Being Insured	23.4%	24.4%	23.6%
	% of Total	18.1%	5.5%	23.6%
61-70	Count	19	3	22
	% within Hh-Heads' Age Groups	86.4%	13.6%	100.0%
	% within Being Insured	12.3%	6.7%	11.1%
	% of Total	9.5%	1.5%	11.1%
71+	Count	8	2	10
	% within Hh-Heads' Age Groups	80.0%	20.0%	100.0%
	% within Being Insured	5.2%	4.4%	5.0%
	% of Total	4.0%	1.0%	5.0%

Third, ZDS purchase could be influenced by Hh characteristics such as having more children and students at home and larger or smaller household size. With respect *to number of children*, insured Hhs are observed as having less children, while un-insured Hhs seem to have more children (Table 6.6). This difference can also be observed in terms of the average number of children of insured and un-insured Hhs [M=1.84 and M= 1.61, respectively]. Although having more children seem to influence

ZDS purchase inversely, this difference is found statistically no significant [Mann-Whitney U= 3424, z= -0.806, p= 0.420]. In addition, insured Hhs seem to have more ***students*** than un-insured Hhs (Table 6.7).

This is also obvious in the average number students in insured and un-insured Hhs [M= 1.72 and M=1.55, respectively]. Although having more students in Hhs could influence ZDS purchase directly, its influence on ZDS purchase behavior is found statistically no significant [Mann-Whitney U= 580, z= -1.368, p= 0.171]. Besides, un-insured Hhs seem to have larger ***Hh-size***. More singles and single-parents are observed among insured Hhs, while more nuclear and extended families are observed among un-insured Hhs (Table 6.8). In the same way, average household size of insured Hhs is found smaller than that of un-insured Hhs. Despite, Hh-size is statistically not different among insureds and un-insureds [M=3.55; 3.76, and Mann-Whitney U = 3542.5, z= -0.459, p= 0.646, respectively].

Table 6.6 Children in Hhs and ZDS Purchase

Children in Hh		Being Insured		Total
		Insured	Uninsured	
.00	Count	28	7	35
	% within Being Insured	17.4%	15.2%	16.9%
	% of Total	13.5%	3.4%	16.9%
1.00	Count	48	13	61
	% within Being Insured	29.8%	28.3%	29.5%
	% of Total	23.2%	6.3%	29.5%
2.00	Count	53	14	67
	% within Being Insured	32.9%	30.4%	32.4%
	% of Total	25.6%	6.8%	32.4%
3.00	Count	23	7	30
	% within Being Insured	14.3%	15.2%	14.5%
	% of Total	11.1%	3.4%	14.5%
4.00	Count	8	3	11
	% within Being Insured	5.0%	6.5%	5.3%
	% of Total	3.9%	1.4%	5.3%
5.00	Count	1	1	2
	% within Being Insured	.6%	2.2%	1.0%
	% of Total	.5%	.5%	1.0%
6.00	Count	0	1	1
	% within Being Insured	.0%	2.2%	.5%
	% of Total	.0%	.5%	.5%

Table 6.7. Students in Hh and ZDS Purchase

			Being Insured		Total
			Insured	Uninsured	
Students in Hh	1.00	Count	33	13	46
		% within Being Insured	46.5%	65.0%	50.5%
		% of Total	36.3%	14.3%	50.5%
	2.00	Count	26	5	31
		% within Being Insured	36.6%	25.0%	34.1%
		% of Total	28.6%	5.5%	34.1%
	3.00	Count	11	1	12
		% within Being Insured	15.5%	5.0%	13.2%
		% of Total	12.1%	1.1%	13.2%
	4.00	Count	1	0	1
		% within Being Insured	1.4%	.0%	1.1%
		% of Total	1.1%	.0%	1.1%
	5.00	Count	0	1	1
		% within Being Insured	.0%	5.0%	1.1%
		% of Total	.0%	1.1%	1.1%
Total		*Count*	*71*	*20*	*91*
		% within Being Insured	*100.0%*	*100.0%*	*100.0%*
		% of Total	*78.0%*	*22.0%*	*100.0%*

Table 6.8. Household Structure and ZDS Purchase

			Being Unsured		Total
			Insured	Uninsured	
Household Structure	Single	Count	12	3	15
		% within Being Insured	7.5%	6.5%	7.2%
		% of Total	5.8%	1.4%	7.2%
	Single-parents	Count	16	4	20
		% within Being Insured	9.9%	8.7%	9.7%
		% of Total	7.7%	1.9%	9.7%
	Nuclear	Count	113	33	146
		% within Being Insured	70.2%	71.7%	70.5%
		% of Total	54.6%	15.9%	70.5%
	Extended	Count	20	6	26
		% within Being Insured	12.4%	13.0%	12.6%
		% of Total	9.7%	2.9%	12.6%
Total		*Count*	*161*	*46*	*207*
		% within Being Insured	*100.0%*	*100.0%*	*100.0%*
		% of Total	*77.8%*	*22.2%*	*100.0%*

Fourth, ZDS purchase could be influenced by Hh-Head's education, because Hhs in higher education level might perceive ZDS purchase more necessary. Indeed, education of Hh-Heads is found as directly related with their ZDS purchase behavior at a statistically significant level [Pearson chi-square (2) = 6.968, p= 0.031]. In detail, most Hh-Heads -among both insureds and un-insureds- are observed as having 'primary school education'. However, many Hhs among insureds are also

found in medium and higher education levels, while less Hhs among un-insureds are observed in medium and higher education levels (Table 6.9). Further, comparison of average education of insured and un-insured Hhs also indicates that insured Hhs have higher education level than un-insured Hhs, when significance of this difference is verified statistically [M= 8.433; M= 6.90; and Mann-Whitney U = 2518, z= -2.341, p= 0.019, respectively].

Fifth, **income level, savings and wealth** of insured Hhs are expected to be more than un-insured Hhs. However, there is found statistically no significant relationship between income level and ZDS purchase [Pearson chi-square (6) = 11.259, p=0.081]. In spite of this fact, more insured Hhs than un-insured Hhs are observed in higher income levels. Many insured Hhs have income between 750 and 2000 YTL, whereas many un-insured Hhs have income between 1000 and 500 YTL (Table 6.10).

On the other hand, average income of all Hhs is found as lower than the average income of insured Hhs (M=1225 YTL and M=1258 YTL, respectively). In addition, average income of insured Hhs is found more than average income of un-insured Hhs, when significance of this difference is verified statistically [M=1258; M= 1102; and Mann-Whitney U= 2241.5, z= -2.356, p= 0.018, respectively]. Certain ***'income types'*** could influence ZDS purchase. Hhs with 'wage and salary income' type are expected as purchasing ZDS, because of having regular and higher income. Indeed, '***salary income***' is common income type among both insured and un-insured Hhs (55% and 50%, respectively). However, average salary income of insured Hhs is found lower (Table 6.11), when salary income has no significant relationship with ZDS Purchase [Pearson chi-square (1)=0.363, p= 0.547].

Table 6.9. Hh-Head's Education Level and ZDS Purchase

		Being Insured		Total
		Insured	Uninsured	
1.00 illiterate, literate, primary school	N	69	29	98
	% within Being Insured	45.4%	64.4%	49.7%
	% of Total	35.0%	14.7%	49.7%
2.00 Secondary school	N	23	8	31
	% within Being Insured	15.1%	17.8%	15.7%
	% of Total	11.7%	4.1%	15.7%
3.00 High school	N	32	5	37
	% within Being Insured	21.1%	11.1%	18.8%
	% of Total	16.2%	2.5%	18.8%
4.00 College, university, master, doctoral degree	N	28	3	31
	% within Being Insured	18.4%	6.7%	15.7%
	% of Total	14.2%	1.5%	15.7%
Total	*N*	*152*	*45*	*197*
	% within Being Insured	*100.0%*	*100.0%*	*100.0%*
	% of Total	*77.2%*	*22.8%*	*100.0%*

Table 6.10. Household Income Level and ZDS Purchase

		Being Insured		Total
		Insured	Uninsured	
1. > 5001 YTL	Count	5	2	7
	% within insured Being Insured	3.4%	4.5%	3.7%
	% of Total	2.6%	1.0%	3.7%
2. Betw. 5001-2001 YTL	Count	12	3	15
	% within insured Being Insured	8.2%	6.8%	7.9%
	% of Total	6.3%	1.6%	7.9%
3. Betw. 2000-1000 YTL	Count	37	7	44
	% within insured Being Insured	25.2%	15.9%	23.0%
	% of Total	19.4%	3.7%	23.0%
4. Betw. 999-751 YTL	Count	43	9	52
	% within insured Being Insured	29.3%	20.5%	27.2%
	% of Total	22.5%	4.7%	27.2%
5. Betw. 750-500 YTL	Count	27	13	40
	% within insured Being Insured	18.4%	29.5%	20.9%
	% of Total	14.1%	6.8%	20.9%
6. Betw. 499-201 YTL	Count	23	8	31
	% within insured Being Insured	15.6%	18.2%	16.2%
	% of Total	12.0%	4.2%	16.2%
7. < 200 YTL	Count	0	2	2
	% within insured Being Insured	.0%	4.5%	1.0%
	% of Total	.0%	1.0%	1.0%
Total	*Count*	*147*	*44*	*191*
	% within insured Being Insured	*100.0%*	*100.0%*	*100.0%*
	% of Total	*77.0%*	*23.0%*	*100.0%*

Although un-insured Hhs seem to earn more than insured Hhs in '*wage income'* category (Table 6.11), the share of insured and un-insured Hhs with 'wage income' is found approximately same (33% and 30%, respectively). Indeed, wage income is found statistically not related with ZDS Purchase [Pearson chi-square=0.224, p= 0.636]. Besides, more un-insured Hhs are expected within '*free income*', because of having irregular income type. As expected, more un-insured Hhs are found in free income category than insured Hhs (43% and 30%, respectively), when insured Hhs seem to earn more than un-insured Hhs (Table 6.11). In spite of not related to ZDS purchase behavior significantly, free income has inverse influence [Pearson chi-square (1)= 2.645, p= 0.104; Phi= -0.115].

Moreover, more insured Hhs are expected within the 'rental income' category because of having additional revenue and investment habit in real estate. Although rental income is found not so common among both insured and un-insured Hhs, more insured Hhs seem to have rental income than un-insured Hhs (9% and 7%, respectively). In addition, insured Hhs in this income category appear to earn more than un-insured Hhs (Table 6.11). However, rental income is not related to ZDS purchase at a statistically significant level [Pearson chi-square (1)= 0.205, p= 0.651]. On the other hand, capital and interest income is expected inversely involved with ZDS purchase, because Hhs with this income type could prefer to invest in bank instead of real estate. As expected, capital and interest income type

is found as inversely related to ZDS purchase, although this relationship is statistically no significant [Pearson chi-square (1)=0.021, p= 0.884; Phi= -0.010]. In addition, insured Hhs in this income type are observed as earning more than un-insured Hhs in this income type (Table 6.11). As a result, none of the income types are found as involved with ZDS purchase significantly.

Table 6.11. Average Income in Income Types and ZDS Purchase

Income Types	*Being Insured*	Average Income	N	Std. Deviation
Wage Income	*Insured*	1467	49	1252.439
	Uninsured	1611	11	1590.454
Salary Income	*Insured*	1159	78	983.0543
	Uninsured	1251	20	1470.555
Free Income	*Insured*	1381	45	1039.202
	Uninsured	1172	16	1280.068
Rental Income	*Insured*	1500	13	945.108
	Uninsured	792	3	144.3376
Capital and Interest Income	*Insured*	2458	3	2223.22
	Uninsured	625	1	.

On the other hand, '*car ownership*', which could be another indicator of Hhs' wealth [Pearson chi-square (1)= 3.797, p= 0.051; Phi=0.140], because car ownership is found as more common among insured Hhs than un-insured Hhs (38.7% and 22.7%, respectively). In contrast, insured and un-insured Hhs possess approximately same amount of 'housing goods', when possessed housing goods does not differ in ZDS purchase at a statistically significant level [M=11.45; 10.85; and Mann-Whitney U= 3145, z= -1.509, p= 0.131, respectively]. Likewise, possessing "another house" is found approximately same among both insured and un-insured Hhs (29% and 24%; and Pearson chi-square (1)=0.328, p= 0.567, respectively). Despite, more insured Hhs are examined as possessing estates such as "commercial, depot and land" than un-insured Hhs (12.9%, 3%, 11% and 10.8%, 2.7%, 5.4%, respectively). However, none of these 'Hh wealth' attributes are found as related with ZDS purchase at a statistically significant level [Pearson chi-square (1)= 0.086; 0.019; 1.027; p= 0.770; 0.889; 0.311, respectively].

Sixth, Hh-Head's occupation is estimated as related to ZDS purchase at a statistically significant level [Pearson chi-square (5) = 11.714, p= 0.039]. Since most of the Hhs in Zeytinburnu are blue collar workers, most of theinsured and un-insured Hhs are also found as blue collar workers. Despite, their share among un-insured Hhs is found more than that among insured Hhs. Likewise, more Hhs in free and trade/artisanal occupations are found among un-insured Hhs, whereas professionals constitute a

substantial proportion of insured Hhs. That is, ZDS purchase seems to be involved with certain occupations as professional, clerical and art directly, whereas blue-collar workers, retired-house wives, free and trade-artisanal occupations seem to be not involved with ZDS purchase (Table 6.12).

Table 6.12. Hh-Head's Occupation and ZDS Purchase

Hh-Head's Occupation		Being Insured		Total
		Insured	Uninsured	
Blue Collar Workers	Count	42	17	59
	% within Being Insured	27.8%	38.6%	30.3%
	% of Total	21.5%	8.7%	30.3%
Retired/House wife	Count	38	12	50
	% within Being Insured	25.2%	27.3%	25.6%
	% of Total	19.5%	6.2%	25.6%
Professionals	Count	33	2	35
	% within Being Insured	21.9%	4.5%	17.9%
	% of Total	16.9%	1.0%	17.9%
Free	Count	19	6	25
	% within Being Insured	12.6%	13.6%	12.8%
	% of Total	9.7%	3.1%	12.8%
Trade/Artisanal	Count	7	6	13
	% within Being Insured	4.6%	13.6%	6.7%
	% of Total	3.6%	3.1%	6.7%
Clerical	Count	8	1	9
	% within Being Insured	5.3%	2.3%	4.6%
	% of Total	4.1%	.5%	4.6%
Art	Count	4	0	4
	% within Being Insured	2.6%	.0%	2.1%
	% of Total	2.1%	.0%	2.1%
Total	*Count*	*151*	*44*	*195*
	% within Being Insured	*100.0%*	*100.0%*	*100.0%*
	% of Total	*77.4%*	*22.6%*	*100.0%*

Seventh, Hh-Head's employment status is expected to be related with ZDS purchase, because working Hh-Heads could purchase ZDS due to having regular income. However, most of the working Hh-Heads are found among un-insured Hhs, whereas most of insured Hh-Heads are observed as retired and house-wife. Likewise, many retired and housewife spouses are found among insured Hhs. In contrast, less Hh-Heads are examined within these employment statuses among un-insureds. In addition, most of working spouses are found among un-insured Hhs (Table 6.13). However, there is found statistically no significant relationship for employment status of both Hh-Heads and spouses [Pearson chi-squares (3 and 3)= 1.211 and 1.704, p= 0.750 and 0.427, respectively].

Finally, dependency ratio of insured Hhs is estimated higher than that of un-insured Hhs (2.40 and 1.90, respectively). That is, employment status seems to be inversely involved with ZDS purchase, whereas it may be directly involved with being retired and house-wife. On the other hand, average

income amount of retired and un-employed Hhs is found more among insured Hhs, whereas average income of working insured Hhs is found higher than that of working un-insured Hhs. (Table 6.14).

Table 6.13. Hh Head's Employment Status and ZDS Purchase

Hh-Head's Employment Status		Being Insured		Total
		Insured	Uninsured	
Retired	Count	50	13	63
	% within Being Insured	32.9%	30.2%	32.3%
	% of Total	25.6%	6.7%	32.3%
Unemployed	Count	3	0	3
	% within Being Insured	2.0%	.0%	1.5%
	% of Total	1.5%	.0%	1.5%
House-wife	Count	9	2	11
	% within Being Insured	5.9%	4.7%	5.6%
	% of Total	4.6%	1.0%	5.6%
Working	Count	90	28	118
	% within Being Insured	59.2%	65.1%	60.5%
	% of Total	46.2%	14.4%	60.5%
Total	*Count*	*152*	*43*	*195*
	% within Being Insured	*100.0%*	*100.0%*	*100.0%*
	% of Total	*77.9%*	*22.1%*	*100.0%*

Table 6.14. Employment Status, Income Level and ZDS Purchase

Being Insured	Hh Head Employment Status	Average Income	N	Std. Deviation
Insured	Retired	892.9348	46	404.20234
	Unemployed	533.3333	3	158.77132
	House-wife	693.7500	8	392.73537
	Working	1525.9036	83	1263.50899
Uninsured	Retired	1395.4545	11	1797.66578
	House-wife	750.0000	2	176.77670
	Working	938.5417	24	867.84275

With respect to satisfaction with expenditures, insured Hhs are expected to spend more for their security needs in contrast to un-insured Hhs. As expected, insured Hhs are observed as more satisfied with expenditures such as 'education, housing, furniture, insurance, clothing and entertainment'. In contrast, higher satisfaction of un-insured Hhs is found for expenditures such as 'food, health and transportation'. These differences can indicate that un-insured Hhs afford only to their daily needs, whereas insured Hhs afford also to their security and entertainment needs (Table 6.15).

Indeed, 'satisfaction with insurance expenditure' and 'satisfaction with house expenditure' are estimated as involved with ZDS purchase at statistically significant levels [Pearson chi-squares (4 and 3)= 11.439 and 11.308; p= 0.022 and 0.010; Cramers' V= 0.267 and 0.278, respectively]. Although insured Hhs are more satisfied with their housing and general insurance expenditure, their satisfaction is also below middle point of this scale. In addition, average annual house maintenance expenditure of insured Hhs is expected more than that of un-insured Hhs. As expected, insured Hhs spend more than un-insured Hhs and than the average in the sample (M=810; 560; and 748 YTL, respectively). Indeed, many insured Hhs spend for house maintenance more than un-insured Hhs. Despite, ZDS purchase do not differ according to annual house maintenance expenditure of Hhs [Mann-Whitney U= 1568, z= -1.380, p= 0.168].

As a result, Hhs' socio-demographic and economic attributes that are involved with ZDS purchase at a statistically significant level are found as:

- Hh-Head's education,
- Hh income level,
- Hh-Head's occupation,
- Satisfaction with insurance expenditure, and
- Satisfaction with housing expenditures.

Hh-Heads that have higher education level earn also more than other Hhs among insured Hhs, when this relationship statistically significant. In addition, insured Hhs in higher education level are more satisfied with their insurance expenditure at a significant level. In contrast, education level and satisfaction with insurance are inversely related with each other among un-insured Hhs, although this is statistically not significant. In addition, insured Hhs are more satisfied with both housing and insurance expenditure in contrast to un-insured Hhs, when satisfactions with housing and insurance expenditure are related with each other significantly among insured Hhs. On the other hand, income level of Hhs does not influence satisfaction with insurance and housing expenditures among both insured and un-insured Hhs. Despite, these findings indicate that Hhs, who purchase ZDS have not only higher income and education, but they could also purchase other insurances in their life and they spend more for housing expenditures (Table 6.16).

Table 6.15. Satisfaction with Expenditures and ZDS Purchase

Expenditures	Insured Hhs			Un-insured Hhs			Total		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Food	149	2.946	.655	44	3.000	.889	193	2.958	.713
Education	116	2.836	.968	38	2.763	1.217	154	2.818	1.031
Housing	107	2.476	.816	39	2.179	1.072	146	2.397	.898
Furniture	122	2.393	.818	42	2.333	.754	164	2.378	.800
Insurance	123	2.414	.913	38	1.842	.855	161	2.279	.930
Clothing	136	2.691	.873	43	2.627	.756	179	2.676	.845
Health	136	2.860	.870	43	3.023	.771	179	2.899	.848
Entertainment	127	1.952	.907	42	1.714	.834	169	1.893	.893
Transport	118	2.694	.862	40	2.750	1.056	158	2.708	.912
Valid N (listwise)	81			35			116		

Some of the socio-economic attributes of Hhs in the some occupation differ in ZDS purchase behavior. Insured blue collar workers and retired-house wives have higher education levels but lower income levels than un-insured blue collar Hhs. Insured blue collar workers are also more satisfied with their housing and insurance expenditures. In contrast, insured professionals have lower education and income level than un-insured professionals, although they are more satisfied with their housing and insurance expenditures. Insured Hhs in trade-artisanal occupations have lower education level but higher income level than un-insured Hhs in same occupation. Finally, insured Hhs in free occupations and clericals have higher education level but lower income level (Table 6.17).

Table 6.16. Correlations between Significant Attributes of Hhs

Spearman's rho Correlation Coefficient	ZDS Purchase	Education of Hh-Heads by Years	Income Amount (Av. of Income Levels)	Satisfaction with Housing Expenditure	Satisfaction with Insurance Expenditure
Education of Hh-Heads by Years	Insured	1.000			
	Uninsured	1.000			
Income Amount (Av. of Income Levels)	Insured	.363(**)	1.000		
	Uninsured	.209	1.000		
Satisfaction with Housing Expenditure	Insured	.043	.133	1.000	
	Uninsured	.181	.091	1.000	
Satisfaction with Insurance Expenditure	Insured	.281(**)	.139	.387(**)	1.000
	Uninsured	-.210	.215	.193	1.000

** Correlation is significant at the 0.01 level (2-tailed). Insured :Listwise N = 93; Uninsured :Listwise N = 30

Table 6.17. Socio-Economic Predictors of ZDS Purchase and Hh-Head's Occupation

ZDS Purchase	Hh's Occupation	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)	Satisfaction with Housing Expenditure	Satisfaction with Insurance Expenditure
Insured	Blue Collar Workers	6.7000	828.9474	2.5357	2.3636
	Retired/House wife	5.9722	869.4444	2.3333	1.9600
	Professionals	13.0000	2000.0000	2.6667	3.0667
	Free	8.7895	1416.1765	2.5455	2.3333
	Trade/Artisanal	6.0000	2104.1667	2.6667	2.0000
	Clerical	10.6250	928.5714	2.2500	2.6667
Uninsured	Blue Collar Workers	6.4118	1117.3077	1.7857	2.0000
	Retired/House wife	5.5000	1020.4545	2.2500	2.0000
	Professionals	15.0000	2937.5000	3.5000	1.0000
	Free	5.0000	525.0000	2.3333	1.8000
	Trade/Artisanal	9.5000	895.8333	2.6667	1.5000
	Clerical	13.0000	625.0000	1.0000	1.0000

As a result, socio-economic attributes of Hhs that infuence ZDS purchase behavior seem to their income level, education level and satisfaction with insurance and housing expenditures. However, Hh-Head's occupation appears to influence these attributes. In addition Hh income level is directly related to education levels of Hhs, which is related to satisfaction with insurance expenditure that seem to be associated with satisfaction with housing expenditure. In other words, Hhs with higher income and education level appear to purchase more insurance in their daily life, when they also invest in their houses more than others.

6.1.2.2. Socio-Cultural Attributes of Households

First, insured Hhs are expected to have more hierarchical world-views. In fact, items on **hierarchical world-view scale** are evaluated by all Hhs with higher scores than other world-view scales. That is, Hhs in the sample seem to have hierarchical world-views, in general. As expected, scores of insured Hhs are found higher than that of un-insured Hhs (Table 6.18). Although insured Hhs seem to have more hierarchical world-views, ZDS purchase is not involved with this world-view at a statistically significant level [Pearson chi-square (10) = 11.439, p= 0.324]. Second, insured Hhs are also expected to be more individualistic because of their ZDS purchase behavior in voluntary purchase conditions. As expected, items **on individualistic world-view scale** are evaluated with higher scores by insured Hhs (Table 6.19). Despite, this world-view is not related with ZDS purchase significantly [Pearson chi-square (15) = 12.279, p= 0.658].

Table 6.18. Hierarchical World-Views According to ZDS Purchase

Hierarchical World-views	All Hhs			Insured Hhs			Uninsured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Young people should be more disciplined nowadays.	159	4.4403	.74282	122	4.4754	.68289	37	4.3243	.91451
Military Service is very necessary.	156	4.3654	.90935	119	4.3697	.88169	37	4.3514	1.00599
I do not prefer to meet the people who cannot separate the truths and wrongs.	156	4.0256	1.12994	119	4.0504	1.10353	37	3.9459	1.22352
To continue family traditions is important.	158	4.3671	.73454	121	4.4215	.69224	37	4.1892	.84452
Average Score	152	4.2829	.66964	115	4.3087	.62770	37	4.2027	.79021

Table 6.19. Individualistic World-views and ZDS Purchase

Individualistic World-views	All Hhs			Insured Hhs			Uninsured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
In a fair system people with more ability should earn more	144	4.3958	.63926	111	4.4324	.62699	33	4.2727	.67420
If a person has the get-up- and to acquire wealth, that person should have the right to enjoy it.	155	3.5677	1.22750	119	3.6134	1.20105	36	3.4167	1.31747
Saving money is the main reason for hard work.	153	3.7451	1.12700	117	3.7778	1.10727	36	3.6389	1.19888
The state should less intervene to economy.	151	3.1391	1.27562	116	3.1983	1.29360	35	2.9429	1.21129
Average Score	136	3.7831	.73712	104	3.8077	.73259	32	3.7031	.75786

Table 6.20. Egalitarian World-views and ZDS Purchase

Egalitarian World-views	All Hhs			Insured Hhs			Uninsured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
If people in this country were treated more equally we would have fewer problems.	147	4.4422	.60962	114	4.4561	.59705	33	4.3939	.65857
The state should make sure everyone has a good standard of living.	150	4.5267	.58730	117	4.5726	.53039	33	4.3636	.74239
I would support a tax change- additional taxes that support people with less fortunate.	141	3.6454	1.05651	112	3.6161	1.09253	29	3.7586	.91242
The world could be a more peaceful place if its wealth was shared among nations more equally.	145	4.3931	.66975	114	4.4561	.62599	31	4.1613	.77875
Average Score	123	4.2602	.52635	98	4.2908	.52230	25	4.1400	.53561

Third, insured Hhs could have more egalitarian world-view, because they can purchase ZDS depending on perceived social solidarity attribute of ZDS. Indeed, items on egalitarian world-view scale are scored by insured Hhs higher (Table 6.20). Particularly one item on this scale is related to ZDS purchase behavior at a statistically significant level: 'World could be a more peaceful place, if its wealth was shared among nations more equally' [Pearson chi-square (4) = 11.354, p= 0.023]. Despite, ZDS purchase behavior is not related to egalitarian world-view in average [Pearson chi-square (14) = 17.419, p= 0.235].

Next, un-insured Hhs are expected to have more fatalistic world-view. As expected, main difference between insured and un-insured Hhs is observed in their evaluation of fatalistic world-view scale (Table 6.21). Despite, there is found no significant relationship between fatalistic world-view and ZDS purchase behavior [Pearson chi-square (13) = 13.209, p= 0.402]. Likewise, insured Hhs have scored the item involved with perceived controllability in their life' higher than un-insured Hhs, although this score does not differ at a significant level [Mann-Whiney U= 1700.5, z= -1.296, p= 0.195].

On the other hand, items of sense of belonging scale and social influence indicate significant differences in ZDS purchase behavior (Table 6.22). Particularly, 'participating into events related to problems of neighbourhood' and 'having a social environment, where earthquake threat and preparedness is spoken' are found as related ZDS purchase behavior significantly [Pearson chi-square (4) = 10.481, p= 0.033; and Pearson chi-square (4) = 11.500, p= 0.021, respectively]. As a result, hierarchical, individualistic, egalitarian world-views and participation into events and social influence seem to influence ZDS purchase directly.

Table 6.21. Fatalistic World-views and ZDS Purchase

	All Hhs			Insured Hhs			Uninsured Hhs		
Fatalistic World-views	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
There is no use in doing things for people - you only get it in the neck in the long run.	130	2.5615	.84453	101	2.5248	.83179	29	2.6897	.89056
Cooperating with others rarely works.	149	2.8792	1.14439	114	2.8421	1.13339	35	3.0000	1.18818
The future is too uncertain for a person to make serious plan.	148	3.3108	1.11789	114	3.2632	1.10552	34	3.4706	1.16086
I feel that life is like a lottery.	150	3.3333	1.33947	116	3.3362	1.31839	34	3.3235	1.42957
Average Score	126	2.9325	.76250	99	2.9192	.74985	27	2.9815	.82020

Table 6.22. Perceived Controllability, Sense of Belonging, Social Influence and ZDS Purchase

	All Hhs			Insured Hhs			Uninsured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Perceived controllability									
I have control on events happening in my life.	148	3.5270	1.13955	112	3.6429	112	30	3.6000	1.13259
Sense of belonging									
I feel myself as belong to the building, environment and neighbourhood, where I live.	142	3.6338	1.03471	103	4.1845	.75078	30	4.2000	.76112
I participate to events related with problems of my neighbourhood.	133	4.1880	.75026	111	4.1802	.81126	33	3.8182	1.10268
Social influence									
In daily life, earthquake threat and preparedness against earthquakes is spoken in my social environment.	153	3.6340	1.13411	117	3.7607	1.03931	36	3.2222	1.33333
Average Score	116	3.9504	.60543	91	3.9615	.59386	25	3.9100	.65701

Table 6.23. Correlations between Socio-Cultural Attributes of Households

Spearman's rho Correlation Coefficients	ZDS Purchase	1	2	3	4	5	6	7
(1) Hierarchical World-view	Insured	1.000						
	Uninsured	1.000						
(2) Individualistic World-view	Insured	.547(**)	1.000					
	Uninsured	.549(**)	1.000					
(3) Fatalistic World-view	Insured	.362(**)	.304(**)	1.000				
	Uninsured	.272	.234	1.000				
(4) Egalitarian World-view	Insured	.519(**)	.370(**)	.238(*)	1.000			
	Uninsured	.224	.189	.220	1.000			
(5) Sense of Belonging	Insured	.330(**)	.310(**)	.317(**)	.496(**)	1.000		
	Uninsured	.218	.352	.198	.122	1.000		
(6) Perceived Controllability	Insured	.145	.211(*)	.028	.291(**)	.294(**)	1.000	
	Uninsured	.249	.261	.160	.364	.344	1.000	
(7) Social Influence	Insured	.206(*)	.236(*)	.185	.238(*)	.366(**)	.112	1.000
	Uninsured	.019	.187	.125	.080	.427(*)	.388	1.000

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 99 and Uninsured :Listwise N = 25

Hiearchical and individualistic world-views are found as related to each other among both insured and un-insured Hhs significantly. However, fatalistic world-view is estimated as related to hierarchical and individualistic world-views only among insured Hhs. Likewise, egalitarian world-view and sense of belonging are also found as related to each other and to hierarchical, individualistic and fatalistic world-views only among insured Hhs. In addition, perceived controllability is involved with individualistic world-view, egalitarian world-view and sense of belonging among insured Hhs. 'Social influence', which is related to ZDS purchase significantly, is found as not related to fatalistic world-view and perceived controllability among insured Hhs. Instead, it is related to hierarchical, individualistic and egalitarian world-views, but particularly to sense of belonging. On the other hand, social influence is also related to sense of belonging among un-insured Hhs significantly. This can

indicate that the relationship between sense of belonging and social influence has no influence on ZDS purchase. However, egalitarian world-view and sense of belonging seem to influence ZDS purchase together (Table 6.23).

Socio-economic Attributes of Households

Although sense of belonging and education level were found as involved with ZDS purchase, they are inversely related among both insured and un-insured Hhs, when this relationship is significant among un-insured Hhs. That is, un-insured Hhs with higher education level seem to feel themselves not belong to their neighborhood. Though not significant, education level is found inversely related with almost each socio-cultural attribute, particularly among un-insured Hhs. Socio-cultural attributes that are directly involved with education level among insured Hhs are observed as individualistic and egalitarian world-views and perceived controllability in life, although these are found statistically not significant (Table 6.24).

Table 6.24. Socio- Economic and Socio-Cultural Attributes of Households

Spearman's rho Correlation Coefficient	ZDS Purchase	Hh-Head's Age	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)	Satisfaction with Housing Expenditure	Satisfaction with Insurance Expenditure
Hierarchical World-view	Insured	.041	-.136	-.288(*)	-.082	-.095
	Uninsured	.371	-.039	.023	-.220	.246
Individualistic World-view	Insured	-.079	.002	.089	-.025	.053
	Uninsured	-.186	-.189	-.272	-.335	.059
Fatalistic World-view	Insured	-.158	-.183	-.121	.058	-.186
	Uninsured	.178	-.423	.159	-.495(*)	.082
Egalitarian World-view	Insured	-.043	.019	-.058	.102	.158
	Uninsured	.140	-.060	-.097	-.544(*)	.190
Sense of Belonging	Insured	.064	-.133	-.111	-.019	-.082
	Uninsured	.080	-.532(*)	.086	-.365	.306
Perceived Controllability in Life	Insured	.005	.046	.150	.082	.060
	Uninsured	.395	-.071	.016	-.274	.107
Social Influence	Insured	-.102	-.036	.084	.056	.104
	Uninsured	-.160	-.120	-.144	-.102	-.210

* Correlation is significant at the 0.05 level (2-tailed).Insured :Listwise N = 61 and Uninsured :Listwise N = 17

Although income level and hierarchical world-views were found as involved with ZDS purchase, their inverse relationship between insured and un-insured Hhs can indicate that Hhs in lower income levels can purchase ZDS because of their hierarchical world-views. Though not significant, direct relationship between income amount and individualistic world-view can also indicate that higher income level Hhs purchase ZDS with the influence of their individualistic world-view. On the other hand, fatalistic world-view is found as inversely related to satisfaction with housing expenditure among

un-insured Hhs. In other words, un-insured Hhs that have lower satisfaction with housing expenditure seem to have more fatalistic and egalitarian world-views, when this relationship is statistically significant (Table 6.24).

6.1.2.3. House and Building Attributes

Since the insured and un-insured Hhs in the sample are selected from the same building, comparison of houses according to ZDS purchase may not differ in this study. Despite, certain differences are observed for house and building attributes according to ZDS purchase. With respect to house-size, houses of insured Hhs are found larger, when this difference is not significant [Mann-Whitney U=28.37.5, z= -0.205, p= 0.837]. Houses of insured Hhs seem to also have more rooms though not significant [Mann-Whitney U= 2985, z= -0.747, p= 0.455]. In addition, more 'apartment units' are observed in the buildings of insured Hhs, although this difference is not significant [Mann-Whitney U= 3115.5, z= -0.632, p= 0.528].

Table 6.25. House – Building Attributes and ZDS Purchase

Variables	All Hhs			Insured Hhs			Un-insured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
House Size	180	92.727	26.652	138	93.594	28.655	42	89.881	18.622
Number of Rooms	191	3.141	.653	148	3.162	.700	43	3.069	.457
Floors in Building	194	5.355	2.658	151	5.317	2.676	43	5.488	2.622
Dwelling Units in Building	195	13.184	14.779	151	13.284	15.566	44	12.840	11.832
Age of Building	190	14.394	5.817	148	14.689	6.070	42	13.357	4.741
Commercial and Official Units in Building	99	2.010	1.257	80	1.862	1.209	19	2.631	1.300
Buying-Selling Value	151	85960	39309	118	88008	41008	33	78636	31997
Rental Value	163	515	187	125	531	202	38	460	114
Duration of Residence in Housing (month)	204	131	71	158	135	71	46	116	70
Expected Residence Duration in Housing (month)	36	136	116	27	120	113	9	185	115
Valid N (listwise)	18			16			2		

In addition, more 'commercial and official units' are found in the buildings of un-insured Hhs, when this difference is found statistically significant [Mann-Whitney U= 468, z= -2.764, p= 0.006]. On the other hand, insured houses seem to have higher 'buying-selling value' and 'rental value' than un-insured (Table 6.25). Despite, these differences are found statistically not significant [Mann-Whitney U=1717.5, z= -1.037, p= 0.300 and Mann-Whitney U= 1986, z= -1.545, p= 0.122, respectively].

'Structural system' of almost all houses is found as reinforced concrete buildings (94.9%), when only 9.6% of Hhs claimed that they have 'car park'. With respect to 'building age', most of buildings are constructed during last 10-19 years (1984-1994), which are followed by buildings constructed in last 9 years. Buildings that were constructed between 1974 and 1983 are observed low in the sample. On the other hand, insured houses seem to be constructed earlier than un-insured houses. Similarly, higher rate of un-insured buildings is observed for buildings constructed between 1984 and 1994. However, most of insured houses are also found as constructed between these years (Table 6.26).

Table 6.26. Building Age Groups and ZDS Purchase

Building Age Groups		Being Insured		Total
		Insured	Uninsured	
0-9 (2005-1994)	Count	24	6	30
	% within Being Insured	16.2%	14.3%	15.8%
	% of Total	12.6%	3.2%	15.8%
10-19 (1995-1986)	Count	100	32	132
	% within Being Insured	67.6%	76.2%	69.5%
	% of Total	52.6%	16.8%	69.5%
20-29 (1985-1976)	Count	18	3	21
	% within Being Insured	12.2%	7.1%	11.1%
	% of Total	9.5%	1.6%	11.1%
30-39 (1975-1966)	Count	6	1	7
	% within Being Insured	4.1%	2.4%	3.7%
	% of Total	3.2%	.5%	3.7%
Total	*Count*	*148*	*42*	*190*
	% within Being Insured	*100.0%*	*100.0%*	*100.0%*
	% of Total	*77.9%*	*22.1%*	*100.0%*

On the other hand, most of Hhs claimed that they bought their houses, when some of them told they owned their house through 'inheritance' and 'self-developed'. Most of insured Hhs have declared their way of ownership as 'inheritance', whereas most of un-insured Hhs declared their way of ownership as 'self-developed' (Table 6.27). Besides, average 'duration in residence' is found as 204 months in the sample, when 'expected duration' is observed as 36 months in average. Almost all Hhs answered 'no' to the question about their 'moving plan in the future'. However, average duration of insured Hhs is found higher than that of un-insured Hhs. In contrast, un-insured Hhs are observed as having longer expected duration (Table 6.25). Besides, rate of 'yes' answer for moving plan question is observed higher for insured Hhs (8.2%) than un-insured Hhs (4.3%).

Table 6.27. Way of Ownership and ZDS Purchase

Way of Ownership		Being Insured		Total
		Insured	Uninsured	
Bought	Count	100	28	128
	% within Being Insured	66.7%	66.7%	66.7%
	% of Total	52.1%	14.6%	66.7%
Inheritance	Count	27	7	34
	% within Being Insured	18.0%	16.7%	17.7%
	% of Total	14.1%	3.6%	17.7%
Self-Developed	Count	12	7	19
	% within Being Insured	8.0%	16.7%	9.9%
	% of Total	6.3%	3.6%	9.9%
Another	Count	11	0	11
	% within Being Insured	7.3%	.0%	5.7%
	% of Total	5.7%	.0%	5.7%
Total	*Count*	*150*	*42*	*192*
	% within Being Insured	*100.0%*	*100.0%*	*100.0%*
	% of Total	*78.1%*	*21.9%*	*100.0%*

As a result, only 'number of commercial and official units in the building' seems to differ among insured and un-insured Hhs at a statistically significant level. 'Number of commercial and official units in the building' is found as directly related to 'number of dwelling units in the building' among both insured and un-insured Hhs' houses. However, age of the buildings is inversely related to the number of dwelling units among insured Hhs, which is directly related to number of floors. This can indicate that older buildings among insured Hhs seem to have less number of commercial and official units in the buildings, when these buildings have less number of floors (Table 6.28).

Table 6.28. House-Building Attributes According to ZDS Purchase

	Being Insured	1	2	3	4	5	6	7
1) House Size	Insured	1.000						
	Uninsured	1.000						
2) Number of Floors at the Building	Insured	-.013	1.000					
	Uninsured	.360	1.000					
3) Number of Dwelling Units at the Building	Insured	.047	.272(*)	1.000				
	Uninsured	-.077	.291	1.000				
4) Age of the Building	Insured	-.160	-.083	-.267(*)	1.000			
	Uninsured	-.492	-.140	.463	1.000			
5) Number of Commercial and Official Units at the Building	Insured	.027	.099	.493(**)	-.076	1.000		
	Uninsured	.161	.261	.746(**)	.377	1.000		
6) Buying-Selling Value of Dwelling Unit in the Market	Insured	.637(**)	-.135	.018	-.069	.097	1.000	
	Uninsured	.371	-.012	-.453	.002	.033	1.000	
7) Rental Value of Dwelling Unit	Insured	.466(**)	-.114	-.012	.034	-.003	.718(**)	1.000
	Uninsured	.640(*)	.581(*)	-.167	-.251	.041	.356	1.000

Spearman's rho - Correlation Coefficient. ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 58 and Uninsured :Listwise N = 14

According to the comparison of house-building attributes with socio-economic attributes of Hhs, insured Hhs in higher education levels seem to have larger houses. On the other hand, un-insured Hhs in higher income levels appear to have larger houses with less dwelling units at the building. However, houses of insured Hhs in higher education and income level seem to have more rental value, when they also expend more to house maintenance expenditures. Indeed, satisfaction with housing expenditure seem to be related with the number of commercial and official units in the buildings among insured Hhs (Table 6.29).

Table 6.29. House-Building Attributes and Socio-Economic Household Attribues

Spearman's rho Correlation Coefficient	Being Insured	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)	Satisfaction with Housing Expenditure	Satisfaction with Insurance Expenditure	Housing Maintenance Expenditure (annual/YTL)
House Size	Insured	.407(*)	.291	-.010	.030	.253
	Uninsured	.399	.890(**)	.019	.080	.187
Number of Dwelling Units at the Building	Insured	.124	.147	.379(*)	.038	.200
	Uninsured	-.160	-.771(*)	-.039	.000	.150
Number of Commercial and Official Units at the Building	Insured	.098	-.003	.359(*)	-.122	.163
	Uninsured	.174	-.271	.617	-.262	-.654
The Rental Value of Dwelling Unit	Insured	.438(*)	.374(*)	.178	.144	.496(**)
	Uninsured	-.160	.587	-.156	.479	.037

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 32 and Uninsured :Listwise N = 7

Insured Hhs that have more individualistic and fatalistic world-view seem to have houses with less number of commercial and official units. These Hhs appear to feel themselves less belong to their neighborhood and less influenced by their social environment. In addition, un-insured Hhs that feel themselves not belong to their neighborhood seem to have houses with more number of commercial and official units and dwelling units at the buildings. In contrast, insured Hhs that are influenced by their social environment may have houses at older buildings (Table 6.30).

Table 6.30. House-Building Attributes and Socio-Cultural Household Attribues

Spearman's rho Correlation Coefficient	Being Insured	Individualistic World-view	Fatalistic World-view	Sense of Belonging	Social Influence
Number of Dwelling Units at the Building	Insured	-.199	-.050	-.294	.152
	Uninsured	-.314	-.289	-.704(*)	-.407
Age of the Building	Insured	-.056	-.036	-.058	-.362(*)
	Uninsured	-.163	-.183	.177	.157
Number of Commercial and Official Units at the Building	Insured	-.416(**)	-.421(**)	-.416(**)	-.144
	Uninsured	-.317	-.326	-.724(*)	-.361

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 38 and Uninsured :Listwise N = 10

6.1.2.4. Earthquake Risk Perception of Households

Beginning with "*perception of earthquake as a threat to society*", Hhs evaluated 'earthquakes' as less important than other risks such as street theft, cancer, traffic accidents, bird flu, fraud, terror and GSM stations. In fact, "earthquake threat" has seventh priority for Hhs, when only 7.6% of them thought that earthquake is an essential threat to people living in Istanbul. Un-insured Hhs seem to perceive 'earthquake risk to society' more than insured Hhs (Table 6.31).

Table 6.31. Perceived Risks to Istanbul

Threats	All Hhs			Insured Hhs			Uninsured Hhs		
	N	%	Valid %	N	%	Valid %	N	%	Valid %
Street Theft	145	64.7	76.7	102	62.2	75.6	30	69.8	78.9
Cancer	117	52.2	61.9	93	56.7	68.9	17	39.5	44.7
Traffic Accidents	100	44.6	52.9	69	42.1	51.1	19	44.2	50.0
Bird Flu	72	32.1	38.1	51	31.1	37.8	14	32.6	36.8
Fraud	55	24.6	29.1	39	23.8	28.9	12	27.9	31.6
Terror	40	17.9	21.2	27	16.5	20.0	11	25.6	28.9
GSM Stations	25	11.2	13.2	19	11.6	14.1	4	9.3	10.5
Earthquake	17	7.6	9.0	10	6.1	7.4	6	14.0	15.8

In contrast, "earthquake probability" is treated by Hhs as the second highest threat they can experience. Although they scored 'probability to experience street theft' higher than earthquake, street theft is a daily risk that can be confronted more often. However, Hhs expect more losses from 'earthquakes' than they expect from other threats. As a result, 'general perceived earthquake risk' is found as the highest perceived risk among other fifteen risks for all Hhs. In addition, un-insured Hhs perceive 'earthquake probability' more than insured Hhs, while insured Hhs perceive 'losses from earthquakes' more than un-insured Hhs. Likewise, insured Hhs perceive 'earthquake risk' more than un-insured Hhs (Table 6.32). However, these differences in 'perceived probability', 'perceived losses' as well as 'perceived risk' are found statistically not significant for ZDS purchase behavior [Mann-Whitney U= 2160.5, z= -1.429, p= 0.153; Mann-Whitney U=1876.5, z= -1.126, p= 0.260 and Mann-Whitney U=2328, z= -0.123, p= 0.902, respectively].

Table 6. 32. Perceived Probability, Losses and Risk (General)

Threats	All Hhs			Insured Hhs			Un-insured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Perceived Probability of Threats									
PP of Earthquake	167	3.1317	.48534	131	3.1145	.49054	36	3.1944	.46718
Traffic Accidents	165	3.0909	.58245	129	3.1008	.55685	36	3.0556	.67377
Street Theft	165	3.1455	.54386	129	3.1240	.53044	36	3.2222	.59094
Cancer	157	3.0000	.43853	122	2.9754	.47173	35	3.0857	.28403
Burglary	164	3.1098	.45688	129	3.0853	.43357	35	3.2000	.53137
Perceived Loss from Threats									
Earthquake	154	3.7078	.98965	118	3.7458	1.01431	36	3.5833	.90633
Traffic Accidents	207	2.4831	1.70904	161	2.4410	1.75301	46	2.6304	1.55433
Street Theft	207	2.3671	1.57359	161	2.3106	1.57415	46	2.5652	1.57271
Cancer	207	2.6763	1.87642	161	2.6584	1.92063	46	2.7391	1.73121
Burglary	207	2.3913	1.66533	161	2.3292	1.69476	46	2.6087	1.55604
Total Risk Perception									
Earthquake	167	3.2515	.69394	131	3.4316	.48203	36	3.3357	.46291
Traffic Accidents	145	2.0966	.47616	110	2.1364	.45890	35	1.9714	.51368
Street Theft	150	2.0133	.46323	115	2.0174	.45850	35	2.0000	.48507
Cancer	141	2.2128	.51836	108	2.2222	.53535	33	2.1818	.46466
Burglary	147	2.0612	.51318	113	2.0619	.52241	34	2.0588	.48873

Perceived Immediacy of an Earthquake: First, Hhs expect occurrance of an earthquake more immediate, because higher scores are found for 'expecting an earthquake in '10 years' than 'experiencing an earthquake in life'. On the other hand, insured Hhs seem to expect 'an earthquake in their life' more than un-insured Hhs (Table 6.33). That is, insured Hhs are probably to perceive 'occurrance of an earthquake' more immediate. Despite, there is found statistically no significant difference between 'expecting an earthquake in '10 years' and 'experiencing an earthquake in life' and ZDS purchase [Mann-Whitney U= 2067, z= -0.323, p= 0.746 and Mann-Whitney U= 1999, z= -0.361, p= 0.768, respectively].

Expected Damage to Istanbul and Zeytinburnu: All Hhs expect more damage to Zeytinburnu than Istanbul. In the same way, they expect more damage and loss of life in building and than their expected damage to Zeytinburnu. Despite, Hhs perceive their building safer than other usages in the district such as 'school', 'working place', 'nearest hospital', and 'nearest hazardous storage place'. In addition, they also 'perceive building ground' safer than their building. Similarly, both insured Hhs and un-insured Hhs expect more damage to Zeytinburnu than they expect to Istanbul. However, insured Hhs expect more damage to Istanbul and Zeytinburnu than un-insured Hhs (Table 6.33). Despite, there is found statistically no significant difference between these perceptions and ZDS purchase [Mann-Whitney U=1955.5, z= -1.135, p= 0.256 and Mann-Whitney U=1877, z= -1.230, p= 0.219, respectively].

Perceived Safety of Usages in District: Highest score for perceived un-safety in the district is found for 'nearest hazardous material production and storing places' among both insured and un-insured Hhs. On one hand, insured Hhs perceive nearest hospital unsafer than school and working place. On the other hand, un-insured Hhs perceive school un-safer than their working places. This difference can be involved with working within Zeytinburnu and in another district. However, Hhs are not asked whether their working place and children's school are in Zeytinburnu or not. Despite, un-insured Hhs perceive these different but essential usages in district safer than insured Hhs. That is, 'perceived risk to nearest usages in district' of insured Hhs is higher than that of un-insured Hhs. In comparison with perceived damage to Istanbul and Zeytinburnu, however, both insured and un-insured Hhs perceive lower risk to usages in district (Table 6.33).

Table 6.33. Perceived Immediacy of and Expected Damages from an Earthquake

	All Hhs			Insured Hhs			Un-insured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Perceived Immediacy of an Earthquake									
An Earthquake in Life	162	3.2346	1.09512	130	3.2231	1.12247	32	3.2813	.99139
An Earthquake in 10 years	160	3.5750	1.12462	126	3.5873	1.12620	34	3.5294	1.13445
Perceived Damages to Istanbul, Zeytinburnu and Building's Un-Safety									
Great Damage in Istanbul	165	3.5879	1.17384	131	3.6489	1.11579	34	3.3529	1.36809
Great Damage in Zeytinburnu	161	3.9255	.95232	127	3.9764	.91256	34	3.7353	1.08177
Great Damage in the Building	207	3.2174	1.87629	161	3.3106	1.86157	46	2.8913	1.91170
Great Loss of Life in the Building	207	3.4734	1.92026	161	3.5776	1.89618	46	3.1087	1.98022
Ground of building is safe.	160	3.4312	1.06766	128	3.4219	1.10553	32	3.4688	.91526
House-Building	165	3.3394	.92721	132	3.3485	.94089	33	3.3030	.88335
Perceived Un-safety of Usages in the District									
Work-Building	112	3.5268	.94878	89	3.4831	1.00128	23	3.6957	.70290
School	108	3.5463	.97044	85	3.6000	.95369	23	3.3478	1.02730
Nearest hospital	129	3.8372	.81768	104	3.8846	.77969	25	3.6400	.95219
Nearest hazardous materials production or storing places	101	4.3366	.77817	79	4.4177	.70905	22	4.0455	.95005

Perceived Damage and Safety of Building: Both insured and un-insured Hhs expect less damage to their building than their expected damage to Istanbul and Zeytinburnu. Despite, insured Hhs perceive more damage in the building than un-insured Hhs. On the other hand, both insured and un-insured Hhs perceive their building safer than other usages in district, while insured Hhs perceive their building un-safer than un-insured Hhs. However, both insured and un-insured Hhs perceive 'building ground' safer than their building. In addition, un-insured Hhs perceive 'building ground' safer than insured Hhs (Table 6.33). These estimations may indicate that both insured and un-insured Hhs expect lower 'damage to building' than they expect to Istanbul and Zeytinburnu. In addition, they perceive their

building safer than other usages in district, when they also perceive the 'building ground' safer than 'building'. However, insured Hhs perceive 'building ground' and 'building' un-safer than un-insured Hhs. Despite, perceived safety of the building and building ground do not differ in ZDS purchase behavior of Hhs at statistically significant levels [Mann-Whitney U=2072, z= -0.462, p= 0.644 and Mann-Whitney U= 1999, z= -0.218, p= 0.827].

Table 6.34. Expected Losses at the Individual Level and ZDS Purchase

	All Hhs			Insured Hhs			Un-insured Hhs			Difference between Insureds and Un-insureds
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	
Earthquakes threat me and my relatives greatly	156	4.1667	.85635	121	4.1983	.85264	35	4.0571	.87255	Mann-Whitney U=1890.5, z=-1.047, p=0.295
I can loss my life during an earthquake	154	4.1039	.88686	120	4.1333	.88814	34	4.0000	.88763	Mann-Whitney U=1853, z=-0.876, p=0.381
I can loss my wealth in great amount during an earthquake	149	3.9597	.97176	117	3.9915	.92378	32	3.8437	1.13903	Mann-Whitney U=1793.5, z=-0.388, p=0.698
Monerary loss prediction for house (YTL)	69	72644	51756	52	81788	51849	17	44676	41383	Mann-Whitney U=236.5, z=-2.572, p=0.010
Monetary loss prediction for housing goods (YTL)	75	18702	20498	60	20915	22056	15	9850	8116	Mann-Whitney U=296, z=-1.078, p=.281

Expected Losses to Themselves: Hhs' perception of earthquake as "a threat to themselves" is more than their expected damage into building. They also think that "they can loss their life in an earthquake", which is scored higher than perceived loss of life in the building. These findings indicate that Hhs personalize earthquake risk. Indeed, their "perceived loss of life" is higher than their "expected loss of wealth" among all Hhs. Indeed, 'expectation of loss of life' is found more than 'expectation of great damage in the building' for both insured and un-insured Hhs. However, insured Hhs believe that 'they can loss their life during an earthquake' more than un-insured Hhs (Table 6.34). On the other hand, insured Hhs expect to loss their wealth more than un-insured Hhs. In addition, monetary loss prediction for 'house' and 'housing goods' are also seen higher among insured Hhs than un-insured Hhs. Expected monetary loss of Hhs to house is found as 67.884 YTL in average (Table 6.34), which is 71% of average house value in general. In addition, expected monetary loss of Hhs to housing goods is found as 20% of their expected loss to their house. Although insured and un-

insured Hhs' that posses houses with approximately same buying-selling value, insured Hhs' seem to expect more monetary loss to their houses, when this difference is statistically significant (Table 6.34).

As a result, all Hhs tend to personalize earthquake risk, because their perceived immediacy and expected losses (from Istanbul to buildings) are more than their general perceptions and expectations. However, their perceived 'losses from an earthquake' is more than 'their perceived immediacy of an earthquake'. On the other hand, insured Hhs expect an earthquake more immediate, when they also perceive more 'loss of life' to themselves and more 'monetary loss to house and housing goods'. Finally, average scores of perceived probability, perceived losses to themselves and perceived risk seem to be higher among insured Hhs. Despite, there is found no statistical difference between these average scores and ZDS purchase (Table 6.35).

Table 6.35. Perception of Earthquake Probability, Losses and Risk at Individual Level

ZDS Purchase	Perceived I Probability	Perceived Total Loss to Themselves	Perceived Total Risk
Insured Hhs	3.3458	4.2416	3.9828
Uninsured Hhs	3.3382	4.1250	3.7386
Average	3.3442	4.2168	3.9335
Difference between Insureds and Un-insureds	Mann-Whitney U=2003.5, z= -0.163, p= 0.870	Mann-Whitney U= 9305, z=-0.974, p= 0.330	Mann-Whitney U= 707.5, z= -1.889, p= 0.059

Risk Perception and Socio-Economic and Cultural Attributes of Hhs

Although insured Hhs have higher education and income level, their risk perception level seem not to change according to education and income levels. However, 'satisfaction with insurance expenditure' is inversely related with perceived total losses among insured Hhs. Insured Hhs appear to perceive more losses to themselves, when they are less satisfied with their general insurance expenditures. This can be commented as insured Hhs would like to purchase more insurance protection against earthquakes. In contrast, although un-insured Hhs perceive less losses to themselves, they seem to be less satisfied with their general insurance expenditures. Because perceived losses do not influence ZDS purchase directly, insured Hhs seem to purchase more insurance in their life as a cultural attribute, because they may be more risk averse persons and they seem to perceive more losses to themselves (Table 6.36).

Table 6.36. Socio-Economic Attributes of Households and Perceived Risk

Spearman's rho Correlation Coefficients	ZDS Purchase	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)	Satisfaction with Housing Expenditure	Satisfaction with Insurance Expenditure
Perceived Probability	Insured	-.042	-.195	.035	-.106
	Uninsured	.277	-.115	.234	-.131
Perceived Total Loss to Themselves	Insured	-.252	-.127	-.102	-.368(**)
	Uninsured	.050	.102	.030	-.031
Perceived Total Risk	Insured	-.129	-.212	-.005	-.237
	Uninsured	.089	.025	.167	-.114

** Correlation is significant at the 0.01 level (2-tailed). Insured :Listwise N = 61; Uninsured :Listwise N = 17

Table 6.37. Socio-cultural Attributes of Households and Perceived Risk

Spearman's rho Correlation Coefficient	Being Insured	Perceived l Probability	Perceived Total Loss to Themselves	Perceived Total Risk
Hierarchical World-view	Insured	.150	.400(**)	.276(*)
	Uninsured	-.320	.180	-.125
Individual World-view	Insured	.079	.287(*)	.159
	Uninsured	-.171	-.149	-.114
Fatalistic World-view	Insured	.003	.420(**)	.131
	Uninsured	-.151	.369	.132
Egalitarian World-view	Insured	.072	.301(*)	.145
	Uninsured	-.359	.011	-.287
Sense of Belonging	Insured	.070	.262(*)	.128
	Uninsured	-.040	.409	.199
Perceived Controllability in Life	Insured	.025	.286(*)	.136
	Uninsured	-.036	.201	.073
Social Influence	Insured	.155	.239	.267(*)
	Uninsured	-.447	.126	-.333

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 67 and Uninsured :Listwise N = 16

In addition, perceived total losses is found as related to socio-cultural attributes of Hhs that are involved with ZDS purchase. Although all socio-cultural world-views influence perceived losses of insured Hhs, hierarchical and fatalistic world-views have stronger and direct relationships. On the other hand, individualistic world-view is found as inversely related to perceived losses among un-insured Hhs, although this is not at a significant level. In addition, perceived total risk is found as directly related with social influence among insured Hhs at a statistically significant level, when this relationship is inverse among un-insured Hhs though not significant (Table 6.37).

Perceived Attributes of Earthquakes: According to controllability and de-emphasising scales, insured Hhs perceive earthquakes more controllable than un-insured Hhs, while un-insured Hhs seem to de-emphasise importance of earthquakes. First, higher score of insured Hhs indicates that insured Hhs perceive earthquake losses 'as a consequence of unsuitable urbanization'. Similarly, insured Hhs perceive earthquake losses 'as a consequence of not- paying attention to natural conditions'.

Second, insured Hhs perceive 'earthquake losses as more preventable in terms of scientific and technical measures' than un-insured Hhs. In contrast, un-insured Hhs believe more than insured Hhs that 'people cannot be successful against the power of nature, whatever precautions they take'. Third, higher scores of un-insured Hhs are estimated for 'perceiving earthquake risk as a new risk' and for 'perceiving occurrence of great earthquakes in Turkey as infrequent' (Table 6.38). Fourth, un-insured Hhs believe also that 'damage in the building depends on coincidences' more than insured Hhs. Moreover, un-insured Hhs tend to think that 'earthquake threat is exaggerated too much'. These findings indicate insured Hhs tend to perceive earthquake losses more predictable and controllable in general. Despite, un-insured Hhs have higher scores on perceiving 'losses in their building as preventable'. In other words, un-insured Hhs seem to believe more than insured Hhs that 'taking necessary measures can make their building safer'. Likewise, un-insured Hhs believe more than insured Hhs 'that taking necessary measures has great benefits'. Accordingly, 'perceiving that their building cannot be made safer' can cause Hhs to purchase ZDS (Table 6.38).

As a result, only difference in perception of '**human controllability through scientific and technical measures against earthquakes**' is found statistically significant for ZDS purchase behavior [Mann-Whitney U=1677, z=-2.063, p=0.039]. For this reason, ZDS purchase seems to be more involved with 'perceived controllability of earthquakes'.

Table 6.38. Perceived Attributes of Earthquakes

	All Hhs			Insured Hhs			Un-insured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
a: Perception of Human Control for Earthquakes									
The losses from earthquakes are the result of not- to-pay attention to the natural conditions	153	4.1895	.97840	120	4.2833	.88102	33	3.8485	1.22783
The losses from Earthquakes are the consequence of unsuitable urbanization and construction	161	4.4410	.85765	125	4.4800	.80922	36	4.3056	1.00909
Earthquakes provide an opportunity to people to behave in a conscious and rational way	154	3.6753	1.29293	119	3.7815	1.24981	35	3.3143	1.38843
Earthquakes are natural events that cannot be predicted before	163	4.4417	.90334	125	4.3840	.92269	38	4.6316	.81940
It is possible to take measures greatly with the scientific and technical methods against earthquakes	159	4.2893	.84454	125	4.3840	.72717	34	3.9412	1.12657
Earthquake damages can be predicted before	150	3.1733	1.33987	118	3.2712	1.30522	32	2.8125	1.42416
Precautions can make this building safer.	145	3.6069	1.19197	118	3.5932	1.19284	27	3.6667	1.20894
Taking necessary measures has great benefits.	151	3.9934	1.08626	123	3.9837	1.10871	28	4.0357	.99934
b: De-emphasizing Earthquakes									
People cannot be successful against the power of nature, whatever precautions they take	154	2.9610	1.30801	119	2.9076	1.28875	35	3.1429	1.37505
I try to not think the earthquake threat	152	3.5395	1.18981	117	3.5556	1.20662	35	3.4857	1.14716
There are more sensitive people in the family	152	3.9737	.99633	118	4.0339	.96017	34	3.7647	1.10258
The earthquake threat was not known formerly. It is a new kind of threat	153	3.4118	1.33046	118	3.3898	1.34631	35	3.4857	1.29186
Earthquake threat is exaggerated too much	153	2.2810	1.13240	117	2.2308	1.15508	36	2.4444	1.05409
Earthquakes with great losses do not occur often in Turkey	150	3.0667	1.19656	116	3.0431	1.21148	34	3.1471	1.15817
Valid N (listwise)	133			103			30		

Perceived Attributes of Earthquakes and Socio-Economic Attributes of Hhs

Hhs' perception for 'taking scientific measures can prevent losses' is directly influenced by their education level among insured Hhs. Despite, education is inversely related to perceived benefits of risk reduction measures in the building among insured Hhs (Table 6.39). This can indicate that more educated Hhs among insureds can purchase ZDS, because they can believe that vulnerability in their building cannot be preventable. This belief could arise from perceiving more losses to their buildings that cannot be preventable. In contrast, perceived losses are not related to education level of Hhs significantly among both insured and un-insured Hhs (Table 6.36).

That is, ZDS purchase decision of more educated Hhs seems to be not involved with their perception of losses. These Hhs could have less vulnerable houses. However, their ZDS purchase decision seems to be involved with perceiving earthquakes more controllable. In addition, education is inversely related to perception of earthquake as a new risk among insured Hhs. On the other hand, income is directly related to 'predictability of earthquake damages' among un-insured Hhs. That is, although higher income level Hhs among un-insureds perceive earthquake damages as predictable, this perception seem not to result in ZDS purchase (Table 6.39).

Table 6.39. Perceived Attributes of Earthquakes and Hhs' Attributes

Spearman's rho	ZDS Purchase	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)
Correlation Coefficient			
(1) Taking the required damage reduction measures has great benefits.	Insured	-.316(**)	-.086
	Uninsured	.104	.193
(2) It is possible to take measures greatly with the scientific and technical methods against earthquakes	Insured	.184(*)	.008
	Uninsured	.290	.231
(3) The earthquake threat was not known formerly. It is a new kind of threat	Insured	-.248(**)	-.122
	Uninsured	.232	-.031
(4) Earthquake damages can be predicted before	Insured	.001	.006
	Uninsured	-.123	.428(*)
N			
(1) Taking the required damage reduction measures has great benefits.	Insured	100	102
	Uninsured	23	22
(2) It is possible to take measures greatly with the scientific and technical methods against earthquakes	Insured	116	115
	Uninsured	31	29
(3) The earthquake threat was not known formerly. It is a new kind of threat	Insured	109	111
	Uninsured	32	30
(4) Earthquake damages can be predicted before	Insured	109	111
	Uninsured	29	27

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

As a result, increasing education level of Hhs can also lead increase in ZDS purchase. However, risk communication that can disseminate messages about the controllability of earthquakes with scientific and technical measures seem to increase ZDS purchase behavior of Hhs, instead of giving messages about the predictability of earthquakes.

Perceived Attributes of Earthquakes and Socio-Cultural Attributes of Hhs: Socio-cultural attributes of Hhs that influence ZDS purchase are significantly related to perceived attributes of earthquakes. First, some insured Hhs seem to purchase ZDS because of their 'fatalistic world-views', which is revealed in the relationship of 'perceived uncontrollability of earthquakes' among insured Hhs (people cannot be successful against the power of nature). Though not significant, higher correlation coefficient is observed among un-insured Hhs for the relationship between 'fatalistic world-view' and 'perceived un-controllability of earthquakes'. That is, 'higher perception of earthquakes as uncontrollable' in a 'fatalistic manner' could cause to not purchase ZDS contracts (Table 6.40). On the other hand, perceiving 'earthquake losses as the consequence of not paying attention to natural conditions and unsuitable urbanization and contruction' seem to be directly related to 'hierarchical, individualistic and egalitarian world-views' and 'sense of belonging' among insured Hhs. Moreover, 'perceived controllability of earthquakes' appears to be involved with 'individualistic and egalitarian world-views' and 'sense of belonging' among insured Hhs (Table 6.40). Likewise, 'thinking that earthquake threat is exaggerated too much' is inversely related to hierarchical and individualistic world-views and social influence among insured Hhs. However, these world-views can cause to de-emphasise earthquakes as observed in 'perception of earthquakes as a new threat', particularly among un-insured Hhs (Table 6.40). As a result, higher perceived controllability of earthquakes seems to increase ZDS purchase. However, empowering hiearchical and individualistic world-views can cause to de-emphasise earthquakes. Instead, empowering belonging feelings of Hhs to their neighborhood for participation to events and disseminating information in terms of local social events can increase the perceived controllability of earthquakes; and therefore, purchase of ZDS.

Table 6.40. Perceived Attributes of Earthquakes and Socio-Cultural Attributes of Hhs

Spearman's rho Correlation Coefficients	ZDS Purchase	Hierarchical World-view	Individualistic world-view	Fatalistic world-view	Egalitarian World-view	Sense of belonging	Social Influence
Losses from earthquakes are the result of not paying attention to natural conditions	Insured	.276(*)	.375(**)	.080	.299(**)	.186	.162
	Uninsured	.233	-.028	.066	-.308	-.016	.174
Losses from earthquakes are the consequence of unsuitable urbanization and construction	Insured	.216	.401(**)	.048	.269(*)	.225(*)	.075
	Uninsured	-.004	-.227	-.060	-.032	-.012	.161
Earthquakes provide an opportunity to behave in a conscious and rational way	Insured	.357(**)	.445(**)	.109	.370(**)	.354(**)	.168
	Uninsured	.154	.282	.095	.108	-.068	.250
It is possible to take measures greatly with the scientific and technical methods against earthquakes	Insured	.192	.364(**)	-.022	.260(*)	.220(*)	.216
	Uninsured	-.090	-.224	-.235	.062	-.121	.208
People cannot be successful against the power of nature, whatever precautions they take.	Insured	.165	.181	.283(**)	.104	.010	-.045
	Uninsured	.098	.396	.444	.306	.345	.303
Earthquake threat is exaggerated too much	Insured	-.225(*)	-.221(*)	-.029	-.205	-.139	-.233(*)
	Uninsured	.170	.020	-.164	-.181	.044	-.304
Earthquakes with great losses do not occur often in Turkey	Insured	.269(*)	.267(*)	.090	.171	.099	.126
	Uninsured	.615(**)	.400	.384	.360	.375	.107

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 82 and Uninsured :Listwise N = 19

Perceived Attributes of Earthquakes and Perceived Earthquake Risk: Among insured Hhs, perceived un-predictability of earthquakes is found as directly related to perceived losses, which is also directly related to perception of earthquakes as the result of unsuitable urbanization. Accordingly, insured Hhs that perceive earthquakes as the result of un-suitable urbanization perceived earthquakes as un-predictable and perceive more losses to themselves. In addition, these Hhs also perceive earthquakes more controllable in terms of scientific and technical measures. In contrast, higher perception of earthquake probability seem to result perceiving earthquakes uncontrollable, among un-insured Hhs and this perception does not result in ZDS purchase (Table 6. 41). On the other hand, un-insured Hhs that perceive more losses seem to believe the benefits of risk mitigation measures in their building more than insured Hhs. Despite, their decline in ZDS purchase can explain that their perceived benefits seem to different from the perceived controllability of earthquakes. On the other hand, perceiving more earthquake losses seem to be involved with another type of social influence, i.e. concern of family members with earthquakes (Table 6.41). This finding verifies the findings arise from the relationship between perceived attributes of earthquakes and socio-economic attributes of Hhs and socio-cultural attributes of Hhs (Table 6.39 and Table 6.40).

Table 6.41. Perceived Attributes of Earthquakes and Earthquake Risk Perception

Spearman's rho Correlation Coefficient	ZDS Purchase	Perceived Probability	Total Perceived Losses	Total Perceived Risk
Earthquakes are natural events that cannot be predicted before	Insured	-.036	.279(*)	.061
	Uninsured	-.047	.253	.073
The losses from earthquakes are the result of not- to-pay attention to natural conditions	Insured	.036	.538(**)	.207
	Uninsured	-.319	.203	-.232
The losses from earthquakes are the consequence of unsuitable urbanization and construction	Insured	.043	.467(**)	.178
	Uninsured	-.163	.286	-.127
It is possible to take measures with scientific and technical methods against earthquakes	Insured	.041	.528(**)	.208
	Uninsured	-.617(**)	.002	-.609(**)
Other family members are more concerned with earthquakes	Insured	.040	.534(**)	.200
	Uninsured	.363	.180	.325
Taking the required damage reduction measures has great benefits.	Insured	.006	.256(*)	.058
	Uninsured	.071	.476(*)	.245

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 71; Uninsured :Listwise N = 20

6.1.2.5. Perception of Existing ZDS System and Disaster Policies

6.1.2.5.1. Perceived Attributes of the Existing ZDS System

First, insured Hhs are found as perceiving purchase of ZDS more '**compulsory**' than un-insured Hhs. In addition, insured Hhs seem to be more 'confused with the reluctance of people to participate into ZDS system' (Table 6.42). Moreover, these two perceived attributes of ZDS indicate statistically significant differences in ZDS purchase [Mann-Whitney U=1715, z=-3.573, p=0.000; and Mann-Whitney U=1265.5, z=-3.794, p=0.000, respectively]. For 'perception of ZDS as a social solidarity mechanism', there is obtained higher scores among insured Hhs than un-insured Hhs (Table 6.42). On the other hand, **perception of ZDS as 'compulsory', 'being confused about reluctance of people' and 'perception of ZDS as a solidarity** mechanism' are related to ZDS purchase at a statistically significant level. Moreover, most powerful relationship of these variables and between ZDS purchase is found for 'perception of ZDS as compulsory [Pearson chi-square (4) 27.353, p= 0.000; Pearson chi-square (4)= 16.261, p= 0.003; and Pearson chi-square (4)= 16.482, p= 0.002; and Cramer's V=0.393; Cramer's V= 0.324; and Cramer's V=0.322, respectively].

In contrast, **trust of Hhs on ZDS**, i.e. 'use of aggregated premiums only for earthquakes', is found lower than other perceived attributes of ZDS, when many Hhs are 'uncertain' about trusting ZDS. Un-insured Hhs seem to trust ZDS system more than insured Hhs. This indicates that trust on ZDS do

influence ZDS purchase inversely (Table 6.42). However, trust of insured and un-insured Hhs on ZDS system is found statistically no significant [Mann-Whitney U=1840, z= -1.831, p= 0.067].

On the other hand, trust on ZDS system is inversely related to perceiving ZDS as compulsory among both insured and un-insured Hhs. However, trusting less on ZDS system does not involved with compulsory perception of ZDS purchase among insured Hhs significantly. However, un-insured Hhs trust on ZDS more than insured Hhs, while they do not perceive ZDS compulsory. This can be because of trusting on State will help anyway, because there is a significant difference between insured and un-insured Hhs (Table 6.42).

Table 6.42. Perceived Attributes of ZDS

	All Hhs			Insured Hhs			Uninsured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Everyone must purchase earthquake insurance.	177	4.1299	1.07664	139	4.3165	.89310	38	3.4474	1.38910
I am confused about the reluctance of people participating to the insurance system.	157	3.6561	1.25429	122	3.8525	1.20380	35	2.9714	1.20014
Insurance system is a form of social solidarity, which provides sharing the earthquake losses by all society.	157	3.7898	1.11535	122	3.8934	1.02697	35	3.4286	1.33473
Trust: I am sure that ZDS premiums will only be used for earthquakes	157	3.1910	1.17743	119	3.1008	1.14532	38	3.4736	1.24633
Valid N (listwise)	141			111			30		

In addition, perceiving ZDS compulsory seems to be related to perceiving ZDS system as a social solidarity mechanism, while this correlation causes ZDS purchase. However, insured Hhs that perceive ZDS as more compulsory perceive the ZDS system also as a social solidarity mechanism at a significant level. In the same way, perceiving ZDS purchase as compulsory and perceiving ZDS system as a solidarity mechanism are related to 'being confused about reluctance of people', among both insured and un-insured Hhs. That is, 'perception of solidarity attribute of ZDS system' and 'being confused about reluctance of people to not participate ZDS system' do not differ according to ZDS purchase behavior. This may indicate that un-insured Hhs can also perceive ZDS system as solidarity mechanism. Therefore, perception of ZDS purchase as compulsory seem to have more influence on ZDS purchase (Table 6.43).

Table 6.43. Correlations between Perceived Attributes of Existing ZDS System

Spearman's rho Correlation Coefficient	ZDS Purchase	Compulsory	Solidarity	Being Confused	Trust
Compulsory	Insured	1.000			
	Un-insured	1.000			
Solidarity	Insured	.410(**)	1.000		
	Un-insured	.336	1.000		
Being Confused	Insured	.626(**)	.578(**)	1.000	
	Un-insured	.544(**)	.522(**)	1.000	
Trust	Insured	-.080	-.078	-.165	1.000
	Un-insured	-.409(*)	.001	-.002	1.000

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 111 Uninsured :Listwise N = 30

Perceived Attributes of ZDS System and Socio-Economic Attributes of Households

Perceiving ZDS purchase as compulsory and perceiving ZDS system as a social solidarity mechanism are found as not significantly related to education level among both insured and un-insured Hhs. However, education level seems to have direct influence on perceiving ZDS purchase as compulsory, whereas education appears to have inverse influence on perceiving ZDS system as a social solidarity mechanism. This difference can indicate that Hhs in higher education levels seem not to purchase ZDS because of perceiving ZDS purchase as compulsory and ZDS system as a social solidarity mechanism. Likewise, higher education level causes more trust on ZDS system (Table 6.44), although trust was found as influencing ZDS purchase behavior, inversely (Table 6.43). Next, compulsory perception of ZDS purchase is found as inversely related to Hh income level and satisfaction with insurance expenditures, among insured Hhs, although these relationships are statistically not significant. Likewise, perception of ZDS system as a social solidarity mechanism is observed as inversely related to income level and satisfaction with insurance expenditure, among both insured and un-insured Hhs. That is, Hhs in higher income and education level seem to purchase ZDS because of their general insurance purchase behavior, whereas perceiving ZDS purchase compulsory and ZDS system as a social solidarity mechanism seem not to influence their decisions (Table 6.44; 6.45; and 6.46). However, some Hhs in higher income and education levels appear to decline in ZDS purchase because of having no general insurance purchase behavior. On the other hand, Hhs middle and lower income levels and middle and lower education levels seem to purchase ZDS because of perceiving ZDS purchase as compulsory and the ZDS system as a social solidarity mechanism. However, perceiving ZDS purchase not compulsory seem to cause some Hhs to be excluded from the financial protection of the ZDS system, particularly Hhs in middle-lower education and income levels (Table 6.44; 6.45; and 6.46).

Table 6.44. Perceived Attributes of ZDS System and Socio-Economic Attributes of Hhs

Spearman's rho Correlation Coefficient	ZDS Purchase	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)	Satisfaction with Insurance Expenditure
Compulsory	Insured	.105	-.070	-.018
	Un-insured	.070	-.015	.294
Solidarity	Insured	-.068	-.084	-.131
	Un-insured	-.007	-.131	-.019
Being Confused	Insured	-.098	-.179	-.192
	Un-insured	-.045	-.118	.246
Trust	Insured	.222(*)	.209	-.014
	Un-insured	.048	.137	-.156

* Correlation is significant at the 0.05 level (2-tailed). Insured :Listwise N = 82; Uninsured :Listwise N = 21

Table 6.45. Perceived Attributes of ZDS and Hh-Head's Education Level

ZDS Purchase	Hh-Head's Education Level	ZDS as Compulsory	ZDS as Solidarity	Being Confused	Trust
Insured	1.00 illiterate, literate, primary school	4.3667	4.0000	3.9630	3.039216
	2.00 Secondary school	4.1579	3.9286	3.6875	2.928571
	3.00 High school	4.3333	3.8750	3.7917	2.925926
	4.00 College, university, master, doctoral	4.3333	3.7619	3.6000	3.619048
	Total	4.3231	3.9211	3.8246	3.106195
Uninsured	1.00 illiterate, literate, primary school	3.3200	3.4762	3.0000	3.500000
	2.00 Secondary school	3.6000	3.2857	3.0000	3.400000
	3.00 High school	4.2000	3.8000	3.2000	3.200000
	4.00 College, university, master, doctoral	2.0000	1.0000	2.0000	4.333333
	Total	3.4054	3.4118	2.9706	3.513514

Table 6.46. Perceived Attributes of ZDS and Hh-Head's Income Level

ZDS Purchase	Hh Income Level	ZDS as Compulsory	ZDS as Solidarity	Being Confused	Trust
Insured	1.00 > 2000 YTL	4.1875	3.2857	3.2143	3.384615
	2.00 2000-1000 YTL	4.3750	3.9310	3.7419	3.357143
	3.00 999-751 YTL	4.3143	3.9677	4.0690	3.312500
	4.00 750-500 YTL	4.4545	4.3333	4.1000	2.631579
	5.00 > 499 YTL	4.2727	3.6667	4.2778	2.631579
	Total	4.3307	3.8938	3.9107	3.099099
Uninsured	1.00 > 2000 YTL	3.0000	2.5000	2.5000	4.200000
	2.00 2000-1000 YTL	3.6667	4.0000	3.0000	3.400000
	3.00 999-751 YTL	3.4286	3.8571	3.2857	3.333333
	4.00 750-500 YTL	3.8182	3.1000	3.1000	2.909091
	5.00 > 499 YTL	3.4286	3.7143	3.1250	4.000000
	Total	3.5278	3.4545	3.0606	3.500000

Perceived Attributes of ZDS System and Socio-Cultural Attributes of Hhs

Perceiving ZDS purchase as compulsory and perceiving the ZDS system as a social solidarity mechanism are found as related to 'hierarchical and individualistic world-views' among insured Hhs. This finding can indicate that these attributes of ZDS system are understood by Hhs whose socio-cultural attributes are more hierarchical and individualistic. In addition, egalitarian world-view is observed as directly related to 'perceiving ZDS purchase as compulsory' among insured Hhs. However, egalitarian world-view seems also to be related to perceiving social solidarity attribute of ZDS among un-insured Hhs. That is, perceiving ZDS as a social solidarity mechanism because of an egalitarian world-view can result in declining ZDS purchase, if these Hhs do not perceive compulsory purchase attribute of ZDS (Table 6.47).

Table 6.47. Perceived Attributes of ZDS and Socio-Cultural World-views

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS as Compulsory	ZDS as Solidarity	Being Confused	Trust
Hierarchical world-view	Insured	.354(**)	.278(**)	.427(**)	-.104
	Uninsured	.266	.214	.187	.161
Individualistic World view	Insured	.352(**)	.369(**)	.379(**)	-.163
	Uninsured	.221	.251	.239	.000
Fatalistic world-view	Insured	.147	.294(**)	.114	-.271(*)
	Uninsured	.347	.615(**)	.454(*)	-.236
Egalitarian world-view	Insured	.265(*)	.188	.318(**)	-.015
	Uninsured	.311	.530(*)	.262	.184
Sense of Belonging	Insured	.161	.061	.230(*)	.119
	Uninsured	.291	.429	.344	.064
Perceived Controllability in Life	Insured	.030	.206	.256(*)	.128
	Uninsured	.009	.315	.248	.562(**)

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 88 and Uninsured :Listwise N = 20

On the other hand, these un-insured Hhs that perceive ZDS system as a social solidarity mechanism seem to have a fatalistic world-view (Table 6.47). That is, un-insured Hhs may tend to think that ZDS system is established, because there is nothing to do against earthquakes. This assumption can be understood through the comparison of their perceived attributes of ZDS system and risk perception levels (Table 6.48).

Perceived Attributes of ZDS System and Earthquake Risk Perception

Perceiving ZDS as solidarity mechanism was found as related to fatalistic world-view among both insured and un-insured Hhs (Table 6.47). Despite, this relationship was more significant among un-insured Hhs. Perception of ZDS system as a social solidarity mechanism is found as related to perceived risk among un-insured Hhs. Since they perceive less losses to themselves, their perceived risk level can be influenced by their perceived probability of earthquakes. In other words, un-insured Hhs appears to think that they will not benefit from ZDS system because of perceiving less losses to themselves (Table 6.48). For this reason, they may feel themselves outside of the solidarity mechanism of ZDS system. Hence, ZDS system seems to be perceived by un-insured Hhs as a solidarity system for other people in society, who will have more losses.

Table 6.48. Perceived Attributes of ZDS and Perceived Earthquake Risk

Spearman's rho Correlation Coefficient	ZDS Purchase	Perceived Probability	Perceived Losses to Themselves	Perceived Risk	Perceived Controllability of Earthquakes
Compulsory	Insured	-.060	.302(**)	.062	.364(**)
	Uninsured	.009	.217	.121	.098
Solidarity	Insured	-.037	.412(**)	.093	.300(**)
	Uninsured	.267	.394	.461(*)	-.167
Being Confused	Insured	.097	.366(**)	.194	.415(**)
	Uninsured	.283	.363	.494(*)	-.186
Trust	Insured	.020	-.200	-.063	-.049
	Uninsured	-.054	.181	.075	.289

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 78; Uninsured :Listwise N = 19

Moreover, being confused about the reluctance of people to not participating ZDS system is also found as related to perceived risk among un-insured Hhs. That is, perception of higher probability of earthquakes by un-insured Hhs appears to result in perceiving themselves outside the solidarity mechanism of ZDS system. On the other hand, their perceived earthquake risk is found as not related with perception of ZDS purchase compulsory. That is, since un-insured Hhs do not perceive ZDS purchase compulsory, they can fail to perceive their losses and the controllability of earthquakes, which can result in perceiving ZDS system as a social solidarity mechanism for other people but not for themselves (Table 6.48).

In contrast, insured Hhs that believe ZDS is a social solidarity mechanism are less fatalistic than un-insured Hhs (Table 6.47). Insured Hhs perceive more losses to themselves, when they also perceive earthquakes more controllable. Indeed, their perception of losses and controllability of earthqakes are related to their perception of ZDS purchase as compulsory and ZDS system as a solidarity mechanism. Thus, their confusion with the reluctance of people seems to be also related with their perceived losses and perceived controllability of earthquakes. In other words, perceiving ZDS as compulsory seems to increase awareness for personal losses from earthquakes and for perceived controllability of earthquakes. Therefore, these Hhs do not feel themselves outside the solidarity mechanism of ZDS system, which appears to result in ZDS purchase (Table 6.48).

6.1.2.5.2. Perceived Responsibilities in Disaster Policy Context

With respect to perceived responsibilities for protection from earthquake losses, all Hhs perceive Istanbul Metropolitan Municipality (IMM) and the State as more responsible than other institutions and agents. In addition, they perceive ZDS/DASK as less responsible than IMM, State, District Municipality, developers as well as homeowners. However, certain differences are observed among insured and un-insured Hhs in their perceived responsibilities for protection from earthquake losses. Insured Hhs perceive responsibility of 'State' and 'ZDS/DASK' more than un-insured Hhs, whereas un-insured Hhs perceive responsibility of 'IMM', 'district municipality' and 'developers' higher than insured Hhs. However, un-insured Hhs also perceive 'ZDS/DASK' as responsible, although they are not insured (Table 6.49).

Table 6.49. Perceived Responsibilities for Protection from Earthquake Losses

	All Hhs			Insured Hhs			Uninsured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Quarter Headman	132	2.9848	1.27204	105	3.0190	1.26324	27	2.8519	1.32153
District Municipality	146	4.1986	.86797	116	4.1983	.89656	30	4.2000	.76112
IMM	147	4.4082	.81724	116	4.3793	.84086	31	4.5161	.72438
Central Government	147	4.3810	.87063	116	4.3879	.87249	31	4.3548	.87744
Building Inspection Firms	137	3.8175	1.06563	109	3.8073	1.09271	28	3.8571	.97046
ZDS/DASK	139	3.8633	1.06459	110	3.8909	1.11162	29	3.7586	.87240
Universities	133	3.0075	1.33426	106	3.1226	1.30714	27	2.5556	1.36814
Media	131	3.0229	1.21190	103	3.0485	1.22377	28	2.9286	1.18411
Architectures and Engineers	135	3.8222	1.17096	106	3.8679	1.15532	29	3.6552	1.23276
Developers	135	4.1704	.90224	106	4.1981	.95039	29	4.0690	.70361
Homeowners	130	3.9692	1.14755	101	4.0099	1.11799	29	3.8276	1.25553
Valid N (listwise)	97			75			22		

In addition, insured Hhs perceive 'homeowners' more responsible. In addition, un-insured Hhs can be distinguished with their lower perceived responsibility of 'building inspection firms' and 'architectures and engineers' (Table 6.49). However, there is found statistically no significant difference between insured and un-insured Hhs in their perception of responsibilities. Despite, there is found statistically significant relationship between perceived responsibility of 'IMM' and 'DASK' for ZDS purchase [Pearson chi-square (4)= 9.681, p= 0.046; and Pearson chi-square (4)= 9.871, p= 0.043, respectively]. In addition, perceiving ZDS as responsible has more influence on ZDS purchase behavior than the influence of IMM [Cramer's V= 0.266 and Cramer's V= 0.257, respectively]. Moreover, perceiving ZDS/DASK as responsible for protection from losses is found as related to perceiving IMM and State responsible among both insured and un-insured Hhs. Despite, perceiving ZDS/DASK as responsible seems to be involved with perceiving homeowners as responsible, among insured Hhs (Table 6.50).

Table 6.50. Correlations between Perceived Responsibilities

	ZDS Purchase	IMM	State	ZDS/ DASK	Homeowners
IMM	Insured	1.000			
	Uninsured	1.000			
State	Insured	.764(**)	1.000		
	Uninsured	.848(**)	1.000		
ZDS/DASK	Insured	.624(**)	.611(**)	1.000	
	Uninsured	.538(**)	.544(**)	1.000	
Homeowners	Insured	.282(**)	.316(**)	.334(**)	1.000
	Uninsured	.397(*)	.291	.302	1.000

Spearman's rho Correlation Coefficient ** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed). Insured :Listwise N = 92; Uninsured :Listwise N = 28

'Perception of ZDS purchase as compulsory' and 'being confused about reluctance of people' are found as directly related to 'perceived responsibility of ZDS' for protection from losses, among insured Hhs. In addition, perceiving ZDS as compulsory seems to result in perceiving universities, architectures and engineers and developers as responsible for protection from earthquake losses. This can arise from perceived controllability of earthquakes with scientific and technical measures among insured Hhs. Therefore, these Hhs perceive other actors that are involved with taking structural measures as responsible. In other words, perceived compulsory purchase attribute of ZDS seems to increase awareness of insured Hhs for other actors involved in the pre-disaster process (Table 6.51). In the same way, perceived losses to themselves is found as directly related to perceived responsibility of ZDS/DASK for protection from losses among insured Hhs (Table 6.52).

In addition, although both insured and un-insured Hhs perceive 'homeowners' as responsible for protection from losses, they seem to have different causes. Among insured Hhs, who have trust on ZDS system seem to perceive homeowners more responsible, whereas this perception is not related to perceived compulsory purchase attribute of ZDS (Table 6.49). However, trust on ZDS system was found as not related to ZDS purchase significantly (Table 6.42), when trust on ZDS was also inversely related to perception of ZDS purchase as compulsory (Table 6.43). Besides, insured Hhs that have higher income amount are observed as perceiving homeowners more responsible (Table 6.52). Indeed, insured Hhs in higher income levels were also found as not influenced by compulsory purchase attribute of ZDS (Table 6.44 and 6.46). These findings indicate that insured Hhs that have higher income level perceive homeowners as responsible for financial protection from earthquake losses. On the other hand, un-insured Hhs were found as perceiving themselves outside of the social solidarity mechanism of ZDS system (Table 6.47 and 6.48).

Table 6.51. Perceived Attributes of ZDS and Responsibilities for Protection from Losses

Spearman's rho Correlation Coefficient	ZDS Purchase	Compulsory perception of ZDS	Social solidarity of ZDS	Being confused	Trust
Istanbul Metropolitan Municipality	Insured	.193	.044	.123	.091
	Uninsured	.027	.149	-.174	.209
State	Insured	.139	.046	.172	.187
	Uninsured	-.102	.068	-.135	.327
ZDS/DASK	Insured	.262(*)	.037	.226(*)	-.022
	Uninsured	.287	.113	-.033	.013
Homeowners	Insured	.162	-.072	.105	.306(**)
	Uninsured	.218	.464(*)	.130	.241
Universities	Insured	.277(*)	-.012	.214	.102
	Uninsured	.312	-.134	.259	-.110
Architectures and Engineers	Insured	.262(*)	.078	.302(**)	-.186
	Uninsured	.206	-.079	.409	.226
Developers	Insured	.227(*)	-.079	.092	-.041
	Uninsured	.323	.258	.226	.252

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 76; Uninsured :Listwise N = 21

However, their perceived responsibility of homeowners seem to be involved with their perception of ZDS system as a social solidairty mechanism (Table 6.51). These findings indicate that un-insured Hhs seem not to perceive themselves responsible for financial protection, but they appear to perceive other homeowners that can more losses from earthquakes as responsible for financial protection from earthquake losses. For this reason, their perceived responsibility for homeowners seem not to result in ZDS purchase.

Perceived Responsibility for Post-disaster Activities

DASK is perceived as more responsible for post-disaster activities than its perceived responsibility for protection from earthquake losses. Despite, Hhs perceive State and Istanbul Metropolitan Municipality as more responsible than DASK. However, they perceive themselves not so responsible for post-disaster activities. In addition, insured Hhs seem to perceive DASK and State more responsible for post-disaster activities. In contrast, un-insured Hhs appear to perceive IMM and homeowners more responsible for post-disaster activities (Table 6.53). As a result, ZDS purchase is found as directly related to perceived responsibility of 'State' and 'DASK' for post-disaster activities at statistically significant levels [Pearson chi-square (1) =5.488, p= 0.019, phi = 0.209 and Pearson chi-square (1) =5.589, p=0.018, Phi =0.206, respectively]. In contrast, perceived responsibility of 'homeowners' and 'IMM' for post-disaster activities are inversely related to ZDS purchase, but at statistically significant levels [Pearson chi-square (1) = 5.096, p=0.024; Phi =-0.198 and Pearson chi-square (1)=4.441, p=0.035, Phi=-0.196, respectively].

Table 6.52. Perceived Responsibilities for Protection from Losses and Household Attributes

Spearman's rho	ZDS Purchase	Istanbul Metropolitan Municipality	Central Government	ZDS/ DASK	Homeowners
Correlation Coefficient					
Perceived total loss to themselves	Insured	.126	.189	.300(**)	-.088
	Uninsured	.269	.253	.010	.313
Perceived risk	Insured	-.227(*)	-.173	.115	-.071
	Uninsured	-.192	-.069	-.264	-.333
Income Amount (Av. of Income Levels)	Insured	-.146	-.070	-.131	.212(*)
	Uninsured	.088	-.026	.196	.155
Satisfaction with Insurance Expenditure	Insured	.117	.091	.068	.161
	Uninsured	.043	.076	.043	.156
N					
Perceived total loss to themselves	Insured	83	82	80	75
	Uninsured	20	20	19	20
Perceived risk	Insured	81	80	78	73
	Uninsured	19	19	18	19
Income Amount (Av. of Income Levels)	Insured	107	107	102	94
	Uninsured	26	26	24	24
Satisfaction with Insurance Expenditure	Insured	93	92	91	82
	Uninsured	26	26	25	26

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

Table 6.53. Perceived Responsibility for Post-Disaster Activities

Actors/ Institutions	(Yes Answer)	Being Insured		Total
		Insured	Uninsured	
State	Count	105	23	128
	% within Being Insured	86.8	67.6	82.6
	% of Total	67.7	14.8	82.6
IMM	Count	72	28	100
	% within Being Insured	59.5	82.4	64.5
	% of Total	46.5	18.1	64.5
ZDS/ DASK	Count	76	13	89
	% within Being Insured	62.8	38.2	57.4
	% of Total	49.0	8.4	57.4
District Municipality	Count	55	14	69
	% within Being Insured	45.5	41.2	44.5
	% of Total	35.5	9.0	44.5
Homeowners	Count	8	7	15
	% within Being Insured	6.6	20.6	9.7
	% of Total	5.2	4.5	9.7

Perceived Priority of Sources for Compensation of Earthquake Losses

ZDS/DASK is perceived by insured Hhs as the prior source for financial compensation of earthquake losses, whereas un-insured Hhs perceive 'their own assets and financial accumulation' as their prior source. However, 'owned assets' and 'State aid' are also perceived by insured Hhs as second prior source. State-aid is also perceived as second prior source by un-insured Hhs. In addition, un-insured Hhs perceive 'relatives/friends' as their third prior source. whereas ZDS is found as their fourth prior source (Table 6.54). Indeed, perceiving relatives and friends differ among insured and un-insured Hhs at a statistically significant level [Mann-Whitney U=1096, z= -2.210, p= 0.027]. On the other hand, insured Hhs give 'other insurances' more priority. Among these perceived sources, priority of ZDS/DASK is related to ZDS purchase at a statistically significant level [Pearson chi-square (5)= 21.856, p=0.001].

Table 6.54. Perceived Priority of Sources for Compensation of Earthquake Losses

	All Hhs			Insured Hhs			Uninsured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
My Own Assets and Financial Accumulation	137	4.9197	1.83935	105	4.8190	1.89524	32	5.2500	1.62640
Relatives / Friends	122	3.7377	1.89302	89	3.5169	1.90163	33	4.3333	1.76186
Bank Credit/ Loan	116	2.6897	1.80537	88	2.7727	1.79864	28	2.4286	1.83442
Priority of ZDS/DASK	146	5.0959	1.67055	120	5.3667	1.38984	26	3.8462	2.23951
Other Insurances	88	3.6818	2.14179	66	3.8636	2.17600	22	3.1364	1.98315
State Aid	148	4.7297	1.83538	116	4.8190	1.78203	32	4.4063	2.01381
Valid N (listwise)	79			59			20		

In addition, perception of 'relatives/friends' as prior source is found as directly related with 'banking and credits' as prior sources among both insured and un-insured Hhs. This correlation is stronger among un-insured Hhs. In contrast, perception of 'ZDS' as prior source is correlated with perception of 'other insurances' and 'State-aid' as prior source among un-insured Hhs. On the other hand, perceived priority of ZDS and State aid are directly related among insured Hhs significantly, whereas perceived priority of State-aid and owned assets are inversely related among un-insured Hhs significantly. That is, insured Hhs seem to perceive ZDS not only as their prior source for financial compensation of losses but also as a condition to get State-aid. In contrast, un-insured Hhs expect less State-aid, when they give priority to their owned assets. In addition, priority of ZDS and other insurances are directly related among un-insured Hhs, significantly. In other words, un-insured Hhs perceive ZDS as not different from other insurances, when they give priority neither to ZDS nor other insurances (Table 6.55).

Table 6.55. Correlations between Perceived Priority of Sources

Spearman's rho	ZDS Purchase	My Own Assets and Financial Accumulation	Relatives / Friends	Bank Credit/ Loan	Priority of ZDS/DASK	Other Insurances	State Aid
Owned Assets and Accumulation	Insured	1.000					
	Uninsured	1.000					
Relatives / Friends	Insured	.238	1.000				
	Uninsured	.443	1.000				
Bank Credit/ Loan	Insured	-.003	.279(*)	1.000			
	Uninsured	.428	.449(*)	1.000			
Priority of ZDS/DASK	Insured	.035	-.227	-.167	1.000		
	Uninsured	.364	.212	.333	1.000		
Other Insurances	Insured	.048	.028	.187	.155	1.000	
	Uninsured	.443	-.019	.289	.609 (**)	1.000	
State Aid	Insured	-.093	.101	-.184	.314(*)	.035	1.000
	Uninsured	-.505(*)	.212	-.007	.014	-.351	1.000

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 59. Uninsured :Listwise N = 20

Therefore, giving priority to ZDS among insured Hhs can be because of having less financial accumulation and income amount. Likewise, un-insured Hhs can be expected more financial accumulation and income amount. However, there is found no significant relationship between 'priority of ZDS' and income level among both insured and un-insured Hhs (Table 6.56). However, insured Hhs give more priority to ZDS in all income levels, whereas un-insured Hhs give more priority to ZDS in middle income levels. In contrast, un-insured Hhs in all income levels give more priority to their own

assets and financial accumulation than insured Hhs. On the other hand, insured Hhs in all income levels –except first income level- expect more State aid than un-insured Hhs (Table 6.57).

Table 5.56. Priority of Sources and Household Attributes

Spearman's rho Correlation Coefficients	ZDS Purchase	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)	Satisfaction with Insurance Expenditures
My Own Assets and Financial Accumulation	Insured	.170	.111	.226
	Uninsured	.288	.234	.102
Priority of ZDS/DASK	Insured	.096	.100	.228
	Uninsured	.088	-.313	.051
State Aid	Insured	-.056	-.148	.187
	Uninsured	.416	-.349	-.344

Insured :Listwise N = 71, Uninsured :Listwise N = 19

Next, giving priority to ZDS is found as not related to earthquake risk perception of insured and un-insured Hhs. Despite, perceiving probability of earthquakes and perceived risk seem to be inversely involved with giving priority to ZDS among un-insured Hhs, though this relationship is not significant. In addition, there is also found no relationship between perceived earthquake risk and priority of State-aid. However, inverse relationship between State-aid and perceived losses among insured Hhs (though not significant) can indicate that insured Hhs do not perceive State-aid because of perceiving losses instead of perceiving more probability (Table 6.58). Since perceived losses seems to be involved with ZDS purchase (Table 6.34). In contrast, un-insured Hhs seem to expect State-aid because of direct relationship between State-aid and perceived probability and risk of earthquakes, though not significant (Table 6.58).

Table 6.57. Priority of Sources and Household Income Level

ZDS Purchase	Hh Income Level	Distribution of Mean Value		
		My Own Assets and Financial Accumulation	Priority of ZDS/DASK	State Aid
Insured	1.00 > 2000 YTL	4.7500	5.1667	3.5455
	2.00 2000-1000 YTL	4.8929	5.5926	5.1786
	3.00 999-751 YTL	5.2903	5.1875	4.6786
	4.00 750-500 YTL	4.9286	5.4762	5.1905
	5.00 > 499 YTL	3.4545	5.3529	5.0556
	Total	4.8437	5.3670	4.8585
Uninsured	1.00 > 2000 YTL	4.7500	1.4000	3.0000
	2.00 2000-1000 YTL	5.3333	6.0000	6.0000
	3.00 999-751 YTL	5.8571	5.2000	4.8889
	4.00 750-500 YTL	5.0833	4.4000	4.3000
	5.00 > 499 YTL	4.7500	3.3333	4.3333
	Total	5.2000	3.9600	4.4194

Perceived controllability of earthquakes is found as related to percieved priority of 'owned assets and financial accumulation' among insured Hhs (Table 6.58). However, giving priority to owned assets seemed to be related to income level (Table 6.57). That is, some insured Hhs that perceive earthquakes controllable seem to give more priority to their owned assets in compensation of earthquake losses, although they also purchase ZDS. On the other hand, un-insured Hhs that perceive earthquakes controllable seem to give priority to other insurances. However, the Hhs that do not purchase ZDS cannot purchase other insurances according to the existing ZDS system. Therefore, these un-insured Hhs seem to perceive less losses to themselves.

Table 6.58. Priority of Sources and Perceived Risk

Spearman's rho Correlation Coefficient	ZDS Purchase	My Own Assets and Financial Accumulation	Priority of ZDS/DASK	Other Insurances	State Aid
Perceived Controllability of Earthquakes	Insured	.358(*)	.082	.080	-.024
	Uninsured	.327	.329	.582(*)	-.490
Perceived Probability	Insured	.008	.018	-.034	-.035
	Uninsured	-.192	-.410	-.506	.380
Perceived total loss to themselves	Insured	.146	.090	-.046	-.017
	Uninsured	.362	.161	-.194	-.521
Perceived risk	Insured	.045	.048	-.030	-.058
	Uninsured	-.175	-.470	-.670(*)	.120

* Correlation is significant at the 0.05 level (2-tailed). Insured :Listwise N = 35 and Uninsured :Listwise N = 12

In the same way, an inverse relationship is observed between perceived lossses and priority of other insurances among un-insured Hhs, though not significant. However, these un-insured Hhs that give priority to other insurances are observed as perceiving less earthquake risk, which is seen in their inverse relationship (Table 6.58).

Table 6.59. Priority of Sources and Perceived Responsibilities for Compensation

Perceived Responsibilities for Compensation	ZDS Purchase	Priority of Sources			
		My Own Assets and Financial Accumulation	Priority of ZDS/DASK	Other Insurances	State Aid
Istanbul Metropolitan Municipality	Insured	.012	.009	-.099	.188
	Uninsured	.232	.124	.115	-.184
Central Government	Insured	.206	-.073	-.032	.057
	Uninsured	.202	.038	.071	-.071
DASK	Insured	.238	.054	-.182	.083
	Uninsured	.036	.211	.346	.122
Homeowners	Insured	.161	-.020	.157	-.164
	Uninsured	.271	.540	.185	-.228

Spearman's rho - Correlation Coefficient - Insured :Listwise N = 44; Uninsured :Listwise N = 13

Table 6.60. Priority of Sources and Perceived Responsibilities for Post-Disaster Activities

Being Insured	*Perceived Responsibilities for Post-Disaster Activities*	Distribution of Mean Value					
		My Own Assets and Financial Accumulation	Relatives /Friends	Bank Credit/ Loan	Priority of ZDS/DASK	Other Insurances	State Aid
Insured Hhs	*DASK*	4.750	3.615	2.843	5.364	3.784	4.631
	State (Central Government)	4.896	3.642	2.746	5.405	3.898	4.977
	IMM	4.618	3.479	3.070	5.397	3.857	4.862
	Homeowners	4.333	4.400	1.600	6.000	4.400	5.286
Un-insured Hhs	*DASK*	4.375	3.333	1.625	3.875	2.400	4.375
	State (Central Government)	4.647	3.647	1.929	3.933	3.000	4.600
	IMM	5.053	4.136	2.333	4.235	2.929	4.450
	Homeowners	5.167	5.000	3.250	3.500	3.000	5.167

On the other hand, Hhs in the sample that perceive ZDS as their prior source for post-disaster compensation, perceive ZDS purchase also as compulsory [Spearman's rho= 0.249, p<0.01]. In addition, perceived priority of ZDS is also related to being confused about the reluctance of people to not participate ZDS system [Spearman's rho=0.254, p<0.001]. Moreover, perceived priority of ZDS is found as inversely related to having trust on ZDS system [Spearman's rho= -0.246, p<0.001]. In adddition, giving priority to ZDS was also expected to be involved with perceived responsibilities of institutions for protection from earthquake losses. However, there is observed no significant relationship among both insured and un-insured Hhs (Table 6.59). Giving more priority to ZDS was expected also to be involved with perceived responsibilities for post disaster activities. However, given priority to ZDS does not differ according to perceived responsibilities for post-disaster activities (Table 6.60).

6.1.3. 'Behavior and Intention' of Households and ZDS Purchase

6.1.3.1. General Risk Aversion of Households

In addition to their ZDS purchase behavior, insured Hhs seem to take other risk aversion measures such as 'slatted shutters in windows' and 'diaphone for building door' (Table 6.61). In addition, having first aid kit at home is also related with ZDS purchase at a statistically significant level [Pearson chi-square (1)= 5.510, p= 0.019, Phi= 0.177]. Likewise, insured Hhs are also observed as purchasing more insurance than un-insured Hhs. Most of these insurance purchase behavior is found as related with ZDS purchase at statistically significant levels. Particularly purchase of house insurance,

additional earthquake insurance, insurance for housing goods, accident insurance, fire insurance and theft insurance are found higher among Hhs with ZDS (Table 6.62).

Table 6.61. Risk Aversion Behavior At Home and ZDS Purchase

Risk Aversion at Home	(Yes Answer)	Being Insured		Total
		Insured	Uninsured	
Steel Apartment Door	Count	105	30	135
	% within insured Being Insured	76.6	78.9	77.1
	% of Total	60.0	17.1	77.1
First Aid Kit At Home	Count	40	4	44
	% within insured Being Insured	29.2	10.5	25.1
	% of Total	22.9	2.3	25.1
Fire Extinguisher At Home	Count	10	5	15
	% within insured Being Insured	7.3	13.2	8.6
	% of Total	5.7	2.9	8.6
House Alarm	Count	10	3	13
	% within insured Being Insured	7.3	7.9	7.4
	% of Total	5.7	1.7	7.4
Slatted Shutters or Window-guard in Windows	Count	25	6	31
	% within insured Being Insured	18.2	15.8	17.7
	% of Total	14.3	3.4	17.7
Diaphone or Display Screen for Security at the Building Door	Count	47	10	57
	% within insured Being Insured	34.3	26.3	32.6
	% of Total	26.9	5.7	32.6

With respect to insurance types involved with car, Hhs that purchase ZDS seem to purchase traffic insurance more than un-insured Hhs. Likewise, voluntary car insurance, i.e. Kasko, is purchased mostly by Hhs, who purchase ZDS (Table 6.63).

Indeed, car ownership was found higher among Hhs that purchased ZDS. Traffic insurance and Kasko insurance are found as related to ZDS purchase at statistically significant levels [Pearson chi-square (1)= 4.121, p= 0.042; Phi= 0.248 and Pearson chi-square (1) = 15.365, p= 0.000; Phi= 0.528, respectively]. Particularly Kasko purchase is more distinguishable among Hhs that purchased ZDS. If insurance purchase can be commented as a life-style, Hhs with ZDS seem to have such a life-style. Accordingly, Hhs in higher education and income levels purchase more insurance and they are also more satisfied with insurance expenditures in their life (Table 6.64).

Table 6.62. Purchase of Other Insurances and ZDS Purchase

Purchased Insurance Types	(Yes Answer)	Being Insured		Total
		Insured	Uninsured	
Additonal Earthquake Insurance	Count	52	1	53
	% within Being Insured	44.8	3.7	37.1
	% of Total	36.4	0.7	37.1
Life / Retirement Insurance	Count	45	5	50
	% within Being Insured	38.5	18.5	34.7
	% of Total	31.3	3.5	34.7
Insurance of the House Furniture	Count	31	1	32
	% within Being Insured	26.7	3.7	22.4
	% of Total	21.7	0.7	22.4
House Insurance	Count	55	2	57
	% within Being Insured	47.4	7.4	39.9
	% of Total	38.5	1.4	39.9
Health Insurance	Count	48	16	64
	% within Being Insured	41.4	59.3	44.8
	% of Total	33.6	11.2	44.8
Fire Insurance	Count	31	1	32
	% within Being Insured	26.7	3.7	22.4
	% of Total	21.7	0.7	22.4
Business Insurance	Count	14	4	18
	% within Being Insured	12.1	14.8	12.6
	% of Total	9.8	2.8	12.6
Accident Insurance	Count	23	0	23
	% within Being Insured	19.8	0.0	16.1
	% of Total	16.1	0.0	16.1
Theft Insurance	Count	28	1	29
	% within Being Insured	24.1	3.7	20.3
	% of Total	19.6	0.7	20.3

Table 6.63. Purchase of Car Insurance According to ZDS Purchase

Car Insurance Types	(Yes Answer)	Being Insured		Total
		Insured	Uninsured	
Car Insurance	Count	57	9	66
	% within Being Insured	100.0	100.0	100.0
	% of Total	86.4	13.6	100.0
Traffic Insurance	Count	55	8	63
	% within Being Insured	96.5	80.0	94.0
	% of Total	82.1	11.9	94.0
Kasko	Count	44	1	45
	% within Being Insured	78.57	10.00	68.18
	% of Total	66.67	1.52	68.18
EQ Insurance for Car	Count	25	1	26
	% within Being Insured	47.2	10.0	41.3
	% of Total	39.7	1.6	41.3

Table 6.64. General Insurance Purchase and Household Attributes

Spearman's rho Correlation Coefficient	ZDS Purchase	Number of purchased insurance types (#)
Education of Hh-Head by Years	Insured	.280(*)
	Uninsured	-.216
Income Amount (Av. of Income Levels)	Insured	.320(**)
	Uninsured	.083
Satisfaction with Housing Expenditures	Insured	.088
	Uninsured	.240
Satisfaction with Insurance Expenditures	Insured	.312(*)
	Uninsured	.151

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 67 and Uninsured :Listwise N = 17

In addition, although Hhs with individualistic world-view were expected as purchasing more insurance than other Hhs, there is found no significant relationship. Despite, individualistic world-view is inversely related to the number of purchased insurance types among un-insured Hhs. That is, although they tend to be individualistic, they do not purchase insurance in their life. On the other hand, egalitarian world-view, perceived controllability and social environment seem to influence general insurance purchase of Hhs that purchased ZDS, significantly (Table 6.65).

Table 6.65. General Insurance Purchase Behavior and Socio-cultural World-views

Spearman's rho Correlation Coefficient	ZDS Purchase	Number of purchased insurance types (#)
Hierarchical World-view	Insured	.104
	Uninsured	-.386
Individualistic World-view	Insured	.230
	Uninsured	-.707(**)
Fatalistic World-view	Insured	-.142
	Uninsured	.031
Egalitarian World-view	Insured	.264(*)
	Uninsured	.075
Sense of Belonging	Insured	.166
	Uninsured	.024
Perceived Controllability in Life	Insured	.233(*)
	Uninsured	-.395
Social Influence	Insured	.319(**)
	Uninsured	.434

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 73 and Uninsured :Listwise N = 14

Table 6.66. General Insurance Purchase and Earthquake Risk Perception

Spearman's rho	ZDS Purchase	Perceived probability	Perceived total loss to themselves	Perceived Risk	Perceived Controllability of Earthquakes
Correlation Coefficient					
Insurance types (#)	Insured	.086	.119	-.033	.246(*)
	Uninsured	-.081	-.113	-.138	-.163
N					
Insurance types (#)	Insured	86	61	60	87
	Uninsured	17	13	13	17

* Correlation is significant at the 0.05 level (2-tailed).

Although these Hhs that purchase insurance in general were expected to perceive more losses to themselves from earthquakes, there is found no significant relationship between their perceived earthquake losses and general insurance purchase. Despite, these households are found as 'perceiving earthquakes more controllable' than other Hhs at a statistically significant level. In contrast, purchasing insurance in general seem to be inversely involved with perceived controllability of earthquakes mong un-insured Hhs, though not significant. That is, although some un-insured Hhs seem to purchase other insurance types, their decline in ZDS purchase seem to be involved with their perception of earthquakes as uncontrollable with scientific and technical measures (Table 6.66).

Table 6.67. General Insurance Purchase and Perception of ZDS

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS as compulsory	ZDS as social solidarity	Being confused	Trust
Insurance types (#)	Insured	.148	-.142	-.005	.027
	Uninsured	-.026	-.126	-.310	-.247

Insured :Listwise N = 80 and Uninsured :Listwise N = 19

In addition, purchasing insurance in daily life seem to be not related with 'perceived attribute of ZDS as compulsory and as a social solidarity mechanism'. For this reason, Hhs that purchase ZDS because of their general insurance purchase behavior in their life seem not to influence by their perception of compulsory attribute of ZDS purchase (Table 6.67). However, these Hhs appear to have also higher income level (Table 6.64). Thus, finding verifies the assumptions made with Tables 6.42 and 6.44 as higher higher income level Hhs purchase ZDS because of their general insurance purchase behavior. Indeed, these Households purchase voluntary insurance in general. Despite, Hhs that purchased ZDS and additional house and earthquake insurance for their houses, seem to perceive ZDS purchase as compulsory (Table 6.67).

Table 6.68. General Insurance Purchase and Perceived Responsibilities for Protection from Earthquake Losses

Spearman's rho Correlation Coefficient	*ZDS Purchase*	District Municipality	Istanbul Metropolitan Municipality	Central Government	DASK	Homeowners
Insurance types (#)	Insured	.310(*)	.178	.152	.206	.383(**)
	Uninsured	.049	-.052	-.028	.244	.000

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 66 and Uninsured :Listwise N = 15

Likewise, Hhs that purchased ZDS seem to have also house insurance, when these Hhs perceive ZDS more compulsory and as a social solidarity mechanism. Hence, perceiving these attributes of ZDS seem to cause purchasing additional insurance protections for their house. Particularly, 'perception of ZDS as compulsory' differs in purchase of housing insurance among insured Hhs at a statistically significant level [Mann-Whitney U=988.5, z= -2.217, p= 0.027]. Although insured Hhs that perceive ZDS as compulsory seem to purchase house insurance, not all insured Hhs purchase house insurance. Indeed, purchasing house insurance among insured Hhs are also found as related to their income and education level [Pearson chi-square (4) = 9.008, p= 0.061 and Pearson chi-square (3)= 9.007, p= 0.029, respectively].

Table 6.69. General Insurance Purchase and Priority of Sources for Compensation of Losses

Spearman's rho	*ZDS Purchase*	My Own Assets and Financial Accumulation	Relatives / Friends	Bank Credit/ Loan	Priority of ZDS/DASK	Other Insurances	State Aid
Correlation Coefficient							
Insurance types (#)	Insured	-.035	-.231	.165	.079	.321(*)	-.226(*)
	Uninsured	.082	-.349	-.103	.162	.129	-.019
N							
Insurance types (#)	Insured	77	68	67	90	52	85
	Uninsured	16	19	16	16	13	18

* Correlation is significant at the 0.05 level (2-tailed).

This is also similar to purchase of Kasko for their car in addition to compulsory traffic insurance, because Kasko purchase is also found as related to Hh-Head's education but not related to Hh income level among insured Hhs [Pearson chi-square (3) = 8.604, p= 0.035; and Pearson chi-square (4)= 7.558, p= 0.109, respectively]. In addition, these Hhs that have general insurance culture do not perceive DASK as responsible for protection from disaster losses. Instead, they perceive district municipality and homeowners as responsible for protection from disaster losses (Table 6.68). Moreover, these Hhs give more priority to 'other insurances' instead of ZDS/DASK, while they do not expect State-aid (Table 6.69).

These findings indicate that some Hhs among insured Hhs have higher income and education level and they do not perceive ZDS as compulsory, as responsible for protection from financial losses and as their prior source. Although some of them perceive ZDS as compulsory, the main reason of their ZDS purchase seem to be their general insurance purchase behavior. Indeed, perceiving ZDS as compulsory seem to result to purchase additional house insurance among these Hhs. For this reason, these Hhs do not perceive State-aid and think that homeowners are responsible for protection from earthquake losses.

6.1.3.2. Realized Behavior for ZDS and Intentions

According to realized ZDS related behavior, insured Hhs are observed as more concerned with ZDS system. First, some of insured Hhs seem to purchase ZDS for their other estates in contrast to un-insured Hhs, when purchasing ZDS for other estates is related to ZDS purchase for their house, where they live significantly [Pearson chi-square (1)= 11.990, p= 0.001, Phi=0.363]. In addition, many insured Hhs told that they have searched information about ZDS, in contrast to un-insured Hhs (Table 6.70). Indeed, searching information about ZDS is related to ZDS purchase at a statistically significant level [Pearson chi-square (1) = 40.815, p= 0.000]. However, information search for ZDS differs also according to Hh-Heads' education level among insured Hhs [Mann-Whintey U = 1072.5, z= -1.983, p= 0.047].

Table 6.70. ZDS related Behavior of Households

		All Hhs			Insured Hhs			Un-insured Hhs		
		Yes	No	Total	Yes	No	Total	Yes	No	Total
ZDS Purchase for other Estates	N	29	62	91	29	42	71		20	20
	%	14.0	30.0	44.0	18.0	26.1	44.1		43.5	43.5
Search of Information on CEI	N	150	54	204	133	25	158	17	29	46
	%	72.5	26.1	98.6	82.6	15.5	98.1	37.0	63.0	100.0
Friends/Relatives	N	16	132	148	14	118	132	2	14	16
	%	7.7	63.8	71.5	8.7	73.3	82.0	4.3	30.4	34.8
Neighbours / Apartment Manager	N	4	144	148	3	129	132	1	15	16
	%	1.9	69.6	71.5	1.9	80.1	82.0	2.2	32.6	34.8
TV Advertisements	N	56	92	148	50	82	132	6	10	16
	%	27.1	44.4	71.5	31.1	50.9	82.0	13.0	21.7	34.8
News in the Media	N	67	81	148	58	74	132	9	7	16
	%	32.4	39.1	71.5	36.0	46.0	82.0	19.6	15.2	34.8
Municipality	N	11	137	148	11	121	132		16	16
	%	5.3	66.2	71.5	6.8	75.2	82.0		34.8	34.8
Insurance Companies	N	44	104	148	42	90	132	2	14	16
	%	21.3	50.2	71.5	26.1	55.9	82.0	4.3	30.4	34.8
Internet	N	4	144	148	4	128	132		16	16
	%	1.9	69.6	71.5	2.5	79.5	82.0		34.8	34.8
Daily News-Paper	N	61	121	182	54	85	139	7	36	43
	%	29.5	58.5	87.9	33.5	52.8	86.3	15.2	78.3	93.5
Information on CEI in Daily News Paper	N	19	44	63	18	38	56	1	6	7
	%	9.2	21.3	30.4	11.2	23.6	34.8	2.2	13.0	15.2

Many insured Hhs explained their information sources as 'news in media', 'daily news-paper', 'TV advertisements' and insurance companies'. However, un-insured Hhs explained their information sources only as 'news in media' and 'TV advertisements' (Table 6.70). Indeed, insured Hhs seem to read daily new-paper more than un-insured Hhs, because reading daily news-paper is related to ZDS purchase at a statistically significant level [Pearson chi-square (1) = 7.508, p= 0.006, Phi=0.203]. In addition, information source as 'TV advertisement' differs according to Hh-Heads' age among insured Hhs significantly [Mann-Whitney U = 1276.5, z= -3.082, p= 0.002]. Indeed, older Hh-Heads seem to be informed by TV-advertisements to purchase ZDS (M=53.52). Moreover, information sources as 'insurance companies', 'internet' and 'daily news-paper' differ according to education and income levels of Hhs, significantly. [1; 2; 3]. That is, more educated Hh-heads and Hhs in higher income levels seem to get information from insurance companies, internet and daily news-paper.

Table 6.71. Searched Information Type and ZDS Purchase

Information type		All Hhs			Insured Hhs			Un-insured Hhs		
		Yes	No	Total	Yes	No	Total	Yes	No	Total
Premium amount	N	86	88	174	60	78	138	26	10	36
	%	41.5	42.5	84.1	37.3	48.4	85.7	56.5	21.7	78.3
Compensation Amount	N	105	69	174	87	51	138	18	18	36
	%	50.7	33.3	84.1	54.0	31.7	85.7	39.1	39.1	78.3
Where and by whom to be used the aggregated money	N	120	54	174	102	36	138	18	18	36
	%	58.0	26.1	84.1	63.4	22.4	85.7	39.1	39.1	78.3
Purchase additional home insurance	N	24	150	174	19	119	138	5	31	36
	%	11.6	72.5	84.1	11.8	73.9	85.7	10.9	67.4	78.3
Necessity of Construction License	N	38	136	174	28	110	138	10	26	36
	%	18.4	65.7	84.1	17.4	68.3	85.7	21.7	56.5	78.3

Moreover, perceived risk differs according to 'information search behavior' among insured Hhs significantly [Mann-Whitney U=176.0, z= -2.755, p=0.006]. However, perceived probability, losses and risk as well as perceived controllability of earthquakes do not differ according to information sources of Hhs for ZDS. Likewise, perceived attributes of ZDS system do not differ according to information search and information sources of Hhs, significantly. However, perceived responsibilities for protection from losses differs among insured Hhs according to information source as 'TV advertisements' significantly [Mann-Whitney U= 400., z= -4.386, p= 0.000]. On the other hand, perceived responsibility of 'State' for post-disaster activities is found as related to information sources as 'neighbours-apartment manager', 'TV advertisements' and 'municipality', among insured Hh [Pearson chi-square (1) = 6.419, p= 0.011; Pearson chi-square (1) = 5.202, p= 0.023 and Pearson chi-square (1) = 10.645, p= 0.001, respectively].

Table 6.72. Information about Premium Amount and Household Atributes

ZDS Purchase	Searched Information for Premium amount	Average (Mean)			
		Education of Hh-Head by Years	Income Amount (Av. of Income Levels)	Satisfaction with Housing Expenditure	Satisfaction with Insurance Expenditure
Insured	Yes	8.0517	1338.1818	2.7073	2.5102
	No	8.7703	1124.6479	2.2500	2.3220
	Total	8.4545	1217.8571	2.4516	2.4074
Uninsured	Yes	7.1250	888.6364	1.8636	1.9048
	No	6.0000	1668.7500	2.6667	2.1111
	Total	6.8182	1096.6667	2.0968	1.9667

Accordingly, insured Hhs who searched information in 'municipality' and 'insurance companies' perceived 'Istanbul Metropolitan Municipality' as responsible for post-disaster activities. However, un-insured Hhs that searched information in daily news-paper perceived also Istanbul Metropolitan Municipality as responsible for post-disaster activities [Pearson chi-square (1)=4.221, p= 0.040; Pearson chi-square (1)=4.008, p= 0.045; and Pearson chi-square (1)=4.734, p= 0.030; respectively].

Finally, insured Hhs that applied for insurance companies to search information for ZDS perceive 'homeowners' as responsible for post-disaster activities [Pearson chi-square (1)=4.113, p= 0.043]. In addition, insured Hhs seem to be more concerned with 'where and by whom aggregated money in ZDS will be used' (trust) in their information search, which is related to ZDS purchase behaviour significantly [Pearson chi-square (1)=7.628, p= 0.006, Phi=0.209]. Indeed, searching information on premium amount of ZDS is inversely related to ZDS purchase significantly [Pearson chi-square (1)= 9.437, p= 0.002, Phi= -0.233]. However, these insured Hhs seem to have higher income level in average than other insured Hhs (M= 1338; and M=1124, respectively).

These Hhs seem to be more satisfied with their housing and insurance expenditures. On the other hand, un-insured Hhs are also concerned with 'compensation amount' and 'use of aggregated money', when their higher concern is seen for 'premium amount'. However, un-insured Hhs that have searched information about 'premium amount' seem to have lower income level than other un-insured Hhs (M=888; and M=1668; respectively). Un-insured Hhs that searched information about premium amount seem to be less satisfied with their housing and insurance expenditures (Table 6.71 and Table 6.72).

Table 6.73. Information about Compensation Amount and Household Attributes

ZDS purchase	Searching Information About Compensation Amount of ZDS	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)	Satisfaction with Housing Expenditures	Satisfaction with Insurance Expenditures
Insured	*Yes*	8.6265	1223.7179	2.6182	2.5373
	No	8.1633	1208.3333	2.2105	2.1951
	Total	8.4545	1217.8571	2.4516	2.4074
Uninsured	*Yes*	6.5882	942.8571	1.8571	1.9231
	No	7.0625	1231.2500	2.2941	2.0000
	Total	6.8182	1096.6667	2.0968	1.9667

Table 6.74. Information about 'Use of Aggregated Money' and Household Attributes

ZDS Purchase	Where and by whom to be used the aggregated money	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)	Satisfaction with Housing Expenditure	Satisfaction with Insurance Expenditure
Insured	*Yes*	8.5510	1176.0753	2.4328	2.4125
	No	8.1765	1335.6061	2.5000	2.3929
	Total	8.4545	1217.8571	2.4516	2.4074
Uninsured	*Yes*	7.0000	909.6154	1.8667	1.7333
	No	6.6471	1239.7059	2.3125	2.2000
	Total	6.8182	1096.6667	2.0968	1.9667

Likewise, insured Hhs that searched information about 'compensation amount' have higher education and income levels, when they are also more satisfied with their housing and insurance expenditures than other insured Hhs (Table 6.73). Indeed, satisfaction with housing expenditures differs according to searching information about compensation amount among insured Hhs significantly [Mann-Whitney U=764, z= -2.429, p= 0.015]. In contrast, un-insured Hhs that searched information about compensation amount have lower education level and lower income level, when they are also less satisfied with their housing and insurance expenditures (Table 6.73).

Table 6.75. Information about 'Use of Aggregated Money' and Perceived Earthquake Risk

ZDS Purchase	Where and by whom to be used the aggregated money	Perceived Controllability of Earthquakes	perceived probability	perceived total loss to themselves	Perceived risk
Insured	*Yes*	4.3452	3.2407	4.2131	3.9025
	No	4.4828	3.4815	4.3182	4.1364
	Total	4.3805	3.3009	4.2410	3.9660
Uninsured	*Yes*	3.6667	3.2857	3.9091	3.6250
	No	4.3636	3.2083	4.2500	3.7500
	Total	3.9615	3.2500	4.0526	3.6806

Information search for 'use of aggregated money in ZDS' and 'ZDS purchase' are found as related at statistically significant level [Pearson chi-square (1)= 7.628, p= 0.006]. Both insured and un-insured Hhs that searched out this information type seem to have higher education level. However, insured Hhs that search this information type appear to have lower income level and less satisfaction with housing expenditure. However, they seem to e more satisfied with their insurance expenditure. On the other hand, un-insured Hhs that searched out this information type have lower income level and less satisfaction with their housing and insurance expenditures other un-insured Hhs (Table 6.74). In addition, these Households, who searched this information type, seem to perceive earthquakes less controllable, when they also perceive probability of losses and earthquake risk less than other Hhs among both insured and un-insured Hhs (Table 6.75).

Table 6.76. Information about 'Use of Aggregated Money' and Perceived Attributes of ZDS

ZDS Purchase	Where and by whom to be used the aggregated money	ZDS as compulsory	ZDS as solidarity mechanism	Being confused	Trust
Insured	*Yes*	4.3636	4.0244	3.8171	3.240964
	No	4.1875	3.8077	3.7857	2.791667
	Total	4.3167	3.9722	3.8091	3.140187
Uninsured	*Yes*	3.0667	3.2857	3.1429	3.666667
	No	4.3571	3.4545	2.9231	3.000000
	Total	3.6897	3.3600	3.0370	3.333333

There is found no significant relation between information search about 'use of aggregated money' and 'trust on ZDS', i.e. 'I am sure that aggregated money will be used only for earthquakes' among both insured and un-insured Hhs. However, both insured and un-insured Hhs that searched information on 'use of aggreagated money in ZDS' have more trust on ZDS system than other Hhs. Indeed, Hhs that searched this information type perceive ZDS more compulsory and as a solidarity mechanism among insured Hhs (Table 6.76). However, insured Hhs, who searched this information type, seem to perceive DASK and homeowners more responsible for protection from earthquake losses. In contrast, un-insured Hhs who have searched this information type perceive DASK and homeowners less responsible (Table 6.77).

Table 6.77. Information about 'Use of Aggregated Money' and Perceived Responsibilities for Protection from Losses

ZDS Purchase	Where and by whom to be used the aggregated money	IMM	State	ZDS/ DASK	Homeowners
Insured	*Yes*	4.3816	4.3553	3.9189	4.0938
	No	4.3846	4.5769	3.8750	3.8000
	Total	4.3824	4.4118	3.9082	4.0112
Uninsured	*Yes*	4.3571	4.2857	3.7692	3.7143
	No	4.6364	4.4545	3.9000	4.0000
	Total	4.4800	4.3600	3.8261	3.8333

As a result, ZDS purchase is found as related with certain ZDS related behavior at statistically significant levels. These are 'ZDS purchase for other estates', 'purchase of housing insurance', 'searching information on ZDS' and searched information type as 'use of aggregated money in ZDS'.

6.1.3.3. Realized Risk Mitigation Behavior and Intentions

With respect to taking risk mitigation measures (RMMs) in the building, insured Hhs are expected to take RMMs in the building. Indeed, many insured Hhs stated that 'majority wants to take RMMs, but there are appeals'. In contrast, some insured Hhs and un-insured Hhs also explained that 'taking RMMs was never in the agenda of building management'. However, rate of un-insured Hhs, who stated that 'they had already taken RMMs in the building' is found higher than insured Hhs (Table 6.78).

n addition, almost all un-insured Hhs and many insured Hhs have declared that they have already "inspected their buildings' vulnerability". Moreover, few of insured Hhs have already 'a retrofitting project', when some of insured Hhs have already 'retrofitted bearing system of building' .There are also observed some Hhs that declared "they have already strenghtened building's foundation" (Table 6.79).

Table 6.78. Decision of Apartment Management for Taking RMMs and Realized Risk Mitigation in the Building

		Count			% within Being Insured			% of Total		
		Insured Hhs	Un-insured Hhs	Total	Insured Hhs	Un-insured Hhs	Total	Insured Hhs	Un-insured Hhs	Total
Apartment management decided to take RMMs	Yes	18	2	20	14.8	6.5	13.1	11.76	1.31	13.1
	No	104	29	133	85.2	93.5	86.9	67.97	18.95	86.9
	Total	122	31	153	100	100	100	79.74	20.26	100
Majority Doesn't Want	Yes	6	3	9	4.9	9.7	5.9	3.92	1.96	5.9
	No	116	28	144	95.1	90.3	94.1	75.82	18.3	94.1
	Total	122	31	153	100	100	100	79.74	20.26	100
Majority Wants but there are Appeals	Yes	12	1	13	9.8	3.2	8.5	7.84	0.65	8.5
	No	110	30	140	90.2	96.8	91.5	71.9	19.61	91.5
	Total	122	31	153	100	100	100	79.74	20.26	100
This issue was never in the Agenda	Yes	86	27	113	70.5	87.1	73.9	56.21	17.65	73.9
	No	36	4	40	29.5	12.9	26.1	23.53	2.61	26.1
	Total	122	31	153	100	100	100	79.74	20.26	100
Already Taken RMMs in the building	Yes	36	11	47	29	31.4	29.6	22.6	6.9	29.6
	No	88	24	112	71	68.6	70.4	55.3	15.1	70.4
	Total	124	35	159	100	100	100	78	22	100

Table 6.79. Type of Realized Risk Mitigation in the Building

		Count			% within Being Insured			% of Total		
		Insured Hhs	Un-insured Hhs	Total	Insured Hhs	Un-insured Hhs	Total	Insured Hhs	Un-insured Hhs	Total
inspection of building's vulnerability	Yes	27	13	40	67.5	100	75.5	50.9	24.5	75.5
	No	13	0	13	32.5	0	24.5	24.5	0	24.5
	Total	40	13	53	100	100	100	75.5	24.5	100
already had a retrofitting project	Yes	1	0	1	2.6	0	2	2	0	2
	No	37	13	50	97.4	100	98	72.5	25.5	98
	Total	38	13	51	100	100	100	74.5	25.5	100
retrofitting bearing system	Yes	7	0	7	18.4	0	13.7	13.7	0	13.7
	No	31	13	44	81.6	100	86.3	60.8	25.5	86.3
	Total	38	13	51	100	100	100	74.5	25.5	100
taken a retrofitting certificate	Yes	1	0	1	2.6	0	2	2	0	2
	No	37	13	50	97.4	100	98	72.5	25.5	98
	Total	38	13	51	100	100	100	74.5	25.5	100
strenghten foundation and basement	Yes	8	0	8	21.1	0	15.7	15.7	0	15.7
	No	30	13	43	78.9	100	84.3	58.8	25.5	84.3
	Total	38	13	51	100	100	100	74.5	25.5	100

Table 6.80. Inspection of Building's Vulnerability and Perceived Earthquake Risk

ZDS Purchase	Inspection of building's vulnerability	Perceived Total Risk in Building	perceived probability	perceived total loss to themselves	Perceived risk
Insured	*Yes*	3.9306	3.3077	4.2031	3.8516
	No	3.9375	3.2727	4.2857	3.7857
Uninsured	*Yes*	3.7222	3.3636	4.0417	3.6875
	No	3.8452	3.3261	4.1528	3.7578

Among these measures, only **"inspection of buildings' vulnerability"** is found as related with ZDS purchase at a statistically significant level, but inversely [Pearson chi-square (1) = 5.598, p= 0.018, Phi= -0.325, p= 0.018]. This finding can verify why un-insured Hhs perceive less lossses to themselves and why they feel themselves outside solidarity system of ZDS. Indeed, there is observed no difference in perceived total risk among insured Hhs according to their inspection of buildings' vulnerability. In contrast, un-insured Hhs that have inspected their buildings perceive total risk in building less than other un-insured Hhs. Although having inspection seem to cause declining ZDS purchase among un-insured Hhs, these Hhs that have inspection in building seem to perceive more losses to themselves (Table 6.80).

Table 6.81. Reasons of Taking Necessary Measures

		Count			% within Being Insured			% of Total		
		Insured Hhs	Un-insured Hhs	Total	Insured Hhs	Un-insured Hhs	Total	Insured Hhs	Un-insured Hhs	Total
High Probability of Earthquake	Yes	36	6	42	75	66.7	73.7	63.2	10.5	73.7
	No	12	3	15	25	33.3	26.3	21.1	5.3	26.3
	Total	48	9	57	100	100	100	84.2	15.8	100
Protection and Increase of Housing Value	Yes	8	0	8	17.4	0	14.5	14.5	0	14.5
	No	38	9	47	82.6	100	85.5	69.1	16.4	85.5
	Total	46	9	55	100	100	100	83.6	16.4	100
Unsafe Ground of the Building	Yes	9	2	11	19.6	22.2	20	16.4	3.6	20
	No	37	7	44	80.4	77.8	80	67.3	12.7	80
	Total	46	9	55	100	100	100	83.6	16.4	100
Unsafe Buildings	Yes	8	0	8	17.4	0	14.5	14.5	0	14.5
	No	38	9	47	82.6	100	85.5	69.1	16.4	85.5
	Total	46	9	55	100	100	100	83.6	16.4	100
Explanations of Scientists	Yes	12	5	17	26.1	50	30.4	21.4	8.9	30.4
	No	34	5	39	73.9	50	69.6	60.7	8.9	69.6
	Total	46	10	56	100	100	100	82.1	17.9	100

In addition, both insured and un-insured Hhs have declared the main reason of taking mitigation measures as 'high probability' of earthquake', which is followed by 'explanations of scientists'. Although insured Hhs declared that 'un-safety' of building and 'building ground' are other reasons, un-insured Hhs seem to perceive the structure of their building safer than the ground of building. However, protection and increase in the house value seems to be not so essential in comparison with high earthquake risk (Table 6.81).

On the other hand, Hhs were also asked for the 'inspection of building' in two other questions. Accordingly, among Hhs that inspected their building, insured Hhs seem to perceive their building safer than un-insured Hhs. Despite, insured Hhs purchase ZDS, whereas un-insured Hhs decline to purchase ZDS. In other words, after inspection of the building, perceiving the building safer seems to not change ZDS purchase behavior of insured Hhs. In contrast, perceiving the building less safer seems to cause not purchasing ZDS among un-insured Hhs (Table 6.82).

Table 6.82. Inspection of Building, Perceived Safety of Building and Perceived Controllability of Losses

ZDS Purchase	Inspection of the building's vulnerability	There is any inspection in the building.	The building is safe according to the inspections.	Taking the required damage reduction measures has great benefits.	When the necessary precautions are taken, this building can be made safe against an earthquake.	It is possible to take measures greatly with the scientific and technical methods against earthquakes
Insured	*Yes*	2.0000	4.0400	4.0741	2.8519	4.3704
	No	2.9167	3.5000	4.1000	3.8000	4.7500
Uninsured	*Yes*	2.8182	3.7000	4.2500	3.6667	3.9000
	No	3.0500	3.2500	3.9500	3.6667	3.9583

In addition, insured Hhs that inspected their buildings do not think that taking RMMs has great benefits and taking RMMs can strenghten the building, because of perceiving the building safer. In contrast, insured Hhs that did not inspected their buildings perceive more benefits from taking RMMs. They also think that taking RMMs can made the building safer, when they also agree with 'the controllability of earthquakes with scientific and technical measures' more than other insured Hhs. This can be because of their perceiving building not so safe. On the other hand, un-insured Hhs that inspected their building perceive their building un-safer believe the benefit from 'taking RMMs more than other insured and un-insured Hhs. This difference can arise from perceiving building not so safe (Table 6.82).

Table 6.83. Inspection in the Building, Beliefs for RMMs and Perceived Attributes of ZDS

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS as Compulsory	ZDS as Solidarity Mechanism	Being Confused	Trust
There is not any inspection in the building.	Insured	-.135	.138	.037	-.157
	Uninsured	-.127	-.305	-.025	-.081
The building is safe according to the inspections.	Insured	.227(*)	-.143	-.012	-.061
	Uninsured	-.066	.077	-.059	.467(*)
When the necessary precautions are taken, the building can be made safe against an earthquake.	Insured	-.065	.049	-.174	-.132
	Uninsured	.249	.322	-.140	-.018
Taking the required damage reduction measures has great benefits.	Insured	.013	-.128	.051	-.067
	Uninsured	.327	.436(*)	-.115	-.217
The damage in the building depends on coincidences.	Insured	.255(*)	.084	.247(*)	.029
	Uninsured	-.224	-.146	.076	.005

* Correlation is significant at the 0.05 level (2-tailed). Insured :Listwise N = 89 and Uninsured :Listwise N = 22

ZDS purchase behavior of insured Hhs that have inspected their buildings seems to be related to their perception of ZDS purchase compulsory. Although they perceive their building safer, they continue to purchase ZDS. Indeed, perception of ZDS as compulsory seems to create perception of damage in the building as dependent on coincidences. Therefore, although they take RMMs they do not decline purchasing ZDS. On the other hand, un-insured Hhs that think their building is safe according to inspections trust on ZDS system. In addition, un-insured Hhs that perceive ZDS as a social solidarity mechanism believe that taking required RMMs has great benefits. In other words, their perception of solidarity seems to involved with taking RMMs instead of sharing the losses (Table 6.83).

As mentioned in risk perception section, insured Hhs also perceive more loss of life to themselves and their family and more losses to monetary value in their houses. In the same way, insured Hhs think that taking RMMs has more benefits than costs. However, their perceived benefit seems to be less involved with perceived monetary benefits, because worry about saving lives in the family seems to have more influence in taking RMMs among insured Hhs. In contrast, taking RMMs is perceived by un-insured Hhs as more profitable investments for future (Table 6.84). This difference can arise from their lower perception of losses to themselves.

Table 6.84. Reasons of Taking RMMs in the Building and Perceived Attributes of RMMs

		Count			% within Being Insured			% of Total		
		Insured Hhs	Un-insured Hhs	Total	Insured Hhs	Un-insured Hhs	Total	Insured Hhs	Un-insured Hhs	Total
RMMs have more benefit than costs	Yes	5	0	5	10.9	0	9.1	9.1	0	9.1
	No	41	9	50	89.1	100	90.9	74.5	16.4	90.9
	Total	46	9	55	100	100	100	83.6	16.4	100
RMMs are profitable investments for the future	Yes	8	2	10	17.4	22.2	18.2	14.5	3.6	18.2
	No	38	7	45	82.6	77.8	81.8	69.1	12.7	81.8
	Total	46	9	55	100	100	100	83.6	16.4	100
Encouragement of Neighbors/ Building Manager	Yes	2	0	2	4.3	0	3.6	3.6	0	3.6
	No	44	9	53	95.7	100	96.4	80	16.4	96.4
	Total	46	9	55	100	100	100	83.6	16.4	100
Encouragement of Friends/Relatives	No	46	9	55	100	100	100	83.6	16.4	100
	Total	46	9	55	100	100	100	83.6	16.4	100
Worry about Saving Lives in the Family	Yes	23	3	26	47.9	33.3	45.6	40.4	5.3	45.6
	No	25	6	31	52.1	66.7	54.4	43.9	10.5	54.4
	Total	48	9	57	100	100	100	84.2	15.8	100
Finding Already Taken RMMs Insufficient	Yes	16	6	22	26.7	42.9	29.7	21.6	8.1	29.7
	No	44	8	52	73.3	57.1	70.3	59.5	10.8	70.3
	Total	60	14	74	100	100	100	81.1	18.9	100

Un-insureds Hhs seem to find already taken measures more insufficient than insured Hhs. This difference could arise from their perception of the buildings un-safer, in contrast to insured Hhs. However, both insured and un-insured Hhs seem to perceive their building un-safe, when they also perceive taking RMMs is necessary. In addition, both insured and un-insured Hhs seem to be willing to take RMMs, instead of moving away. Despite, insured Hhs appear to have more intention to take RMMs, because they declared that they already have a retrofitting decision. In addition, insured Hhs seem to be more willing to take RMMs even their neighbours are not willing.

On the other hand, although un-insured Hhs also appear to agree on investigation and retrofitting the building, they seem to be reluctant to take RMMs in the case of their neighbour do not agree. On the other hand, the main obstacle for taking RMMs among insured Hhs seems to be their financial difficulty, because they declared that they could not afford to implement their retrofitting project. Although both insured and un-insured Hhs perceive taking RMMs as expensive, more insured Hhs declared that they do not know the costs of RMMs. Likewise, more insured Hhs explained that they do not have technical knowledge about the necessary measures. However, insured Hhs seem to be more willing to spend their time to deal with RMMs than un-insured Hhs (Table 6.85).

Table 6.85. Intentions for Taking RMMs in the Building

	All Hhs			Insured Hhs			Un-insured Hhs		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Neighbours do not support retrofitting.	108	3.2685	1.13242	80	3.2625	1.18795	28	3.2857	0.9759
We have a retrofitting decision, but we couldn't afford.	108	3.4537	1.19488	79	3.557	1.21684	29	3.1724	1.10418
The building is safe. No need to take any measure.	109	2.7706	1.13556	81	2.8148	1.14139	28	2.6429	1.12922
I will agree on investigation and doing project.	104	4.0481	0.81705	77	4.0649	0.81657	27	4	0.83205
I want to take measures at the building, even the neighbours do not want.	106	3.9623	0.92504	79	4.0633	0.91065	27	3.6667	0.91987
The earthquake possibility is low.	105	2.1143	0.92315	77	2.1429	0.95579	28	2.0357	0.83808
My home wil not be damaged.	108	2.3981	1.04067	80	2.45	1.04215	28	2.25	1.04083
I intend to move.	106	2.5377	1.13954	78	2.6154	1.15355	28	2.3214	1.09048
I do not know cost of these measures.	110	3.7909	1.08446	81	3.9383	1.00431	29	3.3793	1.20753
RMMs are expensive.	107	3.8692	0.94254	78	3.8846	0.9532	29	3.8276	0.92848
Few people among my friends and relatives have already taken.	109	3.7982	1.08679	81	3.8025	1.0888	28	3.7857	1.10075
I do not know what I can do.	104	3.5673	1.09513	76	3.5658	1.09952	28	3.5714	1.10315
I haven't had time.	95	2.9895	1.1623	69	2.942	1.16169	26	3.1154	1.17735
I do not have knowledge about necessary measures.	107	3.5421	1.23838	79	3.6582	1.20773	28	3.2143	1.28689

6.1.3.4. Realized Emergency Preparedness Behavior

In general, insured Hhs have already taken Emergency Preparedness Measures (EPMs) more than un-insured Hhs. This difference is observed partciularly in EPMs such as 'preparing emergency aid-kit', 'storing hazardous materials safely', 'fastening big furnitures', 'stockpiling food and water', 'learning how to behave during disasters', and 'preparing an emergency meeting plan' (Table 6.86). In addition, 'stockpiling food and water' is found significantly related to ZDS purchase behavior [Pearson chi-square (1) = 4.896, p= 0.014]. In addition, 'fasten big furnitures', 'buying fire extinguisher', 'preparing emergency aid-kit', 'buying specific tools', 'participating first-aid trainings', 'learning how to behave during earthquakes' are found as related to 'perceived attribute of ZDS as compulsory' at statistically significant levels among insured Hhs. In addition, perceiving ZDS as compulsory is also related to take some of these measures significantly: 'buying fire extinguisher', 'storing hazardous materials safely' and 'preparing emergency aid-kit'.

Table 6.86.Frequency Table of Realized EMPs Behaviour

		All Hhs			Insured Hhs			Un-insured Hhs		
		Yes	No	Total	Yes	No	Total	Yes	No	Total
Fasten big furniture.	N	36	100	136	31	75	106	5	25	30
	%	17.4	48.3	65.7	19.3	46.6	65.8	10.9	54.3	65.2
Buy fire extinguisher.	N	18	117	135	14	91	105	4	26	30
	%	8.7	56.5	65.2	8.7	56.5	65.2	8.7	56.5	65.2
Store hazardous materials safely.	N	42	84	126	33	64	97	9	20	29
	%	20.3	40.6	60.9	20.5	39.8	60.2	19.6	43.5	63.0
Prepare emergency aid kit	N	46	85	131	40	61	101	6	24	30
	%	22.2	41.1	63.3	24.8	37.9	62.7	13.0	52.2	65.2
Stockpile food and water	N	29	96	125	27	68	95	2	28	30
	%	14.0	46.4	60.4	16.8	42.2	59.0	4.3	60.9	65.2
Buy specific tools	N	14	109	123	13	81	94	1	28	29
	%	6.8	52.7	59.4	8.1	50.3	58.4	2.2	60.9	63.0
Participating first-aid training	N	21	104	125	16	81	97	5	23	28
	%	10.1	50.2	60.4	9.9	50.3	60.2	10.9	50.0	60.9
Learn how to behave during an earthquake to rescue myself and my kin.	N	31	100	131	27	74	101	4	26	30
	%	15.0	48.3	63.3	16.8	46.0	62.7	8.7	56.5	65.2
Learn the necessities to work during rescue	N	15	114	129	11	88	99	4	26	30
	%	7.2	55.1	62.3	6.8	54.7	61.5	8.7	56.5	65.2
Prepare an emergency meeting plan with family.	N	28	97	125	25	71	96	3	26	29
	%	13.5	46.9	60.4	15.5	44.1	59.6	6.5	56.5	63.0
Participate to trainings for disasters in neighbourhood.	N	8	116	124	7	88	95	1	28	29
	%	3.9	56.0	59.9	4.3	54.7	59.0	2.2	60.9	63.0

6.1.4. Which Factor Significantly Influence ZDS Purchase Behavior?

To find out the most influential factors on ZDS purchase behavior, multivariate analyses are performed in terms of the factors that are found as related to ZDS purchase at statistically significant levels.

6.1.4.1. Methodology of Multivariate Analysis

Because the dependent variable, i.e. ZDS purchase, is a categorical variable with two groups, i.e. 'being insured' and 'being not insured', there could be applied 'Discriminant Function Analysis' and 'Binomial Logistic Regression' to find out the most influential factors in ZDS purchase. However, the assumptions of Discriminant Function Analysis such as 'univariate and multi-variate normal distribution' and 'linearity' could not be met with the database used in this study. In addition, Discriminant Function Analysis requires 'continuous' independent variable, whereas the influential independent variables that are obtained in previous discussion until this step include also categorical variables. On the other hand, Binomial Logistic Regression does not necessitate univariate and normal distribution and linearity assumptions, when the categorical and continuous independent variables can also be included into analysis. For these reasons, Binomial Logistic Regression is applied in two steps as to find out:

1) most influential 'attributes and perceptions of Households'; and
2) most influential 'behavior and intentions of Households', in ZDS purchase behavior.

The dependent variable, i.e. ZDS purchase, is recoded again as assigning "2" to "being insured" and "1" to "being not insured" so that computer program (SPSS) coded 'ZDS Purchase' as a dummy variable by assigning '0' to 'being not insured' and '1' to 'being insured'. Therefore, positive sign of independent variables (i.e. their B coefficients) can be commented as 'direct influence on being insured', whereas negative sign of independent variables can be commented as 'inverse influence on being insured'. Before, running Binomial Logistic Regression, the relationships between dependent variable, i.e. ZDS purchase, and independent variables are eliminated with Chi-square analysis and Cramer's V, which provides to estimate the effect of independent variable on dependent variable. Despite, significance values that are below 0.20 ($p <= 0.20$) were analyzed through Binomial Logistic Regression for independent variables in each sub-group. Further steps that are followed in analysis are explained in following sections.

6.1.4.2. Relationship of ZDS Purchase with 'Attributes and Perceptions' of Households

In the first section, Binomial Logistic Regression is performed for the variables in attribute and perception groups in several steps: In the first step, variables in each group that have significance value below 0.20, are included into binomial logistic regression, individually. Then, some of these variables that have no effect on ZDS purchase are eliminated, while only significant variables are obtained from each group. On the other hand, 'satisfaction with insurance', which is found significant for ZDS purchase, is decided to be included into group 6, i.e. 'general risk aversion' group. In the second step, remained significant variables from each group are conducted with Binomial Logistic Regression together in terms of 'forward wald' and 'backward wald' methods. Therefore, from variables that infuence each other, i.e. have interaction effect on ZDS purchase, one variable that have more influence on ZDS purchase is selected, whereas the other is eliminated. Remaining eight variables from each group were:

Group 1: Hh-Head's education (v1_3) and Hh income level (v3)

Group 2: Number of existing commercial usages in the building (v7_6) and 'House rental value' (v6_4)

Group 3: Perceived controllability of earthquakes ('It is possible to take scientific and technical measures against earthquakes.' (v36_5))

Group 4: Perception of compulsory implementation of ZDS (Everyone must purchase ZDS (v28_1)); perceived responsibilities for post-disaster activies (ZDS/DASK (v48_9)) and perceived priority of sources for compensation of losses (ZDS/DASK (v24_4))

Group 5: One Egalitarian World-view: World could be a more peaceful place if its wealth were divided more equally among nations' (v50_3_4)

In the third step, these eight variables are conducted into binomial regression together in terms of 'forward wald' method. Two variables are obtained in the model as 'perception of ZDS as compulsory' (v28_1) and 'perceived responsibility of ZDS for post-disaster process' (v48_9). In this model, correct classification rate is found 60% for un-insured Hhs, 97% for insured Hhs and 80.6% for all Hhs. 'Cox and Snell R square' and 'Nagelkerke R square' are estimated as 0.30 and 0.371, respectively (Table 6.87). In the fourth step, to undestand the interaction effects of remaining eight variables on ZDS purchase, two of them are conducted to binomial logistic regression in each time, in terms of 'forward wald' method.

Table 6.87. Variables in the Equation in the Third Step of Analyses

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	v28_1	1.264	.409	9.546	1	.002	3.540	1.588	7.892
	Constant	-3.410	1.554	4.818	1	.028	.033		
Step 2[b]	v28_1	1.634	.553	8.733	1	.003	5.126	1.734	15.151
	v48_9(1)	2.758	1.179	5.471	1	.019	15.764	1.563	158.943
	Constant	-6.573	2.617	6.309	1	.012	.001		

a. Variable(s) entered on step 1: v28_1.

b. Variable(s) entered on step 2: v48_9.

In the fifth step, the eight variables and their interaction effects are conducted with binomial regression in terms of 'forward wald' and 'backward wald' methods. As a result of the 'forward wald' method, (1) 'perception of ZDS as compulsory' and (2) interaction effect of 'perception of ZDS as responsible for compensation of losses' and 'egalitarian socio-cultural world-view' are found as most significant predictors of ZDS purchase. In this model, 'Cox and Snell R Square' and 'Nagelkerke R Square' are found as 0.230 and 0.371, respectively (-2 Log Likelihood= 28.926), when correct classification rate is estimated as 95.2% for insured Hhs, 60% for uninsured Hhs and 88.7% for all Hhs (Table 6.88).

Table 6.88. Variables in the Equation of Forward Method in the Fifth Step

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	v28_1	1.264	.409	9.546	1	.002	3.540	1.588	7.892
	Constant	-3.410	1.554	4.818	1	.028	.033		
Step 2[b]	v28_1	1.595	.528	9.118	1	.003	4.930	1.750	13.885
	v48_9(1) by v50_3_4	.701	.295	5.658	1	.017	2.016	1.131	3.593
	Constant	-6.352	2.436	6.802	1	.009	.002		

a. Variable(s) entered on step 1: v28_1.

b. Variable(s) entered on step 2: v48_9 * v50_3_4 .

On the other hand, 'backward wald' method, predictors that are found significant through 18 step are observed as (1) the interaction effect of 'perception of ZDS as compulsory' and 'perception of ZDS as prior source for loss compensation' as well as (2) the interaction effect of 'perception of ZDS as responsible for post-disaster process' and 'egalitarian socio-cultural world-view'. In this model, 'Cox and Snell R Saure' and 'Nagelkerke R Square' are found as 0.343 and 0.553', respectively (-2 Log Likelihood=29.058). Correct classification rate is found 97.7% for insured Hhs, 40% for un-insured Hhs and 86.8% for all Hhs (Table 6.89).

Table 6.89. Variables in the Equation of Backward Method in the Fifth Step

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 16(a)	v7_6	-1.468	.789	3.456	1	.063	.230	.049	1.083
	v50_3_4	-.851	.608	1.960	1	.162	.427	.130	1.406
	v24_4 by v28_1	.263	.107	6.037	1	.014	1.301	1.055	1.604
	v48_9(1) by v50_3_4	1.058	.493	4.607	1	.032	2.880	1.096	7.568
	Constant	.320	3.146	.010	1	.919	1.377		
Step 17(a)	v7_6	-.870	.574	2.295	1	.130	.419	.136	1.291
	v24_4 by v28_1	.200	.079	6.336	1	.012	1.221	1.045	1.426
	v48_9(1) by v50_3_4	.736	.377	3.803	1	.051	2.088	.996	4.374
	Constant	-2.316	2.459	.887	1	.346	.099		
Step 18(a)	v24_4 by v28_1	.222	.082	7.278	1	.007	1.249	1.063	1.467
	v48_9(1) by v50_3_4	.920	.389	5.593	1	.018	2.510	1.171	5.381
	Constant	-4.883	2.208	4.889	1	.027	.008		

a Variable(s) entered on step 1: v1_3_yrs, v7_6, v6_4gr3, v36_5, v28_1, v48_9, v24_4, v50_3_4, v1_3_yrs * v6_4gr3 , v1_3_yrs * v50_3_4 , v36_5 * v7_6 , v28_1 * v7_6 , v48_9 * v7_6 , v28_1 * v36_5 , v36_5 * v48_9 , v24_4 * v36_5 , v36_5 * v50_3_4 , v24_4 * v28_1 , v48_9 * v50_3_4 .

As a result of these analyses, 'perception of ZDS as compulsory' and 'perceived responsibility of ZDS for post-disaster activities' are observed as main predictors of ZDS purchase, when other variables has influence on these perceptions. According to the interactions of variables in the fourth step, 'Hh-Head's education' has interaction effect on ZDS purchase with 'house rental value' and 'egalitarian socio-cultural world-view', which has interaction effect with 'perceived controllability of earthquakes' and 'perceived responsibility of ZDS for post-disaster process'. 'Perceived controllability of earthquakes' has also interaction effect with 'perception of compulsory implementation of ZDS', 'perceived responsibility of ZDS for post-disaster process' and 'perceived priority of ZDS as source for financial compensation of earthquake losses'. In addition, 'perceived compulsory implementation of ZDS' has interaction effect with 'perceived priority of ZDS for financial compensation'. Finally, 'number of commercial usages in the building' has interaction effect with 'perceived controllability of earthquakes', 'perception of ZDS as compulsory' and 'perception of ZDS as prior source of financial compensation of losses'.

6.1.4.3. Relationship of ZDS Purchase with 'Realized Behavior and Intentions' of Households

Same steps that are are followed in the previous section are implemented to conduct Binomial Logistic Regression for ZDS purchase with 'behavior-intention' groups. Firstly, the variables of 'behavior-intention groups' that have significance value below 0.20 are conducted with Binomial Logistic Regression for ZDS purchase individually. However, many variables are obtained in Group 6 and 7 as significant. To reduce the number of these variables, they are conducted again with Binomial Logistic Regression in the second step until obtaining one variable from each group that are significant for ZDS purchase as:

Group 6: 'purchase of house insurance' (v19_5)
Group 7: 'search of information on ZDS' (v15_1)
Group 8: 'not knowing cost of RMMs' (v42B1_9)
Group 9: 'stockpiling food and water' (v42C_5)

In the third step, the interaction of these variables are searched out in terms of conducting pair of variables and their interaction into regression through 'forward wald method'. After obtaining individual effects of variables to each other, all these variables and significant interactions between them are regressed together in fourth step.

Table 6.90. Variables in the Equation in Fourth Step through Forward Wald Method

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	v15_1(1) by v42B1_9	.896	.215	17.368	1	.000	2.449	1.607	3.733
	Constant	-.803	.521	2.371	1	.124	.448		
Step 2[b]	v19_5(1)	2.240	1.186	3.565	1	.059	9.392	.918	96.048
	v15_1(1) by v42B1_9	.864	.234	13.583	1	.000	2.373	1.499	3.758
	Constant	-1.211	.603	4.030	1	.045	.298		

a. Variable(s) entered on step 1: v15_1 * v42B1_9 .

b. Variable(s) entered on step 2: v19_5.

According to model summary, 'Cox and Snell R square' and Nagelkerke R Square' are found as 0.485 and 0.557, respectively (-2 Log Likelihood: 41.268), when overall correct classification rate is found as 88.4%. As a result, 'purchase of house insurance' and 'the interaction effect of 'search of information for ZDS' and 'no knowledge on RMMs' are found as significant predictors of ZDS purchase among the 'behavior-intention' groups (Table 6.90). In fifth step, to understand the interaction between 'search of information' and 'having no knowledge on RMMS', the latter variable is used as a categorical variable in the next model. However, in the second model, only 'purchase of house insurance' and 'search of information for ZDS' are found as significant predictors of ZDs purchase behavior. Using the 'forward wald' method, 'Cox and Snell R square' and 'Nagelkerke R square' values of this second model are estimated as 0.331 and 0.510, respectively (-2 Log Likelihood: 44.511), when overall correct classification rate is found as 87% (Table 6.91).

As a result, ZDS purchase behavior is found as involved with 'House insurance purchase behavior of Hhs' and their 'search of information about ZDS'. On the other hand, the interaction is found in the 'strongly disagree' category of 'having no knowledge on RMMS'. That is, households, who have searched information, also claimed that they have knowledge on RMMs, when this interaction is influential on ZDS purchase. Despite, 'finding RMMs expensive' are not influential, because there is found no relationship with ZDS purchase. In other words, 'having knowledge about cost of RMMS' and 'finding RMMs expensive' do not influence ZDS purchase behavior.

Table 6.91. Variables in the Equation in Fifth Step through Forward Wald Method

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	v15_1(1)	3.219	.755	18.177	1	.000	25.000	5.692	109.795
	Constant	-.916	.592	2.399	1	.121	.400		
Step 2[b]	v15_1(1)	3.002	.810	13.739	1	.000	20.130	4.115	98.467
	v19_5(1)	2.322	1.166	3.966	1	.046	10.199	1.037	100.281
	Constant	-1.317	.674	3.816	1	.051	.268		

a. Variable(s) entered on step 1: v15_1.

b. Variable(s) entered on step 2: v19_5.

6.2. WHAT ARE THE TENDENCIES OF HOMEOWNERS TO POLICY OPTIONS?

This section attempts to find out tendencies of Households for several policy options to implement ZDS in a suitable way. Households are evaluated according to their current ZDS purchase behavior. In addition, tendencies of Households for different policy options are also investigated in terms of their relationships. Finally, the differences in policy preferences are searched out through Hh attributes and perceptions.

6.2.1. Policies involved with Regulation of ZDS

6.2.1.1. Implementing ZDS As Compulsory with Enforcements

Most of insured Hhs think that legislation of ZDS should be approved in Turkish Parliament, in contrast to un-insured Hhs (80.9% and 31%, respectively). Indeed, un-insured Hhs seem to have no opinion on the approval of ZDS system, because most of them have declared that they do not know, in contrast to insured Hhs (47.6%a dn 13.2%, respectively). In addition, agreement of Hhs with passing legislation of ZDS in Turkish Parliament differs according to ZDS purchase significantly [Pearson chi-square (2) = 37.469, p= 0.000]. Likewise, insured Hhs evaluated the policy options involved with "compulsory" purchase of ZDS more than un-insured Hhs, when these differences are found statistically significant. Accordingly, insured Hhs agree with 'there should be enacted an earthquake insurance law that include effective punishments', while un-insured Hhs tend to disagree with such a compulsory implementation of ZDS (Table 6.92).

Table 5.92. Policy Options to Implement ZDS Compulsory According to ZDS Purchase Behaviour

	ZDS Purchase								
	Insured Hhs			Uninsured Hhs			Difference		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
There should be enacted an "earthquake insurance law" that include effective punishments.	3.4167	120	1.34466	2.6316	38	1.21746	1532	-3.115	0.002
To oblige ZDS, the people without insurance should be imposed effective punishments.	3.7273	121	1.31022	2.9487	39	1.37551	1620	-3.034	0.002
To prepare the society against earthquake, ZDS should be compulsory.	4.0574	122	1.07025	3.1944	36	1.28329	1314.5	-3.845	0.000
ZDS should be compulsory for the buildings instead of the housing units in the buildings.	4.1500	120	1.00126	3.6857	35	1.02244	1508	-2.695	0.007
There should be monetary punishment for uninsureds.	3.0242	124	1.34021	2.2941	34	1.36025	1452.5	-2.842	0.004
There should be imprisoning for uninsureds.	2.3636	121	1.29099	2.1212	33	1.16613	1798	-0.908	0.364

Similarly, insured Hhs agree with the sentence ‘to oblige ZDS, people without insurance should be imposed effective punishments’ in contrast to un-insured Hhs. Insured Hhs also tend to strongly agree with ‘preparing society against earthquakes necessitates making ZDS compulsory’, while un-insured Hhs tend to be uncertain. In the same way, insured Hhs agree with ‘ZDS should be compulsory for the buildings instead of housing units in buildings’ more than un-insured Hhs. Despite, this policy option has highest score among un-insured Hhs. In addition, insured Hhs think that ‘monetary punishment should be applied for un-insured Hhs’, whereas un-insured Hhs disagree with monetary punishments. In addition, both insured and un-insured Hhs think that ‘imprisoning is not necessary for Hhs that do not purchase ZDS’ (Table 6.92).

On the other hand, both insured and un-insured Hhs that agreed with ‘the implementation of ZDS as compulsory with effective punishments’ seem to also agree with enforcing ZDS purchase through ‘monetary punishments’ and ‘imprisoning’. Despite, agreement of un-insured Hhs with ‘ZDS should be compulsory for buildings instead of housing units in buildings’ is not related to ‘effective punishments, monetary punishments and imprisoning’. That is, un-insured Hhs seem to disagree with punishments, if ZDS purchase is made compulsory for buildings (Table 6.93).

Table 6.93. Correlations between Policy Options for Implementing ZDS As Compulsory

Spearman's rho Correlation Coefficient	ZDS Purchase	1	2	3	4	5	6
1) There should be enacted an "earthquake insurance law" that include effective punishments.	Insured	1.000					
	Uninsured	1.000					
2) To oblige the earthquake insurance, the people without insurance should be imposed effective punishments.	Insured	.794(**)	1.000				
	Uninsured	.689(**)	1.000				
3) To prepare the society against earthquake, earthquake insurance should be obligatory.	Insured	.595(**)	.620(**)	1.000			
	Uninsured	.596(**)	.551(**)	1.000			
4) Earthquake insurance should be compulsory for the buildings instead of the housing units in the buildings.	Insured	.455(**)	.447(**)	.619(**)	1.000		
	Uninsured	.380(*)	.276	.499(**)	1.000		
5) There should be monetary punishment for uninsureds.	Insured	.631(**)	.712(**)	.507(**)	.375(**)	1.000	
	Uninsured	.738(**)	.561(**)	.556(**)	.089	1.000	
6) There should be imprisoning for uninsureds.	Insured	.450(**)	.412(**)	.426(**)	.269(**)	.667(**)	1.000
	Uninsured	.658(**)	.474(**)	.456(**)	-.065	.930(**)	1.000

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 105 and Uninsured :Listwise N = 32

Table 6.94. Compulsory Policy Options and Socio- Economic Attributes of Hhs

Spearman's rho	ZDS Purchase	To prepare the society against earthquake, ZDS should be compulsory.	ZDS should be compulsory for buildings instead of housing units.	If ZDS is not made compulsory, nobody will buy ZDS and everybody will expect State aid.	State shouldn't assist for housing to the uninsureds.
Correlation Coefficient					
Income Amount (Av. of Income Levels)	Insured	-.230(*)	-.196(*)	-.201(*)	-.194(*)
	Uninsured	-.219	.198	-.239	-.302
N					
Income Amount (Av. of Income Levels)	Insured	113	111	110	108
	Uninsured	32	31	33	30

* Correlation is significant at the 0.05 level (2-tailed).

Socio-Economic Attributes of Households: The tendency of Hhs to compulsory purchase policy option could be influenced by their socio-economic attributes. Indeed, Hh income level is found as inversely related to 'agreement with compulsory' implementation of ZDS among both insured and un-insured Hhs. Indeed, insured Hhs in middle and lower income levels agreed with compulsory purchase policy option for ZDS more than other insured Hhs (Table 6.94). Particularly differences among insured Hhs according to income level is statistically significant for two statements as "to prepare the society against earthquake, ZDS should be compulsory" and "ZDS should be compulsory for buildings instead of housing units", [F (4, 108)=3.021, p= 0.021 and F(4, 106)= 2.491, p= 0.048]. Linearity of these differences also verify that 'willingness for compulsory implementation of ZDS'

increases, whereas income level of insured Hhs decreases [F (1, 108)=8.548, p= 0.004 and F(1, 106)= 4.754, p= 0.031].

Table 6.95. Tendencies for Compulsory Implementation of ZDS according to Hh Income Levels

ZDS Purchase	Income Level	To prepare the society against earthquake, ZDS should be compulsory.	ZDS should be compulsory for buildings instead of housing units.	If ZDS is not made compulsory, nobody will buy ZDS and everybody will expect State aid.	State shouldn't assist for housing to the un-insureds.
Insured	1.00 > 2000 YTL	3.2143	3.5385	3.6923	3.2308
	2.00 2000-1000 YTL	4.0323	4.2903	4.1290	3.0357
	3.00 999-751 YTL	4.0667	3.9667	4.1481	3.5172
	4.00 750-500 YTL	4.3810	4.3810	4.5000	3.2632
	5.00 > 499 YTL	4.3529	4.5000	4.5263	3.9474
	Total	4.0531	4.1622	4.2182	3.3889
Uninsured	1.00 > 2000 YTL	1.7500	4.2500	2.7500	1.0000
	2.00 2000-1000 YTL	3.6000	3.5000	3.6000	2.6000
	3.00 999-751 YTL	3.4286	3.8571	3.8571	3.3333
	4.00 750-500 YTL	3.6000	3.6000	4.0000	3.4444
	5.00 > 499 YTL	3.3750	3.3750	4.0000	2.8750
	Total	3.2941	3.6667	3.7714	2.8438

Indeed, both insured and un-insured Hhs also differ in their tendencies to compulsory policy options for ZDS purchase according to their income levels. Likewise, middle and lower income levels tend to agree with compulsory purchase policy option. Despite, enforcing whole building instead of apartment units seem to convince also the higher income level Hhs among both insured and un-insured Hhs. With respect to housing assistance by State, un-insured Hhs in highest and lowest income levels thought that State should assist, whereas insured Hhs in lower income levels thought that State shouldn't assist. That is, un-insured Hhs in lowest income level seem to need State-aid more than insured Hhs in this income level (Table 6.95).

Socio-cultural attributes of Households: Agreement with 'compulsory' purchase policy option for ZDS is found as related to hierarchical and individualistic world-views among insured Hhs. However, compulsory policy option seems to cause fatalistic world-view among un-insured Hhs. In addition, forcing ZDS purchase for all units in the building is found as related to egalitarian world-view among insured Hhs. On the other hand, egalitarian world-view seems to be related to 'to enforce ZDS, people without insurance should be imposed with effective punishments' among un-insured Hhs. That is, some un-insured Hhs with egalitarian world-view also prefer 'compulsory' purchase of ZDS (Table 6.96).

Table 6.96. Compulsory Policy Option for ZDS and World-views of Households

Spearman's rho Correlation Coefficient	ZDS Purchase	Hierarchical World-view	Individualistic World-view	Fatalistic World-view	Egalitarian World-view	Perceived Controllability in Life
There should be enacted an "earthquake insurance law" that include effective punishments.	Insured	.350(**)	.482(**)	.120	.273(*)	.141
	Uninsured	.075	.227	.159	.415	.210
To oblige the earthquake insurance, the people without insurance should be imposed effective punishments.	Insured	.343(**)	.374(**)	.079	.171	.126
	Uninsured	.048	-.190	.293	.553(*)	.070
To prepare the society against earthquake, earthquake insurance should be obligatory.	Insured	.408(**)	.450(**)	.189	.364(**)	.310(**)
	Uninsured	.097	.154	.461(*)	.210	.018
ZDS should be compulsory for buildings instead of housing units.	Insured	.404(**)	.316(**)	.150	.325(**)	.172
	Uninsured	-.020	.101	.230	.012	.272
There should be monetary punishment for uninsureds.	Insured	.225(*)	.306(**)	.050	.147	.272(*)
	Uninsured	-.002	.232	.212	.310	-.075
There should be imprisoning for uninsureds.	Insured	.267(*)	.331(**)	.026	.273(*)	.184
	Uninsured	-.011	.248	.220	.275	-.105

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 80 and Uninsured :Listwise N = 20

Table 6.97. Compulsory Policy Option of ZDS and Perceived Earthquake Risk

Spearman's rho Correlation Coefficient	ZDS Purchase	Perceived Controllability of Earthquakes	Perceived probability of Earthquakes	Perceived total loss to themselves	Perceived risk
There should be enacted an "earthquake insurance law" that include effective punishments.	Insured	.176	.221	.262(*)	.273(*)
	Uninsured	-.298	.182	.149	.297
To oblige the earthquake insurance, the people without insurance should be imposed effective punishments.	Insured	.126	.109	.332(**)	.219
	Uninsured	-.196	.035	.220	.196
To prepare the society against earthquake, earthquake insurance should be obligatory.	Insured	.336(**)	-.009	.379(**)	.147
	Uninsured	-.233	.197	.363	.339
There should be monetary punishment for uninsureds.	Insured	.214	-.041	.275(*)	.070
	Uninsured	-.109	.135	-.032	.204
ZDS should be compulsory for buildings instead of housing units.	Insured	.213	-.093	.383(**)	.107
	Uninsured	-.300	.121	.486(*)	.330

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 66 and Uninsured :Listwise N = 20

Perception of Earthquake Risk: Perceived losses and perceived risk are found as directly related to Hhs' tendency to 'compulsory' policy option of ZDS among insured Hhs. However, some un-insured Hhs seem to perceive more losses, when they tend to policy option to enforce all units in the building to purchase ZDS. Moreover, perceived controllability of earthquakes is found as directly related to the statement as 'to prepare the society, ZDS should be compulsory' among insured Hhs. In contrast, un-insured Hhs seem not to tend compulsory policy option because of perceiving earthquakes as not controllable (Table 6.97). Thus, increasing perceived controllability of earthquakes and enforcing ZDS

purchase for the buildings instead of housing units seem to convince both insured and un-insured Hhs to purchase ZDS compulsorily.

Perceived Attributes of ZDS System: Both insured and un-insured Hhs that perceive ZDS 'compulsory' and as a 'social solidarity mechanism' seem to agree with 'compulsory' purchase policy option of ZDS through effective monetary punishments. This finding can indicate that some un-insured Hhs do not purchase ZDS although they perceive ZDS as compulsory because of any effective punishment. However, these Hhs seem to be more willing to purchase ZDS, if ZDS is implemented in terms of effective sanctions. In addition, enforcing Hhs to purchase ZDS seems to increase its perceive social solidarity attribute among both insured and un-insured Hhs, which can in turn increase ZDS purchase. However, increasing the social solidarity attribute of ZDS seems to depend on its contribution into risk mitigation, because both insured and un-insured Hhs agreed with compulsory purchase of ZDS in the case of 'preparing the society against earthquakes' (Table 6.98).

Table 6.98. 'Compulsory' Policy Option of ZDS and Perceived Attributes of Current ZDS System

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS as Compulsory	ZDS as Solidarity
There should be enacted an "earthquake insurance law" that include effective punishments.	Insured	.555(**)	.270(**)
	Uninsured	.526(**)	.301
To oblige the earthquake insurance, the people without insurance should be imposed effective punishments.	Insured	.689(**)	.338(**)
	Uninsured	.549(**)	.341
To prepare the society against earthquake, earthquake insurance should be obligatory.	Insured	.711(**)	.479(**)
	Uninsured	.731(**)	.480(**)
Earthquake insurance should be compulsory for the buildings instead of the housing units in the buildings.	Insured	.618(**)	.372(**)
	Uninsured	.400(*)	.179
There should be monetary punishment for uninsureds.	Insured	.471(**)	.245(*)
	Uninsured	.408(*)	.246
There should be imprisoning for uninsureds.	Insured	.258(*)	.063
	Uninsured	.329	.312

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 92 and Uninsured :Listwise N = 28

6.2.1.2. Implementing ZDS As Compulsory through Taxation Systems

To increase the penetration ratio of the ZDS system, insured Hhs tend to agree with 'declaration of a national state of war for ZDS', in contrast to un-insured Hhs,. Similarly, insured Hhs have more tendency to implement ZDS purchase as a tax for earthquakes, while un-insured Hhs are uncertain. However, both insured and un-insured Hhs agree with implementing ZDS through reflecting ZDS premiums into running costs. Reflecting ZDS premiums into compulsory payments such as property tax, electiricity, water, natural gas and telephone are the policy options agreed by both insured and

un-insured Hhs. Despite, both insured and un-insured Hhs seem not to agree with 'requiring ZDS contract during payment of electricity, water and natural gases'. In addition, reflecting ZDS premiums into property-tax seems to be agreed by both insured and un-insured Hhs, because there is observed no significant difference among them (Table 6.99).

Table 6.99. Tendencies of Hhs for Implementing ZDS as a Taxation system

	ZDS Purchase								
	Insured Hhs			Uninsured Hhs			Difference		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
A national state of war for insurance should be declared.	3.5500	120	1.23567	2.6857	35	1.38843	1359	-3.252	.001
Insurance should be thought as a tax for earthquake.	3.8594	128	1.26575	3.1795	39	1.29517	1735.5	-2.991	.003
ZDS can be reflected to the property-house tax.	3.5583	120	1.28204	3.1944	36	1.21466	1790.5	-1.599	.110
ZDS premiums can be reflected to other obligatory payments such as electricity, water, telephone.	3.7016	124	1.28139	3.2564	39	1.18584	1884.5	-2.146	.032
ZDS contracts should be required during the payment of electricity, water and natural gases invoices.	3.0159	126	1.32655	2.7143	35	1.38418	1922.5	-1.187	.235

Table 6.100. Correlations between Household Judgements for Implementing ZDS as Taxation System

Spearman's rho Correlation Coefficient	ZDS Purchase	1	2	3	4	5
1) A national state of war for ZDS should be declared.	Insured	1.000				
	Uninsured	1.000				
2) ZDS should be thought as a tax for earthquake.	Insured	.269(**)	1.000			
	Uninsured	.328	1.000			
3) ZDS can be reflected to the property-house tax.	Insured	.132	.356(**)	1.000		
	Uninsured	.433(*)	.398(*)	1.000		
4) ZDS premiums can be reflected to oter obligatory payments such as electricity, water, telephone.	Insured	.278(**)	.397(**)	.743(**)	1.000	
	Uninsured	.315	.439(*)	.683(**)	1.000	
5) ZDS policy should be required during the payment of electricity, water and natural gases invoices.	Insured	.414(**)	.326(**)	.213(*)	.249(**)	1.000
	Uninsured	.743(**)	.459(**)	.464(**)	.383(*)	1.000.

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 113 and Uninsured :Listwise N = 31

In addition, insured Hhs seem to think that 'a national state of war' can be achieved through 'thinking ZDS as an earthquake tax'. However, un-insured Hhs tend to think that a national war can be achieved through 'reflecting ZDS into property tax'. Such a difference is also observed for evaluations of other compulsory payments with ZDS by insured and un-insured Hhs. In other words, insured Hhs seem to think that 'a national state of war' can be achieved through 'reflecting ZDS premiums to other compulsory payments' and through 'requirement of ZDS contract during these compulsory payments'. However, un-insured Hhs tend to think that 'requirement of ZDS can be a better way' for 'a national state of war for ZDS purchase' (Table 6.100). Despite, un-insured Hhs were found as not prefering these policy options (Table 6.99).

Table 6.101. Implementing ZDS as 'Compulsory' and as 'Taxation System'

Spearman's rho Correlation Coefficient	ZDS Purchase	A national state of war should be declared	ZDS should be thought as a tax for earthquake	ZDS can be reflected to the property-house tax.	ZDS can be reflected to electricity, water, etc.	ZDS should be required during payment of electricity, water and natural gas
There should be enacted an "earthquake insurance law" that include effective punishments.	Insured	.305(**)	.636(**)	.508(**)	.532(**)	.534(**)
	Uninsured	.648(**)	.469(*)	.605(**)	.604(**)	.796(**)
To oblige ZDS, the people should be imposed effective punishments.	Insured	.235(*)	.649(**)	.441(**)	.420(**)	.471(**)
	Uninsured	.378(*)	.408(*)	.472(**)	.650(**)	.482(**)
To prepare the society against earthquake, ZDS should be obligatory.	Insured	.268(**)	.565(**)	.534(**)	.517(**)	.347(**)
	Uninsured	.565(**)	.483(**)	.628(**)	.683(**)	.594(**)
ZDS should be compulsory for the buildings.	Insured	.234(*)	.432(**)	.370(**)	.475(**)	.336(**)
	Uninsured	.157	.452(*)	.504(**)	.587(**)	.229
There should be monetary punishment for uninsureds.	Insured	.263(**)	.386(**)	.367(**)	.295(**)	.710(**)
	Uninsured	.631(**)	.566(**)	.449(*)	.529(**)	.795(**)
There should be imprisoning for uninsureds.	Insured	.251(*)	.312(**)	.306(**)	.198(*)	.571(**)
	Uninsured	.721(**)	.444(*)	.325	.430(*)	.782(**)

Agrement of both insured and un-insured Hhs with 'implementing ZDS through varying taxation systems' are found as correlated to their agreement with 'implementing ZDS as compulsory with effective punishments'. Accordingly, un-insured Hhs seem to disagree with 'a national state of war for ZDS' and 'thinking ZDS as an earthquake tax', when they also disagree with 'implementing ZDS as compulsory through effective punishments'. In contrast, insured Hhs that agree with the policy options involved with compulsory implementation of ZDS seem to agree with implementing ZDS through almost all taxation systems. However, 'requiring ZDS contracts during property tax' and 'other compulsory payments such as electricity and water', seem to convince un-insured Hhs to implement

ZDS as compulsory. Therefore, punishments that are implemented for these compulsory payments seem to be be implemented for ZDS system, because both insured and un-insured Hhs that agreed with monetary punishments seem to agree with these policy options (Table 6.101).

Socio-Economic Attributes of Hhs: Agreement with 'a national state of war' for ZDS purchase is found as directly related Hh-Head's age. That is, older Hh-Heads and Hhs in lower income levels tend to implementing a national state of war for ZDS purchase. However, declaring a national state of war for ZDS is found as inversely related to income level. In other words, higher income level Hhs seem not to agree with declaration of a national state of war for ZDS, particularly among insured Hhs. In the same way, higher income Hhs among insureds seem not to agree with reflecting ZDS premiums into other running costs such as electricity, water, and natural gas (Table 6.102).

Table 6.102. Implementing ZDS as aTaxation System and Household Attributes

Spearman's rho	ZDS Purchase	Hh-Head's Age	Education of Hh-Head by Years	Income Amount
Correlation Coefficient				
(1) A national state of war for insurance should be declared.	Insured	.251(**)	-.046	-.220(*)
	Uninsured	-.173	.193	-.065
(2) ZDS premiums can be reflected to other obligatory payments such as electricity, water, natural gas, etc.	Insured	.049	-.043	-.221(*)
	Uninsured	-.031	.142	.084
N				
(1)	Insured	113	110	110
	Uninsured	34	32	31
(2)	Insured	117	114	114
	Uninsured	38	36	34

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

In contrast, Hhs in middle and lower income levels seem to more agree with implementing ZDS as an earthquake tax or in terms of reflecting ZDS premiums into other compulsory payments among both insured and un-insured Hhs. Despite, un-insured Hhs in lowest income level do not tend to implement ZDS in these ways, since they seem to believe that they cannot afford to these payments in the case of compulsory purchase of ZDs. In addition, Hhs in all income levels seem to disagree with 'requiring ZDS contracts during other compulsory payments' among both insured and un-insured Hhs (Table 6.103).

Table 6.103. ZDS as Taxation System and Household Income Level

ZDS Purchase	Hh Income Level	A national state of war	ZDS as a tax for earthquake.	Reflecting ZDS into property tax	Reflecting ZDS into other obligatory payments such as electricity, water, telephone.	Requiring ZDS during the payment of electricity, water and natural gases
Insured	1.00 > 2000 YTL	2.8462	3.1538	2.8462	2.9286	3.0667
	2.00 2000-1000 YTL	3.3448	3.9688	3.7667	3.6250	2.7333
	3.00 999-751 YTL	3.7333	3.8438	3.7333	3.8333	3.0938
	4.00 750-500 YTL	4.0000	4.1429	3.7778	4.0526	2.7500
	5.00 > 499 YTL	3.6111	4.0000	3.5263	4.0000	3.5789
Uninsured	1.00 > 2000 YTL	2.0000	2.4000	3.0000	2.8000	1.0000
	2.00 2000-1000 YTL	3.0000	3.1667	3.6000	3.6667	2.8000
	3.00 999-751 YTL	3.1667	3.4286	2.8333	3.5714	3.2857
	4.00 750-500 YTL	2.7000	3.2727	3.6364	3.5455	2.9000
	5.00 > 499 YTL	2.7500	3.7500	3.1429	2.6250	2.7500

Socio-Cultural Attributes of Households: Hhs' agreement with "declaration of a national state of war" was expected to be involved with egalitarian world-view of Hhs. In contrast, agreement with this statement is found as related to individualistic world-view among both insured and un-insured Hhs. This can be because of expecting more losses to themselves than society. Therefore, they can benefit from such a national state of war. On the other hand, implementing ZDS as an earthquake tax seems to cause fatalistic world-view among both insured and un-insured Hhs. However, implementing ZDS through reflecting ZDS premiums into property tax and other running costs such as electricity, water and natural gas seem to be more appropriate policy options regarding their relationship with hierarchical and egalitarian world-views. Particularly, reflection of ZDS premiums into running costs such as electricity and water seem to be related to sense of belonging feeling of insured Hhs, which can increase ZDS purchase behavior, simultaneously (Table 6.104).

Both insured and un-insured Hhs are expected to perceive more losses to themselves depending on relationship between their agreement with 'declaration of a national state of war' and 'individualistic world-view' (Table 6.104). However, perceived losses and risks are found as related with 'declaration of a national state of war' only among insured Hhs. Likewise, perceived losses by insured Hhs is also related to other policy options of implementing ZDS as an earthquake tax, reflecting ZDS premiums into property tax and other running costs, significantly.

Table 6.104. World-views and Policy Options for Implementing ZDS as a Taxation System

Spearman's rho Correlation Coefficient	ZDS Purchase	A national state of war	ZDS as a tax for earthquake	Reflecting ZDS into property tax	Reflecting ZDS into other obligatory payments such as electricity, water, natural gas, etc.	Requiring ZDS during the payment of electricity, water and natural gas.
Hierarchical World-view	Insured	.185	.239(*)	.292(**)	.337(**)	.082
	Uninsured	.158	.139	.046	-.154	.234
İndividualistic World-view	Insured	.350(**)	.330(**)	.345(**)	.327(**)	.270(**)
	Uninsured	.504(*)	.276	.037	.002	.378
Fatalistic World-view	Insured	.122	.271(**)	.182	.133	.105
	Uninsured	.262	.464(*)	-.196	.170	.185
Egalitarian World-view	Insured	.177	.237(*)	.260(*)	.283(**)	.126
	Uninsured	.291	.269	.080	.464(*)	.252
Sense of Belonging	Insured	.076	.065	.200	.223(*)	.130
	Uninsured	-.149	-.021	-.237	-.112	-.245

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 91 and Uninsured :Listwise N = 20

Perception of Earthquake Risk: Indeed, perception of losses to themselves seem to be involved with 'policy option to implement ZDS as an earthquake tax' among both insured and un-insured Hhs (Table 6.105). However, this policy option was also found as related to fatalistic world-view (Table 6.104). Therefore, both insured and un-insured Hhs that perceive more losses to themselves can be more fatalistic, if ZDS is implemented as an earthquake tax. However, tendency of un-insured Hhs to these policy options are found as not related to perceived earthquake risk (Table 6.105).

Table 6.105. ZDS as a Taxation System and Earthquake Risk Perception

Spearman's rho Correlation Coefficient	ZDS Purchase	perceived probability	perceived total loss to themselves	Perceived risk	Perceived Controllability of Earthquakes
A national state of war	Insured	.117	.368(**)	.233(*)	.377(**)
	Uninsured	.183	-.185	.097	-.176
ZDS as a tax for earthquake.	Insured	.097	.366(**)	.199	.205
	Uninsured	.131	.333	.307	-.166
Reflecting ZDS into property tax	Insured	.085	.307(**)	.132	.344(**)
	Uninsured	-.031	.061	.029	-.111
Reflecting ZDS into other obligatory payments such as electricity, water, telephone.	Insured	.156	.360(**)	.239(*)	.416(**)
	Uninsured	-.047	.192	.064	-.140

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 77 and Uninsured :Listwise N = 20

Perceived Attributes of Existing ZDS System: Agreement with 'implementing a national state of war', 'through property taxation' and 'through reflection on other compulsory payments' are found as related to 'perception of ZDS as compulsory' among both insured and un-insured Hhs. That is, un-insured Hhs that perceive ZDS compulsory seem to need more encouragement for ZDS purchase, because their decline in purchasing ZDS seems to involved with lack of effective enforcements in the existing ZDS system. Therefore, creating these conditions seem to cause these un-insured Hhs to purchase ZDS. In addition, declaration of a national state of war and reflecting ZDS into other compulsory payments seem to create social solidarity among both insured and un-insured Hhs (Table 6.106).

Table 6.106. ZDS as a Taxation System and Perceived Attributes of Current ZDS System

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS as Compulsory	ZDS as Social Solidarity
A national state of war	Insured	.332(**)	.381(**)
	Uninsured	.496(**)	.369
ZDS as a tax for earthquake.	Insured	.537(**)	.146
	Uninsured	.249	.371
Reflecting ZDS into property tax	Insured	.326(**)	.314(**)
	Uninsured	.525(**)	.029
Reflecting ZDS into other obligatory payments such as electricity, water, telephone.	Insured	.455(**)	.357(**)
	Uninsured	.584(**)	.339
Requiring ZDS during the payment of electricity, water and natural gases	Insured	.393(**)	.071
	Uninsured	.449(*)	.207

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 104 and Uninsured :Listwise N = 28

6.2.1.3. Implementing ZDS As Voluntary with Incentives

Both insured and un-insured Hhs seem not to prefer voluntary purchase of ZDS, because they tend to be uncertain about this policy option. Likewise, both insured and un-insured Hhs seem not to prefer 'privatization of ZDS' completely as independent from State. However, un-insured Hhs agreed with voluntary purchase of ZDS contracts more than insured Hhs. Despite, un-insured Hhs seem to be less willingness to purchase ZDS in voluntary conditions. In other words, insured Hhs agreed with 'people should be encouraged to purchase ZDS voluntarily' more than un-insured Hhs, when this difference is statistically significant (Table 6.107).

Table 6.107. Policy Option for Implementing ZDS Voluntary and ZDS Purchase

	ZDS Purchase								
	Insured Hhs			Un-insured Hhs			Difference		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
ZDS should be bought completely voluntarily	3.1513	119	1.273	3.2162	37	1.315	2131.5	-.300	.764
People should be encouraged and persuaded to buy ZDS voluntarily.	4.1525	118	.975	3.6389	36	1.268	1632	-2.250	.024
ZDS should be given to private sector as independent from State.	2.9153	118	1.264	3.0000	35	1.455	1990	-.337	.736

In addition, an inverse relationship is obseved between agreement with compulsory purchase of ZDS and agreement with voluntary purchase of ZDS. This finding indicates that both insured and un-insured Hhs that agreed with compulsory purchase of ZDS through effective punishments disagreed with completely voluntary implementation of ZDS, particularly insured Hhs. Despite, both insured and un-insured Hhs that agreed with compulsory implementation of ZDS agreed also with encouragement and persuasion of people to purchase ZDS voluntarily. This indicates that all Hhs in Zeytinburnu survey prefer that everybody in society will purchase ZDS (Table 6.108).

On the other hand, un-insured Hhs, who agree with completely voluntary implementation of ZDS, disagree with monetary punishments. However, both insured and un-insured Hhs tend to think that extensive purchase of ZDS can be in terms of obligations, when making ZDS purchase compulsory for the buildings instead of housing units seem to encourage both insured and un-insured Hhs. However, none of these policy options are found as related to privatization of the ZDS system. This finding can indicate that both insured and un-insured Hhs seem not to prefer private sector to implement these policies (Table 6.108).

Table 6.108. Households' Tendencies for Compulsory and Voluntary Implementation of ZDS

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS should be bought completely voluntarily	People should be encouraged and persuaded to buy ZDS voluntarily.	ZDS should be given to private sector as independent from State.
"Earthquake insurance law" that include effective punishments should be enacted	Insured	-.209(*)	.270(**)	.051
	Uninsured	-.281	.368(*)	.109
To prepare the society against earthquakes, ZDS should be obligatory.	Insured	-.024	.426(**)	.081
	Uninsured	-.145	.502(**)	.277
ZDS should be compulsory for the buildings instead of housing units.	Insured	.093	.410(**)	.100
	Uninsured	-.075	.645(**)	.010
There should be monetary punishment for uninsureds.	Insured	-.200	.092	-.039
	Uninsured	-.390(*)	.174	.163

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 95; Uninsured :Listwise N = 32

Table 6.109. Communication Related Policy Options to Encourage ZDS Purchase

	ZDS Purchase								
	Insured Hhs			Un-insured Hhs			Difference		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
There should be more advertisements in television.	4.3906	128	.86247	3.7879	33	1.11124	1388	-3.328	.001
There should be television programs, which explain earthquake and ZDS.	4.4846	130	.68466	4.0286	35	.92309	1592	-3.051	.002
There should be courses in the schools, which explain earthquake and ZDS.	4.3906	128	.74490	3.4545	33	1.27698	1198	-4.146	.000

Advertisements on TV about ZDS could be a way to increase awareness. Indeed, both insured and un-insured Hhs think that there should be more advertisements on TV about ZDS. However, insured Hhs tend also to strongly agree with 'there should be courses in the schools, which explain earthquake and ZDS' more than un-insured Hhs. Despite, these policy options seem not to convince un-insured Hhs to purchase ZDS, because their agreement level differs from insured Hhs significantly (Table 6.109). Instead, both insured and un-insured Hhs seem to be more convinced with 'premium discount' and 'discount in house-tax' in the case of renewing ZDS contracts each year. Indeed, agreement of un-insured Hhs with these two policies is more than their agreement with other policy options. Likewise, both insured and un-insured Hhs agree with 'certification of buildings' for houses that are insured each year (Table 6.110).

Table 6.110. Policy Options to Offer ZDS Incentives and ZDS Purchase

	ZDS Purchase								
	Insured Hhs			Un-insured Hhs			Difference		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
If all homeowners in a building are insured, this building should get a certificate each year.	4.1120	125	.99366	3.6667	33	1.24164	1636.5	-1.950	.051
The buildings that renew their insurance policies each year should be offered premium discount.	4.3968	126	.87708	4.3235	34	.84282	2017.5	-.583	.560
The buildings that renew their insurance policies each year should be offerred discount in housing tax.	4.3065	124	.93858	4.0857	35	.91944	1824.5	-1.574	.116

Table 6.111. Policy Options for Voluntary Purchase and Incentives

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS should be bought completely voluntarily	People should be encouraged and persuaded to buy insurance voluntarily.	ZDS should be given to the private sector as independent from State.
If all homeowners in a building are insured, this building should get a certificate each year.	Insured	.073	.372(**)	-.031
	Uninsured	-.216	.557(**)	.246
The buildings that renew their insurance policies each year should be offered premium discount.	Insured	.084	.479(**)	.071
	Uninsured	.236	.410(*)	.186
The buildings that renew their insurance policies each year should be offerred discount in housing tax.	Insured	.196	.378(**)	.050
	Uninsured	.300	.293	.031

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 99; Uninsured :Listwise N = 33

In addition, certifying buildings and offering discounted ZDS premiums seem to encourage people to purchase ZDS, because both insured and un-insured Hhs think that certification of buildings and discounted ZDS premiums can be used to encourage people to purchase ZDS voluntarily. Indeed, this policy option seem to encourage particularly un-insured Hhs. This can be because of their unwillingness to purchase ZDS each year. Moreover, insured Hhs think that 'discounted property tax' can be another way to encourage people to purchase ZDS. However, implementing these policy options seem to be given to private sector as independent from State (Table 6.111).

Table 6.112. Policy Options for Incentives and Compulsory Purchase

Spearman's rho Correlation Coefficient	ZDS purchase	If all homeowners in a building are insured, this building should be offerred a certificate each year.	The buildings that renew their insurance policies each year should be offerred premium discount.	The buildings that renew their insurance policies each year should be offerred discount in housing tax.
There should be enacted an "earthquake insurance law" that include effective punishments.	Insured	.362(**)	.264(**)	.319(**)
	Uninsured	.747(**)	.220	.107
To oblige the earthquake insurance, the people without insurance should be imposed effective punishments	Insured	.380(**)	.317(**)	.240(*)
	Uninsured	.461(**)	.026	-.030
To prepare the society against earthquake, earthquake insurance should be obligatory.	Insured	.502(**)	.473(**)	.423(**)
	Uninsured	.653(**)	.182	.001
Earthquake insurance should be compulsory for the buildings instead of the housing units in the buildings.	Insured	.484(**)	.407(**)	.582(**)
	Uninsured	.521(**)	.355(*)	.100
There should be monetary punishment for uninsureds.	Insured	.371(**)	.212(*)	.215(*)
	Uninsured	.538(**)	-.114	-.110
There should be imprisoning for uninsureds.	Insured	.236(*)	.075	.170
	Uninsured	.440(*)	-.136	-.084

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 101; Uninsured :Listwise N = 31

Both insured and un-insured Hhs that accept compulsory purchase of ZDS agreed also with 'certification of insured buildings'. Despite, insured Hhs seem to be more convinced with premium discounts and discounted housing tax, in addition to effective punishments. However, un-insured Hhs that think 'ZDS should be compulsory for the buildings' also agreed with ZDS premium discounts. In other words, insured Hhs seem to be purchase ZDS in the future, because they have agreed with compulsory implementation through effective monetary punishments and imprisoning as well as through rewards such as certification of building, premium and property tax discounts. However, un-insured Hhs seem to be uncertain about their ZDS purchase in the future. Thus, they seem to prefer ceritification of building and ZDS premium discounts in the case of forcing ZDS purchase in the building. That is, they appear to prefer collective policies instead of individualistic ones (Table 6.112).

On the other hand, insured Hhs thought that 'declaration of a national state of war' can be one way to persuade people to purchase ZDS, whereas un-insured Hhs thought that 'implementing ZDS as an earthquake tax' can be more effective for the same purpose. In addition, both insured and un-insured Hhs evaluated 'reflecting ZDS into property tax' and 'other compulsory payments' as other essential ways to persuade people to purchase ZDS. Particularly, un-insured Hhs seem to be convinced by reflecting Although these policy options that are involved with taxation systems are also inversely related ZDS premiums into property tax and other running costs. That is, if these policy options are implemented, both insured and un-insured Hhs seem to be convinced to purchase ZDS (Table 6.113).

Table 6.113. Policy Options for Taxation Systems and Voluntary Purchase

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS should be bought completely voluntarily	People should be encouraged and persuaded to buy ZDS voluntarily.	ZDS should be given to the private sector as independent from State.
A national state of war for ZDS should be declared.	Insured	-.038	.281(**)	.121
	Uninsured	.027	.319	.162
ZDS should be thought as a tax for earthquake	Insured	.043	.192	.020
	Uninsured	-.010	.375(*)	-.059
ZDS can be reflected to the property-house tax.	Insured	-.055	.288(**)	-.019
	Uninsured	-.185	.542(**)	.084
ZDS premiums can be reflected to other obligatory payments such as electricity, water, telephone.	Insured	-.090	.243(*)	-.036
	Uninsured	-.185	.586(**)	.063
ZDS should be required during the payment of electricity, water and natural gases invoices.	Insured	-.087	.107	.055
	Uninsured	-.160	.285	.196

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 98 and Uninsured :Listwise N = 30

Table 6.114. Policy Options for Taxation System and Incentives

Spearman's rho Correlation Coefficient	ZDS Purchase	If all homeowners in a building are insured, this building should be offerred a certificate each year.	The buildings that renew their insurance policies each year should be offerred premium discount.	The buildings that renew their insurance policies each year should be offerred discount in housing tax.
A national state of war for insurance should be declared.	Insured	.353(**)	.218(*)	.249(**)
	Uninsured	.629(**)	.061	.282
ZDS should be thought as a tax for earthquake.	Insured	.264(**)	.354(**)	.258(**)
	Uninsured	.351	.123	.071
ZDS can be reflected to property-house tax.	Insured	.294(**)	.369(**)	.307(**)
	Uninsured	.534(**)	.396(*)	.347
ZDS premiums can be reflected to other obligatory payments such as electricity, water, telephone.	Insured	.352(**)	.294(**)	.355(**)
	Uninsured	.534(**)	.311	.188
ZDS policy should be required during the payment of electricity, water and natural gases invoices.	Insured	.254(**)	.098	.179
	Uninsured	.710(**)	.144	.109

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 109; Uninsured :Listwise N = 29

Both insured and un-insured Hhs seem to think that 'certification of buildings' can be one way to 'declare a national state of war for ZDS'. Moreover, certification of buildings seem to be involved with 'reflecting ZDS premiums into property tax' and 'other compulsory payments' as well as with 'requirement of ZDS for these compulsory payments'. Indeed, implementing ZDS in these ways can provide certification of buildings easily, which can be achieved through cooperation of ZDS with local administrations. Likewise, discounted ZDS premiums and their reflection into property tax are also agreed by both insured and un-insured Hhs, when these are related to each other (Table 6.114). If ZDS is implemented in terms of reflecting ZDS premiums into property tax, both insured and un-insured Hhs seem to expect premium discounts and/or discounts in property tax. In other words, 'certification of buildings' may be 'key policy' to increase the penetration ratio of ZDS, which can be achieved through reflection of ZDS premiums into property tax or other running costs. In turn, Hhs can be rewarded by premium discounts and property tax discounts (Table 6.114).

Socio-Economic Attributes of Households: Agreement with 'voluntary' purchase of ZDS is found as inversely related to Hh income level among un-insured Hhs significantly. That is, un-insured Hhs in lower income level seem to agree with the policy option to purchase ZDS 'voluntarily', because they can think that they will not afford to premiums if they are forced to purchase ZDS. Indeed, lower income levels among insured and un-insured Hhs seem not to purchase ZDS in voluntary conditions, because they appear to not agree with encouragement and persuasion of people to purchase ZDS in voluntary conditions. On the other hand, premium discounts and discounted house-tax seem to be

preferred by lower income level Hhs among both insureds and un-insureds. However, these encouragements can be insufficient to include lowest income Hhs that declined purchasing ZDS in the existing system. Therefore, un-insured Hhs in lowest income level seem to in need of additional social policies to purchase ZDS (Table 6.115).

Table 6.115. Policy Option for Voluntary Purchase of ZDS and Household Attributes

Spearman's rho Correlation Coefficient	ZDS Purchase	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)
ZDS should be bought completely voluntarily	Insured	-.169	-.080
	Uninsured	.092	-.534(**)
People should be encouraged and persuaded to buy ZDS voluntarily.	Insured	.012	-.167
	Uninsured	.070	-.020
ZDS should be given to te private sector as independent from State.	Insured	.040	.086
	Uninsured	-.097	-.200
If all homeowners in a building are insured, this building should become a certificate each year.	Insured	-.048	-.175
	Uninsured	.144	-.320
The buildings that renew their insurance policies each year should be offerred premium discount.	Insured	.008	-.258(*)
	Uninsured	.078	-.211
The buildings that renew their insurance policies each year should be offerred discounted property tax.	Insured	-.107	-.247(*)
	Uninsured	.346	-.227

** Correlation is significant at the 0.01 level (2-tailed). Insured :Listwise N = 89 and Uninsured :Listwise N = 27

Socio-Cultural Attributes of Households: Indeed, agreement of insured Hhs with 'people should be encouraged to purchase ZDS voluntarily' seems to involved with their hierarchical and egalitarian world-views as well as their feelings as sense of belonging and perceived controllability in life. In other words, agreement with this policy option do not arise from individualistic world-views. Indeed, these Hhs seem not to agree with completely voluntary purchase of ZDS. However, they seem to agree with extensive purchase of ZDS by all Hhs in the society to protect everyone from earthquake losses. On the other hand, insured Hhs with individualistic world-view seem to prefer 'privatization' of ZDS. However, voluntary purchase of ZDS can cause fatalistic world-view among insured Hhs, because completely voluntary purchase of ZDS in the society seems to be preferred by the Hhs that have fatalistic world-views. In addition, un-insured Hhs that feel their life less controllable seem to disagree with the privatization of ZDS system (Table 6.116).

Table 6.116. World-views and Policy Option for Voluntary Implementation of ZDS System

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS should be bought completely voluntarily	People should be encouraged and persuaded to buy ZDS voluntarily.	ZDS should be given to the private sector as independent from State.
Hierarchical World-view	Insured	.103	.230(*)	.063
	Uninsured	-.412	-.175	-.393
İndividualistic World-view	Insured	.038	.187	.261(*)
	Uninsured	-.177	.179	-.403
Fatalistic World-view	Insured	.239(*)	.030	.176
	Uninsured	-.182	.010	-.228
Egalitarian World-view	Insured	.121	.383(**)	.100
	Uninsured	-.216	.191	-.244
Sense of belonging	Insured	.130	.274(*)	.181
	Uninsured	-.312	.099	-.231
Perceived Controllability in Life	Insured	.097	.253(*)	.150
	Uninsured	-.330	-.046	-.666(**)

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 82 and Uninsured :Listwise N = 22

Incentives to increase ZDS purchase, e.g. certification of building, premium discounts and discounted house tax, are found as involved with almost all world-views among insured Hhs. However, individualistic world-view seems to be stronger world-view. That is, such a policy option can be more understood by Hhs that have individualistic world-view. Despite, certification of buildings and premium discounts seem to increase sense of belonging and egalitarian world-views that are found as involved with ZDS purchase and risk mitigation willingness (Table 6.117).

Table 6.117. Incentives and World-views of Households

Correlation Coefficient	ZDS Purchase	If all homeowners in a building are insured, this building should be offerred a certificate each year.	The buildings that renew their insurance policies each year should be offerred premium discount.	The buildings that renew their insurance policies each year should be offerred discount in housing tax.
Hierarchical World-view	Insured	.299(**)	.388(**)	.356(**)
	Uninsured	.242	-.018	.056
İndividualistic World-view	Insured	.407(**)	.305(**)	.254(*)
	Uninsured	.348	.027	.071
Egalitarian World-view	Insured	.289(**)	.312(**)	.294(**)
	Uninsured	.324	.165	.290
Sense of belonging	Insured	.246(*)	.302(**)	.160
	Uninsured	.069	.164	.049

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 90 and Uninsured :Listwise N = 22

Earthquake Risk Perception: Insured Hhs that perceive earthquake more controllable and more losses to themselves seem to agree with the necessity to encourage people to purchase ZDS. Despite, perceived controllability of earthquakes is found as inversely related with the same statement among un-insured Hhs. That is, disagreement of un-insured Hhs with 'encouragement and persuasion of people to purchase ZDS' can be because of their perception of earthquakes as uncontrollable. On the other hand, perceived total losses among un-insured Hhs is found as inversely related to 'privatization of ZDS as independent from State'. In other words, un-insured Hhs that perceive more total losses to themselves do not prefer a completely privatized ZDS system (Table 6.118). This can be because of their expectation of State-aid.

Table 6.118. Earthquake Risk Perception and Voluntary Implementation of ZDS System

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS should be bought completely voluntarily	People should be encouraged and persuaded to buy ZDS voluntarily.	ZDS should be given to the private sector as independent from State.
Perceived Controllability of Earthquakes	Insured	.120	.274(*)	.211
	Uninsured	-.153	-.225	.068
Perceived probability	Insured	-.116	.029	-.053
	Uninsured	.192	.107	.084
Perceived total loss to themselves	Insured	.123	.355(**)	.022
	Uninsured	-.238	-.022	-.503(*)
Perceived risk	Insured	-.058	.177	-.062
	Uninsured	-.054	.129	-.108

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 74 and Uninsured :Listwise N = 22

Table 6.119. Risk Perception and Incentives

Spearman's rho Correlation Coefficient	ZDS Purchase	If all homeowners in a building are insured, this building should be offerred a certificate each year.	The buildings that renew their insurance policies each year should b offerred premium discount.	The buildings that renew their insurance policies each year should be offerred discount in housing tax.
Perceived Controllability of Earthquakes	Insured	.294(**)	.373(**)	.251(*)
	Uninsured	-.153	-.074	.011
perceived probability	Insured	.023	.078	.040
	Uninsured	.315	.085	.160
perceived total loss to themselves	Insured	.491(**)	.386(**)	.286(**)
	Uninsured	.108	-.081	-.228
Perceived risk	Insured	.191	.205	.150
	Uninsured	.335	.094	.018

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 81 and Uninsured :Listwise N = 22

Insured Hhs that perceive more losses to themselves and that perceive earthquakes more controllable tend to agree with implementing ZDS through incentives such as certification of building, discounted premiums and discounted property taxes. For this reason, increasing penetration ratio in terms of risk awareness strategies seem to require increasing both perceived specific losses and perceived controllability of earthquakes among un-insured Hhs (Table 6.119).

Perceived Attributes of ZDS System

Next, both insured and un-insured Hhs that perceive ZDS purchase as compulsory in the existing system seem to disagree with voluntary purchase policy option. These Hhs seem to prefer encouragement of people to purchase ZDS. However, agreement of insured Hhs for encouragement of people appears to be involved with perceiving the existing ZDS system as a social solidarity mechanism, in contrast to un-insured Hhs. In addition, insured Hhs that trust on ZDS seem to agree with voluntary purchase of ZDS. However, this findings can indicate that some insured Hhs in the existing ZDS system can decline purchasing ZDS, if ZDS purchase is made completely voluntary, because trust and voluntary purchase seem to have inverse influence on ZDS purchase. On the other hand, the un-insured Hhs that trust on ZDS system seem to disagree with privatization of ZDS. That is, these Hhs appear to not purchase ZDS if, ZDS system is left to completely voluntarily conditions. On the other hand, agreement of insured Hhs with both social solidarity mechanism of ZDS and privatization of ZDS can indicate another way to implement ZDS as a non-governmental organization (NGO) (Table 6.120).

Table 6.120. 'Voluntary' Purchase of ZDS and Perceived Attributes of Existing ZDS System

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS as Compulsory	ZDS as Social Solidarity	Being confused	Trust
Earthquake insurance should be bought completely voluntarily	Insured	-.152	.014	-.063	-.217(*)
	Uninsured	-.330	.099	.075	-.003
People should be encouraged and persuaded to buy insurance voluntarily.	Insured	.327(**)	.392(**)	.496(**)	-.030
	Uninsured	.519(**)	.111	.392(*)	-.072
Obligatory eartquake insurance should be given to private sector as independent from State.	Insured	.031	.203(*)	.020	.010
	Uninsured	.230	-.235	.009	-.501(**)

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 96 and Uninsured :Listwise N = 29

Table 6.121. 'Incentives' and 'Perceived Attributes of Current ZDS System'

Spearman's rho Correlation Coefficient	ZDS Purchase	If all homeowners in a building are insured, this building should be offerred a certificate each year.	The buildings that renew their insurance policies each year should be offerred premium discount.	The buildings that renew their insurance policies each year should be offerred discount in housing tax.
ZDS as Compulsory	Insured	.467(**)	.382(**)	.312(**)
	Uninsured	.528(**)	.165	.001
ZDS as Social Solidarity	Insured	.317(**)	.312(**)	.212(*)
	Uninsured	.325	.251	.328

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 105 and Uninsured :Listwise N = 28

Agreement with certification of buildings for regular purchase of ZDS seems to be involved with perception of ZDS purchase as compulsory in the existing system, among both insured and un-insured Hhs. That is, although un-insured Hhs that perceive ZDS purchase compulsory in the existing system do not purchase ZDS. However, certification of buildings seems to encourage or persuade these people to purchase ZDS regularly. In addition, purchasers of ZDS in the existing system seem to continue to purchase ZDS, if premium discounts and discounted property taxes are offered. Implementing these policy options seem also to increase the solidarity attribute of ZDS system (Table 6.121).

6.2.2. Coverage of ZDS and Way for Premium Determination

Inclusion of Homeowners According to Risk Levels

Both insured and un-insured Hhs disagreed with 'forcing only houses at higher risk to purchase ZDS', although insured Hhs disagreed more than un-insureds. In contrast, all Hhs agreed with 'everyone including people with low risk should purchase ZDS', when insured Hhs agreed more than un-insured Hhs. Likewise, all Hhs, particularly insured Hhs, also agreed with 'it is not fair if some purchase ZDS, while others do not'. In addition, all Hhs, particularly un-insured Hhs, agreed with 'people at lower risk should pay lower premiums'. Despite, both insured and un-insured Hhs agreed with 'ZDS premiums should not differ according to risk level'. In contrast, insured Hhs tend to agree also with 'ZDS premiums should differ according to risk level so that homeowners will be encouraged to minimize earthquake risk', while un-insured Hhs tend to be uncertain about this statement and the difference is significant (Table 6.122).

Table 6.122. ZDS Coverage and Premiums According to Risk Level and ZDS Purchase

	ZDS Purchase								
	Insured			Uninsured			Differences		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
Only those with high risk should be forced to buy ZDS.	2.2203	118	1.01388	2.8529	34	1.30575	1423.5	-2.745	.006
Everyone including people with low risk should purchase ZDS.	4.3083	133	.80886	3.6154	39	1.13822	1659.5	-3.673	.000
It is not fair while some purchase ZDS, others do not.	4.2248	129	.94572	3.5946	37	1.14162	1605.5	-3.245	.001
People at lower risk should pay lower premiums.	3.5680	125	1.41613	3.7429	35	1.24482	2086.5	-.432	.665
Annual ZDS payments should not differ according to risk level.	3.4050	121	1.41173	3.5833	36	1.44173	2008	-.731	.465
ZDS premiums should differ according to risk level so that homeowners will be encouraged to minimize earthquake risk	3.7227	119	1.23456	3.1714	35	1.31699	1588.5	-2.201	.028

Some insured and un-insured Hhs that disagreed with 'only those at high risk should be forced to purchase ZDS' agreed with 'everyone including people with low risk should purchase ZDS'. In addition, for these Hhs, forcing only people at high risk to purchase ZDS is not fair. Moreover, insured Hhs agreed with 'determination of ZDS premiums according to risk level', when they also agreed with 'people at lower risk should pay lower premiums'. However, un-insured Hhs thought that 'everyone including low risk should be forced to purchase ZDS', when they also thought that 'ZDS premiums should not difer according to risk level'. That is, they may tend to agree with implementation of flat-rated premiums to include everybody in society to ZDS system. Indeed, they also seem not to believe that risk-rated premiums can encourage people to take RMMs in the building (Table 6.123).

Table 6.123. Correlations between Determination of Premiums and Fairness

Spearman's rho Correlation Coefficient	Being Insured	1	2	3	4	5	6
(1) Only those with high risk should be forced to buy earthquake insurance	Insured	1.000					
	Uninsured	1.000					
(2) Everyone including people with low risk should purchase earthquake insurance.	Insured	-.263(**)	1.000				
	Uninsured	-.199	1.000				
(3) It is not fair while some are purchasing insurance, others are not.	Insured	-.211(*)	.649(**)	1.000			
	Uninsured	-.025	.290	1.000			
(4) People at lower risk should pay lower premiums.	Insured	-.080	.010	.064	1.000		
	Uninsured	-.060	-.226	.437(*)	1.000		
(5) The annual insurance payments should not change according to the risk level.	Insured	.173	.046	-.025	-.008	1.000	
	Uninsured	.144	.419(*)	.342	.015	1.000	
(6) Insurance premiums should differ in respect of risk so that homeowners will be encouraged to minimize the possible risks.	Insured	.052	.072	.156	.282(**)	.108	1.000
	Uninsured	-.090	-.245	-.116	.123	-.452(*)	1.000

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 97, Uninsured :Listwise N = 27

Table 6.124. Inclusion of People into ZDS and Compulsory Purchase of ZDS

Spearman's rho Correlation Coefficient	Being Insured	There should be enacted an "earthquake insurance law" that include effective punishments.	To oblige the ZDS, the people without insurance should be imposed effective punishments.	To prepare the society against earthquake , ZDS should be obligatory.	ZDS should be compulsory for the buildings instead of the housing units in the buildings.	There should be monetary punishment for uninsureds .	There should be imprisoning for uninsureds.
Only those with high risk should be forced to buy earthquake insurance.	Insured	-.029	-.132	.001	-.109	-.149	-.009
	Uninsured	-.178	-.050	-.246	-.334	-.105	-.056
Everyone including people with low risk should purchase earthquake insurance.	Insured	.488(**)	.554(**)	.596(**)	.378(**)	.409(**)	.201
	Uninsured	.559(**)	.516(**)	.829(**)	.549(**)	.320	.218
It is not fair while some are purchasing insurance, others are not.	Insured	.470(**)	.562(**)	.467(**)	.461(**)	.393(**)	.206
	Uninsured	.049	.299	.374	.472(*)	-.004	-.162
People at lower risk should pay lower premiums.	Insured	-.069	-.128	-.085	-.002	-.182	-.240(*)
	Uninsured	-.294	-.154	-.109	.113	-.284	-.287
The annual insurance payments should not change concerning the risk level.	Insured	.187	.200	.222(*)	.267(*)	.280(**)	.184
	Uninsured	.233	.188	.490(*)	.397(*)	-.016	-.028
Insurance premiums should differ in respect of risk so that homeowners will be encouraged to minimize the possible risks.	Insured	.125	.136	.088	.056	.163	.053
	Uninsured	-.041	.036	-.174	-.039	.113	.072

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 90; Uninsured :Listwise N = 25

Inclusion of all people, particularly people at low risk, seem to be achieved through compulsory implementation of ZDS, according to both insured and un-insured Households' judgments. In addition, fairness through purchase of ZDS by everybody seem to be achieved through 'forcing ZDS purchase' for whole building instead of housing units. This is agreed by both insured and un-insured Hhs. However, other ways for implementing ZDS purchase compulsorily through effective punishments are also agreed by insured Hhs due to the same fairness purpose (Table 6.124).

On the other hand, both insured and un-insured Hhs thought that inclusion of everybody to ZDS system can be achieved in terms of reflecting ZDS premiums into property tax and other compulsory payments. In addition, they also seem to think that fairness in the society, i.e. purchase of ZDS by everybody, can be achieved if ZDS can be thought as an earthquake tax and if ZDS premiums can be reflected into other running costs (Table 6.125).

Table 6.125. Inclusion of People into ZDS and Taxation Methods

Spearman's rho Correlation Coefficient	ZDS Purchase	A national state of war for insurance should be declared.	ZDS should be thought as a tax for earth-quake.	ZDS can be reflected to the property-house tax.	ZDS premiums can be reflected to other obligatory payments such as electricity, water, telephone.	ZDS should be required during the payment of electricity, water and natural gas.
Everyone including people with low risk should purchase ZDS.	Insured	.366(**)	.485(**)	.336(**)	.345(**)	.312(**)
	Uninsured	.347	.236	.567(**)	.635(**)	.433(*)
It is not fair while some are purchasing ZDS, others are not.	Insured	.306(**)	.373(**)	.228(*)	.293(**)	.330(**)
	Uninsured	-.070	.471(*)	.366	.400(*)	.030

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 89; Uninsured :Listwise N = 25

Table 6.126. Inclusion of People to ZDS and Voluntary Purchase of ZDS

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS should be bought completely voluntarily	People should be encouraged and persuaded to buy ZDS voluntarily.
Only those with high risk should be forced to buy ZDS.	Insured	.258(*)	-.100
	Uninsured	.209	-.277
Everyone including people with low risk should purchase ZDS.	Insured	-.199	.303(**)
	Uninsured	-.113	.587(**)
It is not fair while some are purchasing ZDS, others are not.	Insured	-.154	.320(**)
	Uninsured	.103	.352

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 85; Uninsured :Listwise N = 26

However, insured Hhs seem to think that people at high risk should be forced to purchase ZDS, if ZDS purchase is left to voluntary decisions. Indeed, encouraging and persuading people to purchase ZDS seem to be one way to prevent unfairness that can arise from leaving people to their voluntary decisions, as observed in the judgements of insured Hhs. As agreed by both insured and un-insured Hhs, including everyone into ZDS system even if they have low risk properties seem to be achieved by encouraging people to purchase ZDS (Table 6.126).

On the other hand, another way to include people at low risk seem to be certification of buildings as agreed by both insured and un-insured Hhs. In addition, insured Hhs also think that premium discounts and discounts in property tax can be used for this purpose. According to insured Hhs, these incentives, i.e. certification of buildings, premium discounts and discounted property taxes can also prevent unfairness in society that arise from not participating to ZDS system (Table 6.127).

Table 6.127. Policy Options to Include People into ZDS System and Incentives

Spearman's rho Correlation Coefficient	ZDS Purchase	Certification of Building	Premium discount.	Discounted Property Tax
Everyone including people with low risk should purchase earthquake insurance.	Insured	.419(**)	.337(**)	.240(*)
	Uninsured	.622(**)	.301	.069
It is not fair while some are purchasing insurance, others are not.	Insured	.414(**)	.269(**)	.312(**)
	Uninsured	.110	.257	.180

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed). Insured :Listwise N = 93; Uninsured :Listwise N = 25

Table 6.128. Perceived Fairness According to Risk-based premiums and Household Attributes

Spearman's rho Correlation Coefficient	ZDS Purchase	Everyone including people with low risk should purchase ZDS.	It is not fair while some are purchasing ZDS, others are not.
Income Amount (Av. of Income Levels)	Insured	-.071	-.066
	Uninsured	.514	.509
Hierarchical World-view	Insured	.361(**)	.321(*)
	Uninsured	.515	.101
Individualistic World-view	Insured	.436(**)	.272(*)
	Uninsured	-.010	.045
Fatalisic World-view	Insured	.331(*)	.295(*)
	Uninsured	.248	.731(*)
Egalitarian World-view	Insured	.416(**)	.216
	Uninsured	.274	.523
Perceived Probability of Earthquake	Insured	-.456	-.018
	Uninsured	.506(**)	.408(**)
Perceived total loss to themselves	Insured	.540	.363
	Uninsured	.677(*)	.524

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed). Insured=1.00 Insured :Listwise N = 56 Uninsured :Listwise N = 11

Socio-Economic and Cultural Attributes of Households and Risk Perception: Judgements of both insured and un-insured Hhs about 'everyone including people with low risk should purchase ZDS' do not differ according to their income level significantly. Despite, high income level Hhs among insureds seem to disagree with inclusion of people at low risk into ZDS system, in contrast to insured at low income levels. Likewise, inverse relationship is observed between income level and agreement of insured Hhs with 'fairness of ZDS in the case of exclusions from ZDS purchase'. That is, insured Hhs in low income levels seem to agree with inclusion of everyone into ZDS system for preventing unfairness in the society. In contrast, un-insured Hhs in high income levels seem to agree with inclusion of low risk properties in ZDS system to prevent unfairness in the society. On the other hand, inclusion of everybody into ZDS system seem to be involved with hierarchical, individualistic, egalitarian and fatalistic world-views among insured Hhs. However, un-insured Hhs that agreed with

the unfairness of ZDS system in the case of exclusions from ZDS purchase seem to be more fatalistic than insured Hhs. Indeed, insured Hhs that agreed with inclusion of everybody into ZDS system and prevention of fairness due to exclusions seem to perceive earthquake probability higher. However, un-insured Hhs that agreed with these statements seem to perceive both probability of earthquake and losses from earthquake higher (Table 6.128).

In addition, Hh income level is found as not related to Hhs' evaluation of the policy option for risk-rated premiums. Indeed, un-insured Hhs, who think that ZDS premiums should not differ according to risk level, tend to have hierarchical world-view, whereas insured Hhs disagreed with risk-rated premiums seem to be individualistic. However, judgement for 'determination of premiums according to risk level can encourage households for risk mitigation' is involved with individualistic world-view among un-insured Hhs. On the other hand, there is observed an inverse relationhip between perceived controllability of earthquakes and agreement with 'risk-rated premiums can encourage homeowners to take RMMs', among un-insured Hhs. That is, although un-insured Hhs do not perceive earthquakes as controllable, they seem to deal with risk mitigation if homeowners are encouraged to take RMMs in terms of more expensive ZDS premiums (Table 6.129).

Table 6.129. Risk-based Premium Determination and Household Attributes

Spearman's rho Correlation Coefficient	ZDS Purchase	Annual insurance payments should not differ according to risk level.	ZDS premiums should differ according to risk level so that homeowners will be encouraged to minimize the possible risks.
Income Amount (Av. of Income Levels)	Insured	.042	.121
	Uninsured	.439	-.385
Hierarchical World-view	Insured	.074	-.051
	Uninsured	.679(*)	.261
Individualistic World-view	Insured	.268(*)	.041
	Uninsured	.254	.748(**)
Fatalisic World-view	Insured	.178	-.073
	Uninsured	.326	.210
Egalitarian World-view	Insured	.296(*)	.059
	Uninsured	-.130	-.085
Perceived Controllability of Earthquakes	Insured	-.116	.359
	Uninsured	-.177	-.284(*)
Perceived Probability of Earthquake	Insured	.046	-.236
	Uninsured	.096	.147
Perceived total loss to themselves	Insured	.429	-.256
	Uninsured	.399	.085

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured=1.00 Insured :Listwise N = 56 Uninsured :Listwise N = 11

Perceived Attributes of ZDS System: Perceived solidarity attribute of ZDS system is observed as related to agreement of un-insured Hhs with 'only those at high risk should be forced to purchase ZDS'. In contrast, there is an inverse relationship between perceived solidarity attribute of ZDS and this statement among insured Hhs. This difference indicates that insured and un-insured Hhs perceive solidarity in society in a different way. Likewise, insured Hhs perceive solidarity attribute of ZDS system, if 'everyone including people at low risk should purchase ZDS' (Table 6.130).

Table 6.130. Perceived Attributes of Current ZDS System and Inclusion of People into ZDS

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS as Compulsory	ZDS as Social Solidarity	Being confused
Only those with high risk should be forced to buy earthquake insurance.	Insured	-.151	-.165	-.199
	Uninsured	-.119	.445(*)	.128
Everyone including people with low risk should purchase ZDS.	Insured	.767(**)	.457(**)	.560(**)
	Uninsured	.810(**)	.271	.633(**)
It is not fair while some purchase ZDS, others do not	Insured	.581(**)	.442(**)	.527(**)
	Uninsured	.215	.288	.070
People at lower risk should pay lower premiums.	Insured	.002	.201	-.018
	Uninsured	-.195	.252	-.096
.Annual ZDS payments should not differ according to risk level.	Insured	.103	.097	.134
	Uninsured	.203	.602(**)	.402(*)
ZDS premiums should differ according to risk level so that homeowners will be encouraged to minimize earthquake risk	Insured	.077	.065	-.066
	Uninsured	-.085	-.385	-.118

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 95 and Uninsured :Listwise N = 26

In addition, agreement with 'inclusion of everyone into ZDS system' is found as related to perceived 'compulsory' purchase attribute of ZDS system among both insured and un-insured Hhs. That is, all Hhs in the survey seem to believe that inclusion of everyone into ZDS system can be achieved in terms of compulsory purchase of ZDS. This is also obvious in the agreement of insured Hhs with the possible unfairness that can arise from exclusions in ZDS purchase, because insured Hhs seem to perceive ZDS as a social solidarity mechanism. Therefore, exclusions from ZDS purchase appear to endanger the perception of social solidarity attribute of ZDS system. Despite, un-insured Hhs seem to think that they do not disrupt fairness in the society (Table 6.130). Moreover, perception of social solidarity attribute of ZDS system by un-insured Hhs seem to cause their disagreement with risk-rated premiums (Table 6.130).

Inclusion of Low-Income Homeowners into ZDS

With respect to inclusion of Hhs according to their income level, insured and un-insured Hhs do not differ in their disagreement with 'ZDS should be compulsory for high and moderate income homeowners' significantly. That is, they thought that ZDS purchase should be compulsory to all Hhs in all income levels. Despite, both insured and un-insured Hhs thought that 'it is not fair if low income families at high risk pay full price of ZDS'. Thus, all Hhs agreed with 'if annual ZDS premiums are determined according to risk level, it will not favour low income families'. Likewise, all Hhs also thought that the State should provide 'ZDS assistance' to low income families (Table 6.131).

Table 6.131. Policy Options involved with Household Income Level

	ZDS Purchase								
	Insured			Uninsured			Differences		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
ZDS should only be compulsory for high and moderate income homeowners.	2.4000	115	1.21972	2.6944	36	1.21466	1721.5	-1.608	.108
It is not fair that low income families at high risk pay full price of insurance.	3.4750	120	1.22962	3.7778	36	1.14919	1860	-1.301	.193
If the annual insurance payments are determined according to risk level, it will not favour low income families.	3.5776	116	1.25213	3.2432	37	1.32089	1830	-1.390	.164
State should provide insurance assistance to low income families.	3.9920	125	1.16741	3.8649	37	1.31576	2221.5	-.385	.700

However, insured Hhs thought that 'ZDS should be compulsory for high and moderate income homeowners', because they also thought 'if ZDS premiums are determined according to risk level, it will not favour low income families'. Indeed, implementing ZDS purchase compulsorily and determination of premiums according to risk level could not favour low income families at high risks. Thus, enforcing ZDS purchase to only high and moderate income homeowners could be a policy option in the case of implementing risk-rated premiums. On the other hand, according to un-insured Hhs' judgment, State-assistance could be offered to low income families, when enforcing high and moderate income homeowners to purchase ZDS. Indeed, offering State assistance to low income families seem to prevent the un-fairness that can arise from implementing risk-rated premiums, which is agreed by both insured and un-insured Hhs (Table 6.132).

Table 6.132. Policy Options involved with Income Level and Risk Degree

Spearman's rho Correlation Coefficient	ZDS Purchase	1	2	3	4
1) ZDS should only be compulsory for high and moderate income homeowners.	Insured	1.000			
	Uninsured	1.000			
2) It is not fair that low income families at high risk pay full price of insurance.	Insured	-.030	1.000		
	Uninsured	-.070	1.000		
3) If the annual insurance payments are determined concerning the risk level, it will not favour low income families.	Insured	.242(*)	.450(**)	1.000	
	Uninsured	-.181	.079	1.000	
4) State should provide insurance assistance to the low income families.	Insured	.109	.522(**)	.535(**)	1.000
	Uninsured	.374(*)	.036	.077	1.000

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 95; Uninsured :Listwise N = 31

Inclusion of Un-authorized Houses into ZDS

Both insured and un-insured Hhs agreed with that 'unlicenced buildings should also be comprised to ZDS system'. Despite, insured Hhs disagreed with that 'owners of illegal and unlicenced buildings are low income families', while un-insured Hhs agreed with this judgement. However, all Hhs agreed with that 'ZDS premiums of unlicenced buildings should be more expensive than others' (Table 6.133).

Table 6.133. Policy Options for Inclusion of Un-licenced Buildings into ZDS System

	ZDS Purchase								
	Insured			Uninsured			Differences		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
Unlicenced buildings should also be comprised to insurance coverage.	3.488	125	1.5586	3.324	37	1.5820	2187.5	-.518	.604
Owners of illegal and unlicences buildings are low income families.	2.771	118	1.4465	3.243	37	1.3825	1777	-1.747	.081
Insurance premiums of unlicenced buildings should be higher than others.	3.597	119	1.4339	3.811	37	1.3710	2037	-.717	474

In addition, insured Hhs seem to perceive earthquake risk of unlicenced buildings more than other houses, because they agreed with offering more expensive premiums to unlicenced buildings, when they also agreed with offering lower premiums to lower risk properties. On the other hand, insured Hhs that agreed to offering expensive premiums to unlicenced buildings also agreed with implementation of risk-rated premiums to encourage risk mitigation. That is, implementing risk-rated premiums can also encourage owners of unlicenced houses to take risk mitigation measures, when they can be

included into ZDS system in this way. Despite, owners of unlicenced buildings could be low income families, which can prevent the decision to implement risk-rated premiums, as observed in judgements of insured Hhs (Table 6.134).

Table 6.134. Policy Options for Risk-based Premiums and Unlicenced Buildings

Spearman's rho Correlation Coefficient	Being Insured	Insurance premiums of unlicenced buildings should be higher than the others.	Owners of illegal and unlicences buildings are low income families.
People at lower risk should pay lower premiums.	Insured	.412(**)	.094
	Uninsured	.305	.217
The annual insurance payments should not change concerning the risk level.	Insured	.086	.194(*)
	Uninsured	.078	.187
Insurance premiums should differ according to risk so that homeowners will be encouraged to minimize the possible risks.	Insured	.233(*)	.133
	Uninsured	.379(*)	-.048

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 104; Uninsured :Listwise N = 34

In the same way, insured Hhs that thought 'owners of unlicenced houses are low income families', thought also that these families cannot pay full price of ZDS premiums in the case of determining premiums according to risk level. In this case, State assistance to low income families for paying ZDS premiums seems to be another policy option according to judgements of insured Hhs. Therefore, the unfairness that arise from expensive premiums due to high earthquake risk in the unlicenced housing stock seems to be prevented in terms of State assistance for ZDS premiums to low income families (Table 6.135).

Table 6.135. Policy Options to Prevent Unfairness in Un-authorized Housing Stock

Spearman's rho Correlation Coefficient	ZDS Purchase	Insurance premiums of unlicenced buildings should be higher than the others.	Owners of illegal and unlicences buildings are low income families.
It is not fair that low income families at high risk pay full price of insurance.	Insured	.152	.247(*)
	Uninsured	.133	.142
If the annual insurance payments are determined concerning the risk level, it will not be in favour of low income families.	Insured	-.014	.327(**)
	Uninsured	.233	.153
State should provide insurance assistance to the low income families.	Insured	-.006	.377(**)
	Uninsured	-.132	.155

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 87, Uninsured :Listwise N = 31

6.2.3. Contribution of ZDS to Risk Reduction

In the field survey, both insured and un-insured Hhs agreed with the policy options related to contribution of ZDS into risk reduction. Accordingly, certification of retrofitted buildings by the ZDS system can encourage people to take RMMs' for both insured and un-insured Hhs. In addition, offering technical assistance to the buildings that renew their ZDS contracts each year is prefered by both insured and un-insured Hhs. In the same way, both insured and un-insured Hhs are willing to be offerred discounts in ZDS premiums in the case of retrofitting their buildings. Despite, insured Hhs agreed with 'giving priority for retrofitting to the homeowners that purchase ZDS each year' more than un-insured Hhs. Likewise, insured Hhs agreed with 'the buildings that renew their ZDS contract should have priority to get credits from banks and/or State for retrofitting' more than un-insured Hhs. Indeed, un-insured Hhs appear to object the priorities for risk mitigation according to ZDS purchase. This difference can arise from the willingness of insured Hhs to purchase ZDS in contrast to un-insured Hhs. In addition, insured Hhs seem to be more willing to be rewarded for their ZDS purchase behavior, in contrast to un-insured Hhs (Table 6.136).

Table 6.136. Contribution of ZDS to Households for Taking RMMs in the Building

	ZDS Purchase								
	Insured			Uninsured			Differences		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
Insurance system should encourage people to take mitigation measures by giving certificate to the retrofitted houses.	4.4211	114	.94910	4.2308	39	1.03775	1941	-1.343	.179
The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality.	4.4252	127	.81181	4.0588	34	1.09934	1749.5	-1.892	.058
The buildings that renew their insurance policies each year should have priority for retrofitting.	4.5354	127	.72150	3.9118	34	1.05508	1391	-3.590	.000
The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	4.3440	125	.77360	3.8000	35	1.07922	1554.5	-2.827	.005
The retrofitted buildings should be offerred discounts in ZDS premiums	4.3360	125	.87015	4.0286	35	1.04278	1816.5	-1.688	.091

In addition, both insured and un-insured Hhs that agreed with certification of buildings in the case of retroffiting seem to be in need of technical assistance from municipalities. Indeed, both insured and un-insured Hhs appear to renew their ZDS contracts each year in the case of they are offered technical assistance from municipalities for retrofitting. Therefore, un-insured Hhs seem to be also

convinced for the priority of homeowners that purchase ZDS regularly. Another policy option, i.e. offering discounted ZDS premiums to retrofitted buildings seem to convince both insured and un-insured Hhs for both retrofitting their building and for purchasing ZDS, if their buildings can be certified by municipalities and if they are offered technical assistance by municipalities. In addition, having priority for risk mitigation credits seem to be another policy option that can convince both insured and un-insured Hhs for risk mitigation and ZDS purchase (Table 6.137).

Table 6.137. Correlations between Policy Options for Contribution of ZDS into Risk Mitigation

Spearman's rho Correlation Coefficient	ZDS Purchase	1	2	3	4	5
1) Insurance system should encourage people to take mitigation measures by giving certificate to retrofitted houses.	Insured	1.000				
	Uninsured	1.000				
2) The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality.	Insured	.218(*)	1.000			
	Uninsured	.375(*)	1.000			
3) The buildings that renew their insurance policies each year should have priority for retrofitting.	Insured	.193	.821(**)	1.000		
	Uninsured	.413(*)	.859(**)	1.000		
4) The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	Insured	.132	.620(**)	.720(**)	1.000	
	Uninsured	.273	.722(**)	.887(**)	1.000	
5) The retrofitted buildings should be offerred discounts in ZDS premiums	Insured	.091	.510(**)	.635(**)	.577(**)	1.000
	Uninsured	.488(**)	.710(**)	.729(**)	.798(**)	1.000

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 102; Uninsured :Listwise N = 32

'Contribution of ZDS into Risk Mitigation' and 'Compulsory' Implementation of ZDS': In the case of implementing ZDS purchase compulsorily, insured Hhs seem to tend the policy options related with the contribution of ZDS system into risk mitigation. Despite, un-insured Hhs appear to agree with the implementation of ZDS in terms of effective punishments, if the retrofitted buildings are offered discounted ZDS premiums. In addition, discounted ZDS premiums seem to encourage both insured and and un-insured Hhs, if all units in the buildings are enforced to purchase ZDS instead of individual housing units (Table 6.138).

Table 6.138. 'Contribution of ZDS into Risk Mitigation' and 'Compulsory' Implementation of ZDS'

Spearman's rho Correlation Coefficient	ZDS Purchase	There should be enacted an "earthquake insurance law" that include effective punishments.	To oblige the ZDS, people without insurance should be imposed effective punishments.	To prepare the society against earthquake, ZDS should be obligatory.	ZDS should be compulsory for the buildings instead of the housing units in the buildings.	There should be monetary punishment for uninsureds.
Insurance system should encourage people to take mitigation measures by giving certificate to the retrofitted houses.	Insured	.029	.170	.213(*)	.075	.192
	Uninsured	.095	.170	.334	.291	-.026
The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality.	Insured	.261(*)	.325(**)	.414(**)	.350(**)	.203(*)
	Uninsured	.177	-.091	.134	.126	-.055
The buildings that renew their insurance policies each year should have priority for retrofitting.	Insured	.284(**)	.311(**)	.505(**)	.524(**)	.235(*)
	Uninsured	.144	-.083	.137	.083	-.036
The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	Insured	.348(**)	.353(**)	.487(**)	.485(**)	.269(**)
	Uninsured	.321	.007	.321	.258	.140
The retrofitted buildings should be offerred discounts in ZDS premiums	Insured	.094	.085	.200	.364(**)	-.085
	Uninsured	.385(*)	.043	.397(*)	.453(*)	.143

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 94; Uninsured :Listwise N = 30

'Contribution of ZDS into Risk Mitigation' and 'Implementing ZDS through Taxations': Insured Hhs that agreed with implementing ZDS through certain taxation systems tend to agree contribution of ZDS into risk mitigation, in general. However, both insured and un-insured Hhs that agreed with reflection of ZDS premiums into property tax, also agreed with 'getting priority for retrofitting credits from banks or State'. That is, the contribution of ZDS system into risk mitigation in terms of linking ZDS premiums into risk mitigation credits seem to increase both risk mitigation and ZDS purchase by both insured and un-insured Hhs (Table 6.139).

In addition, both insured and un-insured Hhs that agreed with "declaration of a national state of war for ZDS" also agreed with some priorities for retrofitting in the case of regular ZDS purchase. These priorities are for the "technical assistance from municipalities for retrofitting", "priority for retrofitting" and "priority to get banking credits". This finding indicates that risk mitigation activities and ZDS purchase can be increased in terms of giving priorities to homeowners for certain risk mitigation opportunities, which require the cooperation of ZDS system with banks, State and local administrations (Table 6.139).

Moreover, implementing “discounts in ZDS premiums to retrofitted buildings” and “reflection of ZDS premiums into property-tax” seem to convince both insured and un-insured Hhs to purchase ZDS and to retrofit their buildings (Table 6.139).

‘Contribution of ZDS into Risk Mitigation’ and ‘Implementing ZDS through Incentives’: Un-insured Hhs tend to voluntary purchase of ZDS and priority for technical assistance and risk mitigation in the building more than insured Hhs. Despite, they do not tend to ‘persuasion of people to purchase ZDS voluntarily’. That is, un-insured Hhs seem not to purchase ZDS and take risk mitigation measures in the case of leaving ZDS purchase completely voluntary conditions. On the other hand, insured Hhs tend the persuasion of peopple to purchase ZDS, when they also tend the priorities that can be given for risk mitigation such as technical assistance by municipalities and credits by banks and the State. However, they do not agree with completely voluntary purchase of ZDS. However, both insured and un-insured Hhs seem to be convinced in terms of offering discounted ZDS premiums for retrofitted buildings, which seem to encourage purchase of ZDS by people voluntarily (Table 6.140).

Despite, certification of retrofitted buildings can be another policy option, if the buildings that renew their ZDS contracts can also be offered premium discounts. Indeed, using premium discounts to encourage risk mitigation activities seem to be possible in terms of linking ZDS system to offering priorities such as technical assistance, bank and State credits for risk mitigations. Therefore, the ZDS system can offer premium reductions for both regular ZDS purchase and risk mitigation activities. In addition, searching out the ways to link premiums, i.e. ZDS contracts, into risk mitigation and technical assistance of municipalities and risk mitigation credits seem to be necessary (Table 6.140).

On the other hand, another way to encourage risk mitigation seems to be offering discounted housing tax according to regular ZDS purchase, when linking propert tax and/ or ZDS contracts into risk mitigation activities and priorities (Table 6.140).

Table 6.139. 'Contribution of ZDS into Risk Mitigation' and 'Implementing ZDS through Taxations'

Spearman's rho Correlation Coefficient	ZDS Purchase	A national state of war for ZDS should be declared.	ZDS should be thought as a tax for earthquake.	ZDS can be reflected to the property-house tax.	ZDS premiums can be reflected to other running costs such as electricity, water, etc.	ZDS should be required during the payment of electricity, water and natural gas, etc.
ZDS system should encourage people to take mitigation measures by giving certificate to the retrofitted houses.	Insured	.238(*)	.163	-.012	-.032	.083
	Uninsured	.155	.073	.353	.243	.193
The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality	Insured	.335(**)	.428(**)	.233(*)	.219(*)	.172
	Uninsured	.406(*)	.097	.322	.152	.142
The buildings that renew their insurance policies each year should have priority for retrofitting.	Insured	.317(**)	.346(**)	.258(*)	.259(*)	.186
	Uninsured	.374(*)	.170	.364	.108	.139
The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	Insured	.265(**)	.347(**)	.326(**)	.296(**)	.221(*)
	Uninsured	.458(*)	.354	.423(*)	.209	.278
The retrofitted buildings should be offerred discounts in ZDS premiums	Insured	.315(**)	.205(*)	.081	.237(*)	-.021
	Uninsured	.267	.423(*)	.437(*)	.234	.272

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Insured :Listwise N = 98 and Uninsured :Listwise N = 29

Table 6.140. 'Contribution of ZDS into Risk Mitigation' and 'Implementing ZDS through Incentives'

Spearman's rho Correlation Coefficient	ZDS Purchase	Earthquake insurance should be bought completely voluntarily	People should be encouraged and persuaded to buy ZDS.	If all houses in a building are insured, this building should be offerred a certificate each year.	Buildings that renew their ZDS contracts each year should be offerred premium discount.	Buildings that renew their ZDS contracts each year should be offerred discount in housing tax.
ZDS system should encourage people to take mitigation measures by giving certificate to the retrofitted houses.	Insured	.099	.085	.308(**)	.317(**)	.082
	Uninsured	.196	.353	.334	.542(**)	.398(*)
The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality.	Insured	.104	.465(**)	.507(**)	.769(**)	.490(**)
	Uninsured	.417(*)	.125	.361(*)	.613(**)	.784(**)
The buildings that renew their insurance policies each year should have priority for retrofitting.	Insured	.062	.531(**)	.569(**)	.752(**)	.612(**)
	Uninsured	.405(*)	.275	.431(*)	.622(**)	.878(**)
The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	Insured	.021	.508(**)	.522(**)	.616(**)	.491(**)
	Uninsured	.288	.310	.518(**)	.586(**)	.759(**)
The retrofitted buildings should be offerred discounts in ZDS premiums	Insured	.105	.401(**)	.447(**)	.562(**)	.584(**)
	Uninsured	.265	.366(*)	.580(**)	.770(**)	.637(**)

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 89 and Uninsured :Listwise N = 31

Risk Mitigation through FOL's new regulations

In the case of enforcing homeowners to take risk mitigation measures in the building through Flat Ownership Law (FOL), both insured and un-insured Hhs have declared that 'majority will appeal to court for this situation'. Despite, insured Hhs disagreed with the appeal of majority to court, in countrast to un-insured Hhs. Indeed, insured Hhs seem to be more willing to obey risk mitigation decisions without any appeal. Likewise, they also seem to accede to leave their house for 3 or 6 months during risk mitigation operations, in contrast to un-insured Hhs. In addition, insured Hhs tend to prefer the safiest retroffitting operation, although it can be most expensive one. In contrast, un-insured Hhs tend to prefer the cheapest alternative among various retrofitting operations. In other words, un-insured Hhs seem to have financial difficulties, if they are forced to take expensive risk mitigation measures and if they are forced to leave their home during risk mitigation operations. Despite, both insured and un-insured Hhs do not want to sell their estate and move to another place under this compulsion (Table 6.141).

Table 6.141. Tendency for New Regulation of FOL for Risk Mitigation in the Building

	ZDS Purchase								
	Insured			Uninsured			Differences		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	Z	p
The majority will appeal to court for this situation.	3.0762	105	1.14937	3.4545	33	1.20133	1404.5	-1.689	.091
I will obey to the decisions without any appeal.	4.0566	106	.93432	3.5588	34	1.15971	1358	-2.275	.023
I can accede to leave here for 3-6 monts during these operations.	3.2596	104	1.26180	2.8235	34	1.14072	1390.5	-1.918	.055
I prefer the cheapest one of the retrofitting operations.	2.6538	104	1.22885	3.1515	33	1.17583	1321.5	-2.042	.041
I prefer the safiest one of the retrofitting operations even it is the most expensive one.	4.0094	106	.89969	3.6875	32	1.11984	1454	-1.283	.199
I will sell my estate and move to anoter place under this compulsion.	2.6132	106	1.10902	2.3333	33	1.13652	1491	-1.326	.185
Under this compulsion, there should be an exemption from real estate taxes at least for 10 years.	3.6275	102	1.12507	3.3939	33	1.08799	1454	-1.215	.224

In spite of possible financial difficulties, un-insured Hhs seem to be less convinced with the exemption from property tax for 10 years in the case of such a risk mitigation compulsion in the building (Table 6.141).

Table 6.142. Which one is bearable to retrofitt the building?

		ZDS Purchase		Total
		Insured	Uninsured	
It is bearable without any equivalent.	Count	12	3	15
	% within Being Insured	10.3%	9.7%	10.1%
	% of Total	8.1%	2.0%	10.1%
In the case of getting a retrofitting certificate.	Count	26	7	33
	% within Being Insured	22.2%	22.6%	22.3%
	% of Total	17.6%	4.7%	22.3%
In the case of discounted insurance premiums.	Count	6	1	7
	% within Being Insured	5.1%	3.2%	4.7%
	% of Total	4.1%	.7%	4.7%
In the case of discounted real estate tax for 5 years	Count	4	4	8
	% within Being Insured	3.4%	12.9%	5.4%
	% of Total	2.7%	2.7%	5.4%
In the case 50% rent assistance	Count	69	16	85
	% within Being Insured	59.0%	51.6%	57.4%
	% of Total	46.6%	10.8%	57.4%
Total	*Count*	*117*	*31*	*148*
	% within Being Insured	*100.0%*	*100.0%*	*100.0%*
	% of Total	*79.1%*	*20.9%*	*100.0%*

In addition, insured Hhs seem to be more willing to take risk mitigation in the cause of enforcement through FOL, because they seem to be convinced without being offerred with something. Despite, the most convincing way for such a risk mitigation enforcement seems to be 50% rent assistance during risk mitigation in the building, for both insured and un-insured Hhs. Another way appears to be offering a retrofitting certificate for risk mitigation. However, discounted ZDS premiums and real estate tax seem not to force both insured and un-insured Hhs to risk mitigation. Despite, discounted property tax for 5 years can convince some un-insured Hhs, whereas premium discounts can influence some insued Hhs (Table 6.142).

Contribution of ZDS into Risk Reduction in terms of Local Administrations

In the field survey, both insured and un-insured Hhs agreed with the policy options related to contribution of ZDS into risk reduction in terms of local administrations. Firstly, they agreed with 'aggregated ZDS payments shouldn't be used only after earthquakes, but also before earthquakes to retrofit existing buildings'. Although un-insured Hhs tend to more agree with 'aggregated ZDS payments should be used to provide credits to municipalities for retrofitting'. Indeed, insured Hhs agreed with 'municipalities should get credits from ZDS according to their efforts and success in risk reduction' more than un-insured Hhs. However, un-insured Hhs agreed with ' a certain amount of aggregated ZDS premiums should be used to reduce earthquake risk in schools, hospitals and other infrastructure systems' more than insured Hhs. Despite, there is observed no significant difference the judgments of insured and un-insured Hhs (Table 6.143) .

Table 6.143. Contribution of ZDS System into Risk Reduction in Turkey according to ZDS Purchase Behaviour

	ZDS Purchase								
	Insured			Uninsured			Differences		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
Aggregated ZDS payments should be used in Turkey for risk reduction investments.	4.1652	115	.9727	3.9474	38	1.1137	1945	-1.088	.277
Aggregated ZDS payments should not only be used after earthquakes, but also before earthquakes to retrofit the present insured buildings.	4.0862	116	1.1983	4.0000	37	1.1055	1921	-1.033	.302
Aggregated ZDS payments should be used to provide credits to the municipalities for retroffiting.	3.3504	117	1.4039	3.4211	38	1.4071	2172	-.218	.828
Municipalities should get credits from insurance according to their efforts and success in risk reduction.	3.8017	116	1.2386	3.4324	37	1.4051	1811	-1.490	.136
A certain amount of aggreted premium resources should be transferred to another fund to be used to reduce te risks of school, hospital and other infrastructure sytems.	3.6525	118	1.3548	3.8108	37	1.1014	2133	-.218	.827

Socio-Economic Attributes of Households: According to findings, agreement with offering risk reduction opportunities and contribution of ZDS to these opportunities do not differ according to socio-economic attributes of both insured and un-insured Hhs. Despite, insured Hhs at higher education and income levels seem not to in need of technical assistance of municipality to retrofit their buildings in the case of their regular ZDS purchase, in contrast to insured Hhs at lower education and income levels. Insured Hhs in higher education and income levels also seem to disagree with getting priority for retrofitting, if they purchase ZDS regularly, when they appear to disagree with premium discounts in ZDS contracts (Table 6.144). Likewise, un-insured Hhs at higher income levels seem to disagree with technical assistance other priorities for risk mitigation. Indeed, these differences appear to be not significant. Despite, these differences can indicate that both insured and un-insured Hhs at higher income levels seem to perceive themselves and their houses safer, when they do not need risk mitigation. They can perceive themselves as not in need of priorities for risk mitigation credits and technical assistance in comparison with other Hhs in lower income levels. On the other hand, this finding can indicate that both insured and un-insured Hhs in lower education and income levels could be in need of technical assistance for retrofitting, priority for retrofitting and priority for bank and State credits for risk mitigation. These Hhs also seem to be encouraged for retrofitting in terms of discounted ZDS premiums (Table 6.144).

Table 6.144. Risk Reduction and Contribution of ZDS According to Attributes of Households

Spearman's rho Correlation Coefficient	ZDS Purchase	Head's Age	HH-Head Education	Income Amount (Av. of Income Levels)
The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality.	Insured	.093	-.128	-.192
	Uninsured	-.005	.252	-.283
The buildings that renew their insurance policies each year should have priority for retrofitting	Insured	.118	-.069	-.103
	Uninsured	.086	.152	-.314
The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	Insured	.188	.034	.009
	Uninsured	.147	.166	-.328
The retrofitted buildings should be offerred discounts in ZDS premiums	Insured	.154	-.010	-.103
	Uninsured	-.117	.045	-.267

Insured: Listwise N = 104; Uninsured: Listwise N = 26

Socio-cultural Attributes of Households: Tendency of insured Hhs to these policy options are found as related to all world-views significantly, except 'fatalistic' world-view. In addition, an inverse relationship is observed among un-insured Hhs between agreement with priorities and discounted ZDS premiums for retrofitting and 'fatalistic world-view'. This finding can indicate that these policy options can encourage insured Hhs with all world-views and un-insured Hhs without fatalistic world-view to participate into risk mitigation and ZDS purchase. Besides, implementing these policy options seem to decrease the fatalistic world-view in the society, particularly among un-insured Hhs (Table 6.145).

Table 6.145. Risk Reduction, Contribution of ZDS and World-views of Households

Spearman's rho Correlation Coefficient	ZDS Purchase	Hierarchical World-view	Individualistic World-view	Fatalistic World-view	Egalitarian World-view
The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality.	Insured	.300(**)	.373(**)	.130	.305(**)
	Uninsured	.164	.106	-.299	.197
The buildings that renew their insurance policies each year should have priority for retrofitting	Insured	.329(**)	.329(**)	.094	.395(**)
	Uninsured	.127	.160	-.312	.119
The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	Insured	.285(**)	.266(**)	.085	.369(**)
	Uninsured	.058	.265	-.082	.119
The retrofitted buildings should be offerred discounts in ZDS premiums	Insured	.247(*)	.309(**)	.127	.159
	Uninsured	-.006	.163	.004	.063

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 93 and Uninsured :Listwise N = 21

Perception of Earthquake Risk: Insured Hhs, who tend to policy options involved with 'technical assistance of municipalities and priority for retrofitting in the case of their regular ZDS purchase', seem to perceive more losses to themselves and higher earthquake risk, when they also perceive earthquakes more controllable. In addition, their agreement with priority for bank and State risk mitigation credits and discounted ZDS premiums for risk mitigation are found as related to their perceived controllability of earthquakes and perceived total losses to themselves. In contrast, un-insured Hhs, who perceive higher probability of earthquake seem to apply for risk mitigation credits. Indeed, tendency of un-insured Hhs to these policy options seem to be inversely related to perceived controllability of earthquakes and perceived total losses.

Table 6.146. Perceived Earthquake Risk and Tendency to 'Contribution of ZDS into Risk Mitigation'

Spearman's rho Correlation Coefficient	ZDS Purchase	Perceived Controllability of Earthquakes	perceived probability	perceived total loss to themselves	Perceived risk
The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality.	Insured	.344(**)	.137	.493(**)	.309(**)
	Uninsured	-.050	.107	-.047	.032
The buildings that renew their insurance policies each year should have priority for retrofitting	Insured	.365(**)	.111	.474(**)	.278(*)
	Uninsured	-.128	.263	-.127	.167
The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	Insured	.295(**)	-.139	.367(**)	.026
	Uninsured	-.264	.447(*)	-.107	.368
The retrofitted buildings should be offerred discounts in ZDS premiums	Insured	.272(*)	.007	.269(*)	.105
	Uninsured	-.194	.288	-.035	.252

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed). Insured :Listwise N = 83 and Uninsured :Listwise N = 22

In other words, the un-insured Hhs seem not to participate to these risk mitigation policies that can be offered by ZDS because of their lower perception of losses and controllability of earthquakes (Table 6.146). These findings can indicate that ZDS can contribute to risk mitigation in terms of providing the opportunities such as technical assistance of municipalities, priority for retrofitting and risk mitigation credits and discounted ZDS premiums. However, if the people are left to their individual decisions, they can fail to take these measures because of their lower perception of risk. Therefore, if the earthquake risk is very high, leaving risk mitigation decisions into voluntary conditions in terms of providing opportunities to encourage homeowners can be insufficient (Table 6.146).

Table 6.147. 'Contribution of ZDS into Risk Mitigation' and Perceived Attributes of Current ZDS System

Spearman's rho Correlation Coefficient	ZDS Purchase	Perceiving ZDS As Compulsory	Perceiving ZDS as Social Solidarity Mechanism
The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality.	Insured	.391(**)	.250(**)
	Uninsured	.057	.302
The buildings that renew their insurance policies each year should have priority for retrofitting	Insured	.446(**)	.277(**)
	Uninsured	-.017	.324
The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	Insured	.444(**)	.333(**)
	Uninsured	.067	.396(*)
The retrofitted buildings should be offerred discounts in ZDS premiums	Insured	.285(**)	.338(**)
	Uninsured	.146	.274

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured: Listwise N = 115 and Uninsured: Listwise N = 30

Perceived Attributes of ZDS System: Perceiving purchase of ZDS as compulsory in the existing ZDS system and perceiving the ZDS system as a social solidairy mechanism are found as related to the tendencies of insured Hhs toward contribution of ZDS into risk mitigation in terms of offering technical assistance by municipalities, priority for retrofitting, priority for risk mitigation credits and discounted ZDS premiums. In addition, peceiving ZDS system as a social solidarity mechanism is observed as related to tendencies of un-insured for 'priority for retrofitting credits'. These findings can indicate that implementing ZDS system as compulsory can increase participation of Hhs into risk mitigation that are offered by ZDS system in cooperation with local administrations, banks and State. In addition, offering these policies, particularly bank or State credits for risk mitigation, can encourage especially un-insured Hhs by changing their perceived solidarity attribute of ZDS system (Table 6.147).

6.2.4. Post-disaster Policies, Expectation of State-aid and ZDS System

Tendencies of Hhs to policy options could be influenced by their State-aid expectation. Indeed, insured Hhs have also declared their observation about the reason of declining ZDS purchase by un-insured Hhs as their expectation of State-aid. Although un-insured Hhs also agree with this statement, they were uncertain about their State-aid expectation. Despite, both insured and un-insured Hhs thought that nobody will purchase ZDS and everybody will expect State-aid, if ZDS purchase is not made compulsory. That is, un-insured Hhs also agreed that people expect State-aid instead of purchasing ZDS as soon as ZDS is not implemented as compulsory. Although un-insured Hhs do not explain their State-aid expectation explicitly, their disagreement with 'State shouldn't assist for housing to un-insured Hhs' can indicate that their State-aid expectation, indirectly (Table 6.148).

Table 6.148. Compulsory Purchase of ZDS and Expectation of State-aid

	ZDS Purchase								
	Insured Hhs			Uninsured Hhs			Difference		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	z	p
People do not buy ZDS, because they know the State will assist after an earthquake.	3.8814	118	1.126	3.2105	38	1.3786	1606	-2.761	.006
If ZDS is not made compulsory, nobody will buy ZDS and after an earthquake, everybody will expect State aid.	4.2250	120	.9655	3.7568	37	1.1403	1683	-2.384	.017
State shouldn't assist for housing to un-insureds Hhs.	3.3419	117	1.340	2.8235	34	1.4028	1569	-1.916	.055

Table 6.149. Expectation of State aid and Compulsory Purchase of ZDS

Spearman's rho Correlation Coefficient	ZDS Purchase	If ZDS is not made compulsory, nobody will buy ZDS and after an earthquake, everybody will expect State aid.	People do not buy ZDS, because they know the State will assist after an earthquake.	State shouldn't assist for housing to the uninsureds.
There should be enacted an "earthquake insurance law" that include effective punishments.	Insured	.496(**)	.117	.488(**)
	Uninsured	.565(**)	.120	.494(**)
To oblige the earthquake insurance, the people without insurance should be imposed effective punishments.	Insured	.461(**)	.176	.543(**)
	Uninsured	.371(*)	.083	.342
To prepare the society against earthquake, earthquake insurance should be obligatory.	Insured	.581(**)	.205(*)	.350(**)
	Uninsured	.512(**)	.143	.696(**)
Earthquake insurance should be compulsory for the buildings instead of the housing units in the buildings.	Insured	.613(**)	.311(**)	.412(**)
	Uninsured	.462(**)	-.066	.404(*)
There should be monetary punishment for uninsureds.	Insured	.281(**)	.190	.653(**)
	Uninsured	.231	.240	.594(**)
There should be imprisoning for uninsureds.	Insured	.260(*)	.008	.534(**)
	Uninsured	.160	.330	.505(**)

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 93 and Uninsured :Listwise N = 31

On the other hand, insured Hhs seem to agree with effective punishment, because they think that un-insured Hhs expect State-aid and State should not offer housing assistance to un-insureds. In the same way, un-insured Hhs agreed with 'effective punishments' and 'compulsory' implementation of ZDS can prevent expectation of State-aid. In addition, both insured and un-insured Hhs agreed with different ways of compulsory implementation of ZDS including monetary punishments tend to disagree with housing assistance of State-aid to the un-insured Hhs (Table 6.149).

Besides, insured Hhs seem to agreed with 'a national state of war for ZDS should be declared', because 'everybody expects State-aid as soon as ZDS is not implemented as compulsory'. For a national state of war for ZDS, insured Hhs also seem to think that 'State shouldn't offer housing assistance to un-insured Hhs'. To prevent State-assistance, insured Hhs seem to think that 'ZDS should be implemented as an 'earthquake tax' or 'property tax' as well as 'ZDS premiums can be reflected to other compulsory payments', etc. In the same way, un-insured Hhs seem to agree with that 'reflecting ZDS into property tax' and into 'other compulsory payments' can prevent housing assisting of State to un-insureds (Table 6.150).

Table 6.150. Policy Options for ZDS as Taxation System and Expectation of State-aid

Spearman's rho Correlation Coefficient	ZDS Purchase	If ZDS is not compulsory, nobody will buy ZDS and everybody will expect State aid.	People do not buy ZDS, because they know State will assist in the case of a disaster.	State shouldn't assist for housing to the uninsureds.
A national state of war should be declared for ZDS.	Insured	.302(**)	.143	.378(**)
	Uninsured	.342	.381(*)	.545(**)
ZDS should be thought as a tax for earthquake.	Insured	.440(**)	.067	.258(*)
	Uninsured	.487(**)	-.079	.416(*)
ZDS can be reflected to the property-house tax.	Insured	.384(**)	.049	.196
	Uninsured	.329	.104	.432(*)
ZDS premiums can be reflected to other obligatory payments such as electricity, water, telephone.	Insured	.540(**)	.167	.316(**)
	Uninsured	.564(**)	.140	.440(*)
ZDS policy should be required during the payment of electricity, water and natural gases invoices.	Insured	.294(**)	.248(*)	.639(**)
	Uninsured	.478(**)	.212	.585(**)

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 93 and Uninsured :Listwise N = 29

Moreover, both insured and un-insured Hhs seem to agree with that people should be encouraged and persuaded to purchase ZDS voluntarily, because they think that implementing ZDS not compulsorily causes expectation of State-aid. However, they seem not to agree with that voluntary implementation of ZDS can prevent expectation of State-aid by un-insured Hhs. In addition, un-insured Hhs seem to agree with that housing assistance of State to un-insured Hhs can be prevented by encouraging people to purchase ZDS voluntarily as well as by giving ZDS into private sector as independent from State (Table 6.151). However, both insured and un-insured Hhs was found as not tending to implement ZDS as completely voluntary and as independent from State.

Table 6.151. Voluntary Implementation of ZDS and Expectation of State-aid

Spearman's rho Correlation Coefficient	ZDS Purchase	If ZDS is not compulsory, nobody will buy ZDS and after an earthquake, everybody will expect State aid.	People do not buy ZDS, because they know the government will assist in the case of a disaster.	State shouldn't assist for housing to the uninsureds.
ZDS should be bought completely voluntarily	Insured	-.061	.028	-.160
	Uninsured	.031	-.083	-.034
People should be encouraged and persuaded to buy ZDS voluntarily.	Insured	.619(**)	.196	.178
	Uninsured	.368(*)	-.172	.469(**)
ZDS should be given to private sector as independent from State.	Insured	.042	.149	-.075
	Uninsured	-.007	.084	.368(*)

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 89; Uninsured :Listwise N = 33

In addition, both insured and un-insured Hhs seem to agree with using 'certification of buildings', 'discounted ZDS premiums' and 'discounted property taxes' to prevent State-expectation of people. Moreover, insured Hhs seem to think that discounted property tax can be another solution to prevent State-aid expectation. On the other hand, un-insured Hhs seem to believe that 'certification of buildings' can also prevent State-aid expectation (Table 6.152).

Table 6.152. ZDS Incentives and State-aid Expectations

Spearman's rho Correlation Coefficient	ZDS Purchase	If all homeowners in a building are insured, this building should be offerred a certificate each year.	The buildings that renew their insurance policies each year should be offerred premium discount.	The buildings that renew their insurance policies each year should be offerred discount in housing tax.
If ZDS is not compulsory, nobody will buy ZDS and after an earthquake, everybody will expect State aid.	Insured	.512(**)	.372(**)	.295(**)
	Uninsured	.605(**)	.489(**)	.378(*)
People do not buy ZDS, because they know the government will assist in the case of a disaster.	Insured	.306(**)	.170	.191
	Uninsured	-.017	-.212	-.069
State shouldn't assist for housing to the uninsureds.	Insured	.415(**)	.149	.208(*)
	Uninsured	.637(**)	.088	.011

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 97; Uninsured :Listwise N = 32

Moreover, both insured and un-insured Hhs seem to believe that prevention of State assistance can be achieved through inclusion or participation of everyone into ZDS system. On the other hand, un-insured Hhs appear to believe that flat-rated premiums with compulsory purchase can be used to prevent State-aid expectation. In contrast, insured Hhs seem to believe that risk-rated premiums can prevent State-assistance in terms of encuraging into risk mitigation and therefore inclusion of everybody into ZDS system (Table 6.153).

Table 6.153. State-aid expectation and Risk-based Premium Determination

Spearman's rho Correlation Coefficient	Being Insured	If the earthquake insurance is not compulsory, nobody will buy insurance and after an earthquake, everybody will expect State aid.	People do not buy earthquake insurance, because they know the government will assist in the case of a disaster.	State shouldn't assist for housing to the uninsureds.
Everyone including people with low risk should purchase earthquake insurance.	Insured	.552(**)	.244(*)	.378(**)
	Uninsured	.550(**)	.025	.556(**)
It is not fair while some are purchasing insurance, others are not.	Insured	.501(**)	.302(**)	.442(**)
	Uninsured	.435(*)	-.332	.187
The annual insurance payments should not change concerning the risk level.	Insured	.118	-.073	.020
	Uninsured	.711(**)	-.073	.277
Insurance premiums should differ in respect of risk so that homeowners will be encouraged to minimize the possible risks.	Insured	.084	-.060	.211(*)
	Uninsured	-.262	.279	.055

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 96; Uninsured :Listwise N = 29

Table 6.154. Housing Assistance for Insured and Un-insured Hhs

	ZDS Purchase								
	Insured			Uninsured			Differences		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	Z	p
Housing assistance should be only for insured homeowners.	3.6316	114	1.38426	2.6765	34	1.36450	1219.5	-3.373	.001
housing assistance for everyone - all victims of earthquake including uninsureds	3.4957	117	1.31059	4.0286	35	1.09774	1569	-2.178	.029
less housing assistance to the uninsured	3.1481	108	1.23663	2.8824	34	1.32035	1600	-1.164	.245
housing assistance for tenants (such as rent subsidies)	3.8611	108	1.02728	3.8485	33	1.14895	1774.5	-.039	.969

Differences in the judgements of Hhs for post-disaster housing assistance reveals un-insured Hhs' expectation of State-aid. First, although insured Hhs agree with 'housing assistance should be only for insured Hhs', un-insured Hhs tend to disagree with this statement. At the same time, the difference in their judgements is at a statistically significant level. Likewise, insured Hhs disagree with 'housing assistance should be offerred for everyone, including un-insureds', while un-insured Hhs tend to agree with this statement. In addition, difference in their judgement is found again significant. On the other hand, insured Hhs tend to be uncertain about 'less housing assistance to un-insureds', whereas un-insured Hhs tend to disagree (Table 6.154).

Insured Hhs disagreed with offering housing assistance to everyone, including un-authorized houses. In contrast, un-insured Hhs seem to be uncertain and agree with offering housing assistance to everyone. Despite, insured Hhs were uncertain about offering 'less housing assistance to owners of un-authorized houses', whereas un-insured Hhs tend to disagree with less housing assistance to these houses. In addition, there is observed statistically significant difference between insured and un-insured Hhs in their agreement for housing assistance to owners of un-authorized houses. Accordingly, insured Hhs tend to disagree with offering assistance to them, in contrast to un-insured Hhs (Table 6.155).

Table 6.155. Housing Assistance for Illegal Houses

	ZDS Purchase								
	Insured			Uninsured			Differences		
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	Mann-Whitney U	Z	p
Housing assisstance for everyone - also including the owners of illegally houses	2.6429	112	1.21446	3.1471	34	1.37361	1510.5	-1.869	.062
Less housing assistance for homeowners of illegal houses	3.0833	108	1.24649	2.8286	35	1.15008	1626.5	-1.276	.202
Any housing assistance for homeowners of illegal houses	3.3077	104	1.23128	2.6000	35	1.16821	1247.5	-2.871	.004

Socio-economic Attributes of Hhs: Among both insured and un-insured Hhs, agreement with the state-aid expectation of people seems to be inversely related with the income level. Particularly, low income Hhs among insured Hhs appear to disagree with the expectation of State-aid, if the ZDS purchase is not made compulsory. In addition, low income Hhs among both insured and un-insureds seem to disagree with total refusal of State from housing assistance to the un-insureds (Table 6.156).

Table 6.156. Households' Socio-Economic Attributes and State-aid Expectation

Spearman's rho Correlation Coefficient	Being Insured	Education of Hh-Head by Years	Income Amount (Av. of Income Levels)
If the earthquake insurance is not compulsory, nobody will buy insurance and after an earthquake, everybody will expect State aid.	Insured	-.050	-.267(*)
	Uninsured	.091	-.208
People do not buy earthquake insurance, because they know the government will assist in the case of a disaster	Insured	-.008	-.042
	Uninsured	-.105	-.028
State shouldn't assist for housing to the uninsureds.	Insured	.002	-.128
	Uninsured	.137	-.324

* Correlation is significant at the 0.05 level (2-tailed). Insured :Listwise N = 90 and Uninsured :Listwise N = 26

Socio-cultural Attributes of Households: Agreement of insured Hhs with'people do not purchase ZDS, because they know the State will assist after an earthquake' is found as directly related to hierarchical, individualistic and fatalistic world-views and social influence. That is, insured Hhs seem to have this judgement not only from their own opinions but also from their social environment, where earthquakes and earthquake preparedness is spoken in their daily life. In addition, agreement of insured Hhs for 'State shouldn't offer housing assistance to un-insureds seem to be also influenced by their social environment. However, both insured and un-insured Hhs that have egalitarian world-view agreed with that 'If ZDS is not compulsory, nobody will buy ZDS, everybody will expect State-aid'. This finding can explain that Hhs among insured and un-insureds with egalitarian world-view seem to prefer that everybody should benefit from ZDS. The suitable way for this purpose, therefore, seem to be compulsory purchase of ZDS. and nobody should expect State-aid (Table 6.157).

Table 6.157. Households' World-views and State-aid Expectation

Spearman's rho Correlation Coefficient	ZDS Purchase	Hierarchical World-view	Individualistic World-view	Fatalistic World-view	Egalitarian World-view	Social Influence
People do not buy ZDS, because they know the State will assist after an earthquake	Insured	.257(*)	.232(*)	.338(**)	.029	.451(**)
	Uninsured	.225	.063	-.018	-.176	-.163
If ZDS is not compulsory, nobody will buy ZDS, everybody will expect State aid.	Insured	.408(**)	.411(**)	.161	.504(**)	.259(*)
	Uninsured	.407	.422	.370	.632(**)	.168
State shouldn't assist for housing to the uninsureds.	Insured	.280(*)	.332(**)	-.088	.181	.315(**)
	Uninsured	.188	.373	.107	.056	-.025

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 80 and Uninsured :Listwise N = 20

Perceived Attributes of ZDS System: Both insured and un-insured Hhs that perceive ZDS purchase as compulsory in the existing system seem to agree with that 'State shouldn't assist for housing to un-insured Hhs'. This finding can prove that compulsory purchase of ZDS can prevent State-aid expectation. In addition, compulsory purchase of ZDS seems to increase the solidarity attribute of ZDS system among both insured and un-insured Hhs. Indeed, being confused bout the reluctance of people to purchase ZDS is also found as related to agreement with 'State-aid expectation of un-insured Hhs' by both insured and un-insured Hhs. That is, although people explain that they are confused for reluctance of people, the main reason of declining ZDS purchase seems to be expectation of State-aid (Table 6.158).

Table 6.158. Expectation of State-aid and Perceived Attributes of Current ZDS System

Spearman's rho Correlation Coefficient	ZDS Purchase	ZDS as Compulsory	ZDS as Solidarity	Being confused	Trust on ZDS
If the earthquake insurance is not compulsory, nobody will buy insurance and after an earthquake, everybody will expect State aid.	Insured	.672(**)	.427(**)	.639(**)	-.187
	Uninsured	.368	.600(**)	.394(*)	.063
People do not buy earthquake insurance, because they know the government will assist in the case of a disaster.	Insured	.342(**)	.216(*)	.245(*)	-.018
	Uninsured	.098	.128	.281	-.133
State shouldn't assist for housing to the uninsureds.	Insured	.430(**)	.220(*)	.479(**)	-.287(**)
	Uninsured	.391(*)	.105	.255	-.502(**)

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Insured :Listwise N = 92 and Uninsured :Listwise N = 28

In the same way, the inverse relationship between agreement with ' State shouldn't assist' and 'trust on ZDS' among both insured and un-insured Hhs seem to explain that Hhs that expect State-aid trust on ZDS system. In other words, trusting on ZDS, i.e. trusting on State about using the aggregated money in ZDS only for earthquake losses, seem to result in expectation of State-aid. In contrast, people who do not trust on ZDS system appear to purchase ZDS (Table 6.158).

6.3. EVALUATION OF HOUSEHOLDS' DECISION PROCESS, BEHAVIOR AND TENDENCIES TO POLICY OPTIONS

6.3.1. Evaluation of Homeowners' Decision Process for ZDS Purchase and Risk Mitigation

This chapter attempted to find out significant predictors of purchasing ZDS contracts and taking risk mitigation measures among Hhs through employing socio-demographic, economic and cultural attributes of Hhs as well as their perception of earthquake risk and context of disaster policies, particularly implementation of ZDS system. In addition, general risk aversion behavior, realized behavior for taking RMMs and EPMS are also searched out through their relationships to purchase of ZDS contracts, and attributes and perceptions of Hhs. As a result, there are found significant differences in attributes-perceptions and behavior-intentions of insured and un-insured Hhs. First of all, as hypothesised in the study, Hhs that purchased ZDS contracts can be categorized into two groups as (1) "risk averse Hhs, i.e. 'Hhs that purchase insurance in their daily-life voluntarily'" and as (2) "Hhs that purchase ZDS contracts because of perceiving ZDS as 'compulsory".

First type of insured Hhs, purchase also several type insurance contracts in voluntary conditions, when they are more satisfied with insurance purchase in their daily life. Indeed, these Hhs have higher education level and higher income level. They also seem to have higher social position with respect to their occupations. Second type of insured Hhs, purchase ZDS contracts, because they perceive ZDS as compulsory. In other words, if ZDS is implemented as really 'compulsory', Hhs who do not purchase insurance in voluntary conditions, can purchase ZDS contracts. Although income level and education seem not to be related to perceiving ZDS as compulsory, Hhs in middle and lower income levels that perceive the regulation of the ZDS system as compulsory appear to purchase ZDS contracts. This finding could indicate that if ZDS can be implemented really 'compulsory', Hhs, who normally would not purchase insurance, would purchase ZDS contracts because of their perception of ZDS as compulsory. In addition, implementation of ZDS as compulsory seems to persuade Hhs in lower and middle income levels to purchase ZDS contracts, because these Hhs perceive ZDS also as a social 'solidarity mechanism'.

With respect to socio-cultural attributes, insured Hhs are observed as being more hierarchical, individualistic and egalitarian than un-insured Hhs, who tend to be more fatalistic. Although there is found no direct influence of hierarchical and individualistic world-views on ZDS purchase, these world-views seem to influence perceived attributes of ZDS as compulsory and perception of earthquakes as more controllable with scientific and technical measures. In addition, egalitarian world-view seems to influence ZDS purchase behavior directly in addition to its influence on perceiving the ZDS purchase

as compulsory. Likewise, sense of belonging and social influence are likely to have more influence on ZDS purchase. In other words, Hhs who speak about earthquakes and earthquake preparedness in their social environment, and Hhs who are more dealt with the problems of their neighbourhood, tend to purchase ZDS contracts. This indicates that community based participation programs that give active roles to Hhs could increase their perception of implemented disaster policies; and therefore their participation into risk mitigation programs.

In addition, although there is no significant difference in earthquake risk perception between insured and un-insured Hhs, insured Hhs perceive earthquakes more controllable than un-insured Hhs. Depite, perceived losses is found as related to perception of earthquakes as more controllable among insured Hhs. In addition, perception of earthquakes as more controllable is observed as inversely related to the education level among insureds Hhs. Moreover, there is observed no influence of income level on perceived controllability of earthquakes. Despite, individualistic, egalitarian world-views and sense of belonging influences perception of earthquakes more controllable among insured Hhs. On the other hand, perception of losses from earthquakes and perceived controllability of earthquakes are directly related to perception of ZDS as compulsory. In other words, perceiving ZDS as compulsory seems to lead insured Hhs to perceive more losses and earthquakes more controllable and therefore causes them to purchase ZDS contracts. Perceived attribute of ZDS as compulsory is also observed as related to perception of ZDS as a 'social solidarity mechanism' among insured Hhs. Among insured Hhs, these two attributes results in perception of ZDS System and the State as more responsible for post-disaster activities. Moreover, perceiving ZDS purchase as compulsory seem to result in perceiving the ZDS system as a more prior source for compensation of losses. Therefore, these Hhs search information on purchasing ZDS contracts, which is likely to indicate their intention to purchase ZDS.

However, perceiving the ZDS system as a social solidarity mechanism is also found as related to the 'fatalistic' world-view among both insured and un-insured Hhs. Despite, un-insured Hhs seem to become more fatalistic, if they think that ZDS is a social solidarity mechanism. Indeed, this thought of un-insured Hhs could arise from perceiving ZDS purchase as not compulsory and from perceiving earthquakes as un-controllable with scientific and technical measures. Hence, un-insured Hhs are likely to perceive themselves outside of the social solidarity mechanism of the ZDS system because of perceiving less losses to themselves and perceiving earthquakes as less controllable.

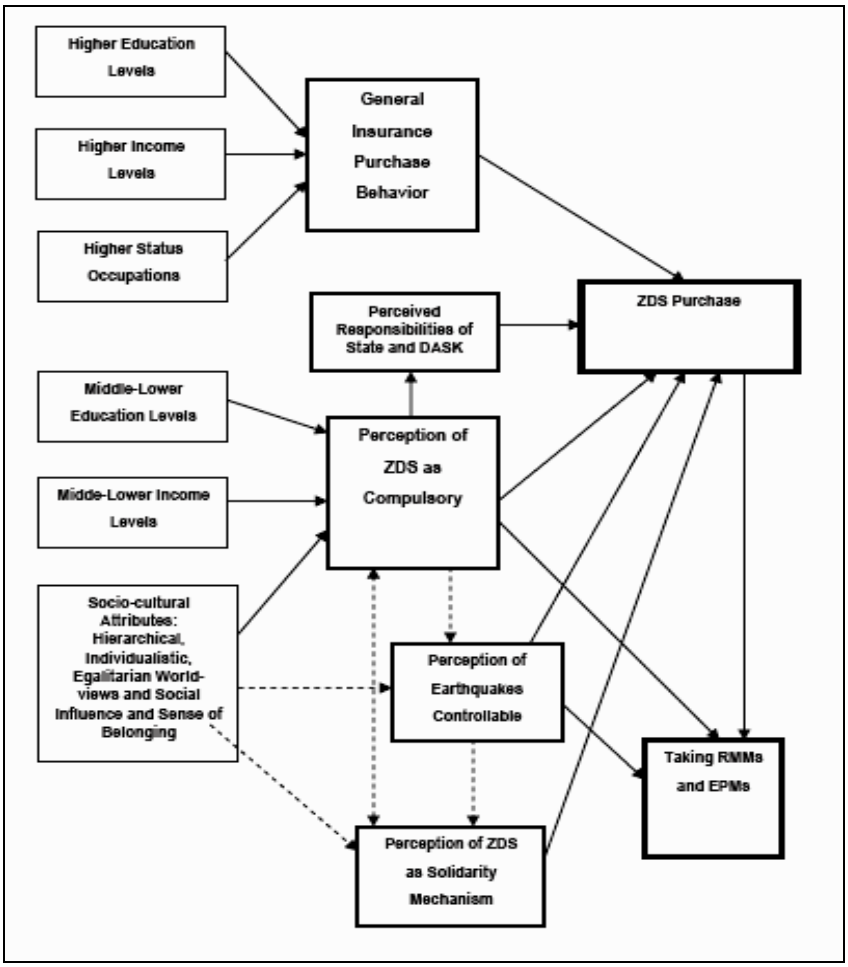


Figure 6.1. Influential Factors on ZDS Purchase Behavior and Risk Mitigation

For this reason, un-insured Hhs could tend to perceive the ZDS system and the State as irresponsible for post-disaster activities. Instead, they perceive homeowners more responsible in relation to their perception of themselves outside of the ZDS system. However, insured Hhs tend to perceive themselves in the social solidarity mechanism of the ZDS system, which seems to be related to their perception of ZDS as compulsory, perceived losses to themselves and perceived controllability of earthquakes. On the other hand, many un-insured Hhs claimed that they have inspected their buildings' vulnerability. Although their expectation of less losses could be involved with inspection of building, they are found as perceiving their building unsafer than insured Hhs. In contrast, insured Hhs

who inspected their buildings seem to perceive their building safer, when they continue to purchase ZDS contracts, which is likely to be influenced by their perception of ZDS as compulsory. In addition, insured Hhs are observed as taken more EPMS, when taking these measures is also found as related to perceiving ZDS as compulsory.

In conclusion, these findings indicate that 'perception of ZDS as compulsory' has more influence on ZDS purchase than other variables. Therefore, implementing ZDS as compulsory may be a suitable strategy to increase the penetration ratio of ZDS, because implementation of ZDS as compulsory seems to increase the 'perceived controllability' of earthquakes, which could result in taking more RMMs and EPMs. In addition, fatalistic world-view seems to be reduced in terms of increasing the perceived controllability of earthquakes, which is likely to be involved with perceiving themselves within the social solidarity mechanism of the ZDS system. However, this finding can also indicate that implementing no risk mitigation policy in terms of ZDS system could result in perceiving themselves outside the social solidarity mechanism, which seems to cause fatalism and result in less wiliingness to take mitigation measures.

6.3.2. Evaluation of Households' Tendencies to Alternative Policy Options

In general, insured Hhs agreed with the policy options related to the compulsory regulation of the ZDS system, whereas many un-insured Hhs tend to agree with the voluntary purchase of ZDS. Firstly, insured Hhs thought that legislation of the ZDS system should be approved in Turkish Parliament with effective punishments, whereas un-insured Hhs seem to be uncertain because of having no interest. Likewise, most of the insured Hhs agreed with the implementation effective penalties. Yet, both insured and un-insured Hhs disagreed the with pecuniary penalties. Despite, all Hhs agreed with the compulsory regulation of the ZDS system in the case of forcing 'all units in buildings' to purchase ZDS contracts, i.e. insurance the buildings as a whole. In addition, all Hhs have a tendency to implement ZDS system through taxations such as reflecting the ZDS premiums into property tax and/or other compulsory payments such as electricity, water and telephone. This means that these taxation policies could also convince the un-insured Hhs in the current ZDS system to purchase ZDS contracts. Hence, pecuniary penalties are also likely to be implemented, if the ZDS system could collaborate with these running costs, e.g. property tax and other compulsory payments such as electricity, water, etc., and the ZDS purchase could be made compulsory for the buildings instead of leaving individual decisions.

As expected, both insured and un-insured Hhs in the middle and lower income levels are observed as more willing to purchase ZDS contracts compulsorily and through taxations, i.e. running costs. Despite, the un-insured Hhs in lowest income level disagreed with these policy options, which seems to be involved with worrying about their unaffordability to ZDS contracts. Both the insured and un-insured Hhs in lower income levels also seem to expect State-aid, when insured Hhs seem to perceive the ZDS purchase as a pre-condition for the State-aid. In addition, tendency of insured Hhs to the 'compulsory' regulation of the ZDS purchase is found as related to hierarchical and individualistic world-views, whereas this tendency of un-insured Hhs seems to be related to their fatalistic world-view On the other hand, some un-insured Hhs with egalitarian world-view also tend to implement ZDS as compulsory, which is involved with their agreement of forcing 'all units in buildings' to purchase ZDS. In other words, reflecting the ZDS premiums into property tax and other compulsory payments seems not to cause fatalistism.

In addition, perceived controllability of earthquakes is related to tendency of Hhs toward compulsory implementation of ZDS among insured Hhs, while perceived controllability of earthquakes causes also some un-insured Hhs to agree with implementation of ZDS as compulsory for 'all housing units in buildings'. On the other hand, perception of current implementation of ZDS as compulsory is related to tendency of all Hhs for 'compulsory' implementation of ZDS. This indicates that some un-insured Hhs that perceive ZDS as compulsory do not purchase ZDS. Their tendency toward enforcemens of all units in the building is likely to indicate the possibility of their inclusion into the ZDS system, if these policy options are implemented. This finding can also be verified through the observed tendency of un-insured Hhs toward implementation of ZDS in terms of property taxes and reflection into other compulsory payments, which are inolved with their perception of current ZDS system as compulsory. That is, some un-insured Hhs seem to necessitate encouragements and more ordinary systems to purchase ZDS contracts.

Although some un-insured Hhs tend to agree with voluntary implementation of ZDS system, these Hhs seem not to purchase ZDS, if ZDS is purchased in voluntary conditions, because they disagreed with the policy options to encourage people to purchase ZDS. Particularly un-insured Hhs in lowest income level tend to agree with voluntary implementation of ZDS more than other un-insured Hhs. This finding could indicate that there is a need to implement complementary social policies or subsidies for these Hhs in lowest income level. On the other hand, insured Hhs' tendency for increasing ZDS purchase in society is found as involved with their hierarchical and egalitarian world-views as well as their feelings as sense of belonging and perceived controllability in life. Moreover,

disagreement of un-insured Hhs with 'encouragement and persuasion of people to purchase ZDS' seem to be involved with the perception of earthquakes uncontrollable.

However, there are also un-insured Hhs that prefer implementation of ZDS compulsorily, when they also would prefer the extensive purchase of ZDS in society. On the other hand, 'certification of building' for ZDS purchase each year is agreed by both insured and un-insured Hhs as one way to 'declare a national state of war for ZDS'. Moreover, these Hhs also agreed with 'reflecting ZDS premiums into property tax' and 'other compulsory payments' as well as with 'requirement of ZDS for these compulsory payments'. Indeed, implementing ZDS in these ways can provide certification of buildings easily, which can be achieved through cooperation of ZDS with local administrations.

In addition, both insured and un-insured Hhs tend to agree with other incentives such as discounted ZDS premiums and property tax. They seem to agree with the certification of buildings in the case of discounted ZDS premiums. Indeed, certification of buildings is also agreed with by all Hhs that tend to implement ZDS compulsorily. In addition, 'implementing ZDS compulsory for buildings instead of housing units' is also accepted by un-insured Hhs, when these Hhs expect discounted ZDS premiums for their regular purchase of ZDS contracts for their whole building. Moreover, both insured and un-insured Hhs seem to agree with 'reflecting ZDS into property tax' and 'other compulsory payment as a way to persuade people to purchase ZDS. Indeed, un-insured Hhs may prefer collective policies to enforce the purchase of ZDS contracts for all units in the building and then ceritification of building, because they seem to ignore purchasing ZDS contracts in voluntary conditions, although they do not intend. If ZDS is implemented in terms of reflecting into property tax, both insured and un-insured Hhs expect also premium discounts and/or discounts in property tax. As a result, 'certification of buildings' may be 'key policy' to increase penetration ratio of ZDS, which can be achieved through reflection of ZDS premiums into property tax or compulsory payments. In turn, Hhs can be rewarded by premium discounts. These policy options seem to increase perceived social solidarity attribute of ZDS in society.

On the other hand, perceiving more earthquake losses and perceiving earthquakes as more controllable seem to influence the agreement level of both insured and un-insured Hhs with these policy options that can increase the ZDS purchase extensively. Thus, implementing these incentives requires increasing perceived controllability of earthquakes. In addition, perception of ZDS as compulsory is inversely related to agreement with voluntary implementation of ZDS. That is, compulsory implementation through punishments can prevent un-insured Hhs to tend voluntary policies. Findings for other policy options are explained as:

Determination of ZDS Premiums and Fairness

Inclusion of all people, particularly people at low risk, seem to be achieved through compulsory implementation of ZDS, according to both insured and un-insured Hhs. Fairness in the society seem to be accomplished through purchase of ZDS by everybody, which could be in terms of enforcing all units in the building to purchase ZDS contracts instead of housing units. To include people at low risk to ZDS system, all Hhs agreed with the 'certification of buildings', when insured Hhs thought that discounts in ZDS premiums and property tax can be used for this purpose. According to insured Hhs, these incentives can also prevent unfairness in the society. For all Hhs, the purchase of ZDS contracts should be compulsory to all income levels. Despite, all Hhs thought that 'it is not fair if low income families at high risk pay full price of ZDS', when agreed with 'if annual ZDS premiums are determined according to risk level, it will not favour low income families'. Likewise, all Hhs thought that the State should provide 'ZDS assistance' to low income families. This findings seem to indicate that affordable and subsidized premiums could be implemented for low-income people, although they can have property at high risk. Despite, insured Hhs agreed that owners of un-authorized houses should pay expensive ZDS premiums to encourage them for risk mitigation. However, all Hhs agreed with implementing subsidized premiums to owners of un-authorized houses that have low income level.

Contribution of ZDS into Risk Mitigation

Both insured and un-insured Hhs agreed with the contribution of the ZDS system into risk reduction in terms of offering credits to municipalities. According to their judgmenets, a certain amount of aggregated ZDS premiums should be used to reduce earthquake risk in schools, hospitals and other infrastructure systems. In addition, all Hhs agreed with encouragement of people to take RMMs through giving a certicifate and technical assistance by municipality, when they also agreed with offering retrofitting priority to the regular purchases of ZDS premiums in their buildings. These Hhs seem to expect discounted ZDS premiums to the retrofitted buildings. Indeed, insured Hhs agreed with the contribution of ZDS into risk mitigation more than un-insured Hhs. Hhs' preferences also indicates that they need technical assistance for retrofitting. In addition, they also prefered the retrofitting priority to the regular purchasers of ZDS contracts. In fact, un-insured Hhs seem to need more encouragement through priority for retrofitting, technical assistance and premium discounts. All Hhs tend to agree with implementing ZDS through reflecting premiums into property tax and giving banking credits for retrofitting together, which could be another policy options.

On the other hand, although socio-demographic and economic attributes of Hhs seems not to be related with their tendency to these policy options involved with risk mitigation incentives, credits and priorities, the world-views examined here are found as related to their agreement with these policy

options except fatalsitic world-view, particularly among insured Hhs. Tendency of insured Hhs to risk mitigation policies is also observed as related to their perception of losses and risk as well perceived controllability of earthquakes. In addition, perceived probability of earthquakes is found as involved with 'having priority for banking credits' among un-insureds, when their reluctance could be explained by their perception of the current ZDS system. Finally, tendency to 'having priority for retrofitting assistances and credits' seems to increase perceived social solidarity attribute of ZDS among all Hhs. In other words, if the ZDS system could promote risk mitigation in terms of providing premium reductions and credits, the fatalistic behavior of Hhs seems to be diminished, when the social solidarity attribute of the ZDS system could be understood, which could increase the ZDS purchase and risk mitigation behavior among both insured and un-insured Hhs.

Post-disaster Policies, Expectation of State-aid and the ZDS System

Although un-insured Hhs disagreed with their State-aid expectation, they agreed with the State-aid expectation of people, if the ZDS is not implemented compulsorily. In addition, they thought that the State should assist to un-insured Hhs, when they disagreed with 'less housing assistance to un-insureds'. Moreover, the un-insured Hhs seem to agree with the compulsory regulation of the ZDS system, if the State will not compensate earthquake losses any more. both insured and un-insured Hhs thought that reflecting ZDS into property tax and other compulsory payments can prevent housing assistance fo State to un-insureds; and therefore, expectation of State-aid by un-insured Hhs. According to all Hhs, the voluntary regulation of the ZDS system cannot prevent expectation of State-aid. However, there are also people, who think that voluntary implementation of ZDS but completely independent from State, i.e. privatization, can prevent expectation of State-aid. Certification of buildings, discounted ZDS premiums and property taxes could also be used to prevent this expectation. In other words, if everyone can participate to the ZDS system, nobody can expect State-aid. On the other hand, perceptions of the current ZDS system as compulsory and as a social solidairty mechanism seem to prevent the expectation of the State-aid among both insured and un-insured Hhs.

---

[1] Mann-Whitney U=1264.5, z=-2.347, p=0.019 and Mann-Whitney U=1229, z=-2.365, p=0.018, respectively.
[2] Mann-Whitney U=28.5, z=-2.609, p=0.009 and Mann-Whitney U=72.0, z=-2.438, p=0.015, respectively.
[3] Mann-Whitney U=1356.5, z=-3.373, p=0.001 and Mann-Whitney U=1401, z=-2.564, p=0.010, respectively.

CHAPTER 7

ASSESMENT OF POLICY OPTIONS AND CONCLUSION

The survey and analyses carried out here indicate that there are possibilities to implement ZDS particularly as a policy tool for urban risk mitigation in Turkey. It is observed that urban settlements in Turkey have multiple risks and have extra reasons to comply with the new international policy that gives top priority to risk mitigation at all levels. This approach demands the action and involvement of local administrations, public participation and urban planning for effective results and social resilience. The need to share responsibilities and finances also indicates that risk mitigation has to be achieved collectively through a 'national / local mobilization'. In other words, sharing responsibilities for earthquake risk mitigation, and the establishment of a mechanism of 'social solidarity' between all stakeholders has to be a primary target for disasters policy in the country. Current approaches to risks and natural disasters in the international community support sustainable pre-disaster risk mitigation and rely largely on the urban planning discipline as a central activity. Yet the relevance of contributions local administrations and urban planning can provide, and its functions in mitigation are not totally mainstreamed into the organizational and legal system of in Turkey. This is not only apparent with insistence of settling in the hazardous areas, but also with the political reluctance for implementing urban risk mitigation, as observed still after catastrophic floods (September 2009) in Istanbul. All activism take place after the disaster.

In this context, the ZDS system could constitute a solidarity mechanism for directing investments into risk mitigation in all levels of society. Indeed, the ZDS system is not only established to share earthquake losses among households, but also to contribute safer planning and construction. In addition, the potential of the ZDS system in its contribution to risk mitigation increases not only from implementing insurance techniques, but also from its basic nature as a public-private partnership. That is, apart from commercial activities, the ZDS system can directly communicate with official bodies, the State, and particularly with the local administrations. This is what urban planners would expect from the ZDS system for a coordination of mitigation activities at a local level. However, the ZDS system prefers currently to govern risks itself, instead of some form of cooperation with other stakeholders.

Governing risks by itself causes the ZDS system renders it inefficient with low levels of penetration, as verified in this study as well, but also gives rise to social inequalities.

It is relevant therefore to review in what other modes the ZDS could be structured to increase penetration, reduce social inequalities, and function to reflectively reduce risks.

7.1. ASSESSMENT OF POLICY OPTIONS

Based on cases and discussions in the literature, a set of policy options for the implementation of a more efficient insurance system deem relevant and plausible in the Turkish context. Findings of the empirical study in Zeytinburnu suggest that the ZDS system could be implemented more effectively in urban Turkey. In assessing the suitable strategy to implement in the ZDS system, 'efficiency' and 'equity' criteria seem to be approach of the new international policy. To achieve the 'efficiency' in the ZDS system, policy options are assessed at two levels. One is the possible increase in the penetration ratio of ZDS system, and the other is the possible reductions in the physical and financial risks. In addition to policy options that can be implemented directly by the ZDS system, complementary policy options and social policies are reviewed these in the case of failures faced in the processes of 'increasing penetration ratio' and 'financial risk reduction' steps striving for efficiency.

Complementary policy options are dealt within the requirements for efficiency of the ZDS system. Social equity policy options, on the other hand, address social measures to prevent confronting possible inequalities during the efficient operation of the ZDS system. Assessment of these policy options indicates that accomplishing efficiency and equity of the ZDS system requires substantial contribution of the local administrations. Overcoming the failures at almost each step of the operations of the ZDS system, local administrations can perform various facilitating tasks. Their contribution to the ZDS system seem to differ from implementing insurance techniques to handling with deficiencies of these techniques in terms of complementary and social policies. They can facilitate both the expansion of the insurance market, and the reduction of costs of the citizens. Yet, the success of local administrations necessitates enhancing their financial and technical capacities. On the other hand, the ZDS system can expand their requirements in terms of various policy options.

A hierarchy of these policy options evaluated here to assess the 'efficiency and equity' of the ZDS system are listed a follows:

A. Increasing Penetration Ratio

A-1. Voluntary Purchase of ZDS Contracts

A-1.1. Encouraging Purchase of ZDS Contracts through Incentives

A-1.1.1. Offering Deductibles for Collective ZDS Purchase in the Building

A-1.1.2. Providing Deductibles in ZDS Premiums and Property Tax

A-1.1.3. Certification of Buildings that Purchase ZDS Contracts Regularly

A-2. Compulsory Purchase of ZDS Contracts

A-2.1. Compulsory Inclusion of Natural Hazard Peril into Home and/or Fire Insurance Coverage

A-2.2. Offering Stand-alone Natural Hazard Insurance Contracts in terms of Making These Contracts as a Pre-condition of Housing Mortgage or Loans.

A-2.3. Enforcement through Conditional Pecuniary Sanctions

A-2.4. Monitoring the Purchase of ZDS Contracts through the Transactions of Public Institutions

A-2.4.1. Requirement of the ZDS Contracts during Property Transactions

A-2.4.1.1. Using Title Deed Transactions

A-2.4.1.2. Requirement Based on Local Running Costs such as Property Tax, Electricity, Water and Natural Gas

A-2.4.2. Reflecting ZDS Premiums into Compulsory Payments

A-2.4.2.1. Incorporating Costs of ZDS into the Running Costs such as Electricity, Water and Natural Gas

A-2.4.2.2. Incorporating Costs of ZDS into the Property Tax

A-2.5. Enforcement of all Dwelling-units in the Building to Purchase ZDS Contracts

A-3. Complementary Strategies to Increase Penetration Ratio

A-3.1. Total Refusal of the State-aid for Urban Buildings

A-3.2 Increasing Awareness on Earthquake Risk and the Attributes of ZDS System

A-3.2.1. Determination of Information Type

A-3.2.1.1. General Earthquake Risk and Preparedness

A-3.2.1.2. Specific Losses from Earthquakes and Ways of Risk Mitigation

A-3.2.1.3. Giving Messages about Compulsory Implementation of the ZDS system

A-3.2.2. Determination of Communication Sources

A-3.2.2.1. Using Communication Sources at ‘National Level’

3.2.2.1.1. Using Mass-media

3.2.2.1.2. Organization of Courses in the Schools

A-3.2.2.2. Communication Sources at ‘Local Level’

3.2.2.2.1. ZDS System, Insurance Companies and Agents and ZDS Contracts

a. Visiting Cities

b. Using Insurance Agents

c. Informing the Property Owners for the Renewal of the ZDS contracts

d. Job-based Associate Organization at Production-units

e. Real Estate Firms/Agents

3.2.2.2.2. Employment of Data of Public Institutions, Local Administrations and Urban Plans by the ZDS System

a. Determination and Informing Eligible Homeowners

b. Informing Homeowners during Transactions

A-3.3. Social Policies to Increase Purchase of ZDS Contracts

A-3.3.1. Inclusion of Middle-Low Income Urban Homeowners into ZDS system

A-3.3.2. Inclusion of Lowest-Income Urban Homeowners into ZDS System

A-3.3.2.1. Implementing Affordable Premiums through Flat-Rates

A-3.3.2.2. Subsidized Premiums at Affordable Prices to Targeted Groups

A-3.3.2.3. Determination of Low-income Urban Homeowners across the Country

A-3.3.3. Preventing 'Direct' Exclusions and 'In-direct Inclusions'

A-3.3.3.1. Offering More Expensive Premiums than that of Authorized Housing Stock

A-3.3.3.2. Inclusion of un-authorized houses by Creating 'Urban Risk Mitigation' Opportunities

A-3.3.3.3. Subsidized Premiums for Low-income Urban Homeowners in Un-authorized Houses

B. Risk Reduction

B-1. Improving Earthquake Risk Information Sources

B-1.1. Using Scientific Information at the Urban Level

B-1.1.1. Using Urban Hazard and Risk Maps

B-1.1.2. Using 'Multi-Hazard' Urban Risk Maps

B-1.2. Using Contractual Methods to Obtain Information from Homeowners

B-1.3. Using 'List of Safety Variables' from Urban Risk Maps

B-1.4. Extending the Scope of ZDS into Urban Hazards and Risks

B-2. Encouraging and/or Enforcing Risk Mitigation in the Housing Stock

B-2.1. Using Contractual Methods

B-2.1.1. Deductibles in the ZDS Premiums

B-2.1.2. Co-insurance with Compensations

B-2.2. Using Property Tax for Risk Mitigation

B-3. Extending the Scope of ZDS to Urban Risks

B-4. Complementary Strategies to Encourage and/or Enforce Urban Risk Mitigation

B-4.1. Increasing Awareness on Earthquake Risk and Urban Risk Mitigation Techniques

B-4.1.1. National Level Information Sources

B-4.1.2. Local Level Information Sources

B-4.1.2.1. Using ZDS Contracts

B-4.1.2.2. Preparing Risk Mitigation Brochures/ Pamphlets

B-4.1.2.3. Participation in Urban Risk Mitigation Plans

B-4.1.3. Compulsory Purchase of the ZDS Contracts

B-4.2. Providing Access to Safer Land and Residential Areas

B-4.3. Providing Access to Risk Mitigation in the Same Building

B-4.3.1. Providing Financial Assistance for Risk Mitigation

B-4.3.1.1. Providing Risk Mitigation Credits

B-4.3.1.2. Linking Risk Mitigation Credits into ZDS Contracts

B-4.3.1.3. Determination of Credit Types

B-4.3.1.4. Informing Households about Risk Mitigation Credits

B-4.3.1.5. Providing Rent Subsidies during Risk Mitigation

B-4.3.2. Providing Technical Assistance

B-4.3.2.1. Determination of Risk Mitigation Options via 'Urban Risk Mitigation Plans'

B-4.3.2.2. Local Risk Mitigation Offices via Community-based Risk Mitigation Projects

B-4.4. Determination of Priorities and Social Policies for Risk Mitigation

B-4.4.1. Priority of High Risk Areas:

B-4.4.2. Enforcing High Risk Areas for Risk Mitigation

B-4.4.3. Providing Access to Low-Income Homeowners for Risk Mitigation Options

B-4.4.4. Priority of Buildings for Long-term Purchased ZDS Contracts

B-4.4.5. Creating 'Urban Risk Mitigation' Opportunities to Include Un-authorized Housing

B-4.4.5.1. Assessment of Earthquake Risk in Un-authorized Housing Stock in terms of Urban Risk Maps

B-4.4.5.2. Creating Urban Risk Mitigation Options for Un-authorized Housing Stock

B-4.5. Certification of Buildings According to Standards of Urban Risk Maps

B-4.6. Inspection of Risks and Monitoring of Changes in Risk Levels

B-4.6.1. Emphasizing Pre-Disaster Activities

B-4.6.2. Organizing Responsibilities

B-4.6.3. Integrating Building Inspection Mechanism into ZDS system

B-4.7. Community-based Risk Mitigation Projects

7.1.1. Policy Options to Increase Penetration Ratio (A)

To be a financially sustainable mechanism that relies on its own financial resources, the ZDS system needs to have a higher penetration ratio than the current rates. The existing regulation of the ZDS system belongs to neither to 'voluntary' nor to 'compulsory' regulation categories. In spite of having the title 'compulsory', the ZDS contracts are sold in almost totally voluntary conditions. To increase the penetration of rate of the ZDS system, the suitability of the two regulations is reviewed out in this study. Achievement of the increase in penetration ratios requires different strategies under these two regulations.

A-1. Voluntary Purchase of ZDS Contracts

A-1.1. Encouraging Purchase of ZDS Contracts through Incentives

Although voluntary purchase condition does not seem to be a suitable strategy for the implementation of the ZDS system, offering incentives could be a policy option to increase penetration ratio of ZDS system if voluntary conditions prevail.

A-1.1.1. Offering Deductibles for Collective Purchase in the Building

The existing ZDS system attempts to increase the penetration ratio by offering deductibles in the premiums (20% deductible in each ZDS contract), if the purchase of ZDS contracts in one building is more than eight units. This is a magical figure described in the 'Flat Ownership Law' above which various obligations become effective. Reduction of costs of insurance in such buildings could be interpreted as compensation. However, residential buildings with less than eight units are punished in this decision. To achieve greater penetration therefore the condition could be re-stated as a privilege provided to any group application of this size in every district. Instead of this policy option, it was

observed that households in the Zeytinburnu field study favor another policy option as 'forcing all units in the building to purchase ZDS contracts' (Table 6. 97; Policy Option A-2.5).

A-1.1.2. Providing Deductibles in ZDS Premiums and Property Tax

Both the insured and un-insured households in the Zeytinburnu field survey supported implementation of deductibles in the ZDS premiums and/ or property taxes in the case of their regular purchase of ZDS contracts. Particularly, implementing 'deductibles in ZDS premiums' is evaluated by both insured and un-insured homeowners as a way to encourage and persuade people to purchase ZDS contracts, instead of rebates in property-tax (Table 6.110). However, both insured and un-insured homeowners that prefer this policy option seem not to rely on voluntary purchase of ZDS contracts (Table 6.111). Instead, the common policy preferred by both insured and un-insured homeowners is found as 'enforcement of the ZDS purchase for all units in the buildings' (Table 6.113; Policy Option A-2.5).

A-1.1.3. Certification of Buildings that Purchase ZDS Contracts Regularly

Certification of buildings was implemented by insurers in Istanbul as a reward to encourage people to purchase fire insurance in 1800s. Most of the homeowners in the Zeytinburnu field survey thought that certification of buildings for regular purchase of the ZDS contracts can be a way to encourage such purchases (Table 6.110). Accordingly, this policy option can encourage particularly un-insured households in the existing system. However, both insured and un-insured homeowners in the survey that agreed in the implementation of this policy option thought that ZDS purchase should not be completely be voluntary (Table 6.111). Instead, they preferred compulsory purchase of the ZDS contracts with 'effective penalties' (Table 6.112; Policy Option A-2.3) and 'enforcement of ZDS purchase for all units in the buildings' (Table 6.113; Policy Option A-2.5).

A-2. Compulsory Purchase of the ZDS Contracts

To overcome market failure in the purchase of hazard insurance, countries that suffer from low penetration ratio implement various ways to enforce compulsory purchase of natural hazard insurance such as:

A-2.1. Compulsory Inclusion of Natural Hazard Peril into Home and/or Fire Insurance Coverage

This type of enforcement can be observed in countries such as France, Spain, Switzerland, Iceland and Norway (CCS 2008). In fact, the earthquake insurance in Turkey was implemented as a peril included into fire insurance before the introduction of the ZDS system. However, the penetration ratio was lower than the current ZDS system (Selçuk et al. 2001).

A-2.2. Offering Stand-alone Natural Hazard Insurance Contracts in terms of Making These Contracts as a Pre-condition of Housing Mortgage or Loans

Setting insurance purchase as a condition of federally insured mortgage increased the demand for flood insurance in the National Flood Insurance (NFIP) in USA (NFIP 2002). Although the ZDS contracts are offered as a stand-alone insurance product in Turkey, mortgage is not a common practice yet. Instead, the ZDS contracts are required as a pre-condition in Title-Deed transactions like house buying and selling process (Policy Option A-2.4.1.1). In addition, newly constructed houses are also required to purchase ZDS contracts for the entitlement of 'occupancy permission' according to the ZDS Decree.

In addition, the policy options that emanate from the process in implementing the ZDS system could differ as:

A-2.3. Enforcement through Conditional Pecuniary Sanctions

Another way to enforce compulsory purchase was considered in the ZDS Draft Law (Article 10) as implementing 'effective punishments' to un-insured homeowners. This policy option could not be implemented because the ZDS Draft Law could not be introduced in the Turkish Parliament. The Draft Law suggested implementing monetary penalties as 25% of the ZDS contracts for each past year of ZDS contracts deferred. In the Zeytinburnu field survey, however, both insured and un-insured homeowners did not support monetary penalties, a point particularly stated by the un-insured households (Table 6.101).

A-2.4. Monitoring the Purchase of ZDS Contracts' through the Transactions of Public Institutions

This policy option takes place in the ZDS Decree (Article 12 in the Appendix A) and in the ZDS Draft Law (Article 11; in 2008; Appendix A)

A-2.4.1. Requirement of ZDS Contracts during Property Transactions

A-2.4.1.1. Using Title Deed Transactions*:* In the existing ZDS system, insurance contracts are only required during the transaction process in the Title-Deeds offices. Although most of the insured Hhs in the Zeytinburnu survey explained that they purchase the ZDS contracts during their transactions in the Title-Deeds Offices, this policy option could not lead the renewal of the ZDS contracts each year (Table 6.1). Thus, this policy option seems not to increase the purchase of ZDS contracts extensively.

A-2.4.1.2. Requirement Based on Local Running Costs Such as Property Tax, Electricity, Water and Natural Gas: To increase the penetration ratio of the ZDS system, requirement of ZDS contracts in the payments of running costs is another pre-condition that take place in the agenda of the ZDS system (The ZDS Draft Law in 2008 in Appendix A). This idea requires ZDS contracts for the ordinary provision of local services like water and natural gas in the dwelling units. Findings in the Zeytinburnu study reveal, however, that homeowners do not prefer this policy option. Instead of requirement of the ZDS contracts during the payments of these services, homeowners tend to favor reflecting the costs of ZDS premiums into the payments of these services (Table 6.103; Policy Option A-2.4.2).

A-2.4.2. Reflecting the ZDS Premiums into Running Costs

Instead of requirement of the ZDS contracts during transactions, both insured and un-insured homeowners in the Zeytinburnu field survey had the tendency to pay ZDS premiums through the running costs (Table 6.99). However, reflecting the costs of ZDS premiums can increase the costs of these services. Besides, the ZDS premiums and Tariff cannot be differentiated according to risk levels, which can cause the public to forget the earthquake risk; and thereby, endanger creation of the 'resilience culture' in society. In addition to these threats, implementation of these policy options can have other difficulties:

A-2.4.2.1. Incorporating the Costs of ZDS into Running Costs Such as Electricity, Water and Natural gas: Inclusion of the ZDS premiums into the compulsory payments of running costs such as electricity, water and natural gas can be difficult because of the tendencies of privatization in these services in the country. The basic requirement to build up such a system would be the condition that the information between these companies would be shared. The cooperation with different actors in each city with different risk rates can be time wasting and expensive for the ZDS system.

A-2.4.2.2. Incorporating Costs of ZDS into the Property Tax: Linking the ZDS system with local administrations and maintaining cooperation with centrally governed units could be proposed as another method of improving the performance of such systems. Indeed, by linking insurance payments with the property taxation has been also suggested for MLICs, which can open the way for risk mitigation in the building stock, where insurance industry and 'resilience culture' is not well-developed. Property taxes are seldom subject to evasive behavior. In addition, both insured and un-insured homeowners in the Zeytinburnu empirical survey agreed with this policy option. Particularly the un-insured homeowners have greater tendencies for this policy option than other policy options that enforce purchase of ZDS contracts (Table 6.99 and Table 6.101). However, this policy option can

cause confusions in house value (Policy Option B-2.2). On the other hand, implementing the ZDS contracts separately can prevent confusions in the increase of property value because of high earthquake risk. Therefore, instead of reflecting ZDS premiums into property tax, requiring the ZDS contracts during property tax payments and other municipal services can be more appropriate (Policy Option A-2.4.1.2).

A-2.5. Enforcement of all Dwelling-units in the Building to Purchase ZDS Contracts

The ZDS Draft Law (2000) could provide conditions to insure buildings in terms of holding the 'building managers' responsible for the purchase of the ZDS contracts, even if homeowners do not purchase (Article 10). Building managers could then reclaim such costs based on powers provided by the Flat Ownership Law (FOL) However, the ZDS Decree limits the purchase of ZDS contracts with 'homeowners' in voluntary conditions. If all the homeowners in the building do not purchase ZDS, this can cause confusions during rehabilitation and construction of the buildings. On the other hand, the FOL (No. 634) gives also responsibility to the apartment managers for purchasing insurance of the main real estate and common places of the buildings (Article 20 and 35). However, this implementation is not obvious in the Law. According to the empirical findings in Zeytinburnu, on the other hand, both the insured and un-insured Households agreed with the compulsory purchase policy option of ZDS contracts in the case of forcing 'all units in the buildings' to purchase ZDS contracts' (Table 6.101). Therefore, making apartment managers responsible for the purchase of ZDS contracts can be a suitable strategy to increase the penetration ratio and prevent exclusions in voluntary conditions. On the other hand, households that agreed with this policy option in the empirical survey supported the policy options that reward the regular purchase of the ZDS contracts (Policy Options A-1.1.1).

A-3. Complementary Strategies to Increase the Penetration Ratio

According to the findings of this study, the existing ZDS system can cause indirect exclusions. Similarly, the experiences of nations indicate that various reasons can influence the insurance purchase decisions in voluntary conditions; and thereby cause social inequalities. However, these exclusions can cause inefficiency of the ZDS system because of creating low penetration ratio and information asymmetry problems. According to the findings of the Zeytinburnu field study, the factors that can create inequalities seem to be the expectation of State-aid, perception of earthquakes uncontrollable, perceiving ZDS purchase voluntary, and having low income level (Tables 6.2; 6.38, 6. 42; 6.9 and 6.10, respectively). On the other hand, these factors can also cause inequalities even if homeowners are forced to purchase ZDS compulsorily. Therefore, complementary policies can be

developed to overcome each of these factors, based on the new international policy and the studies in the hazard literature.

A-3.1. Total Refusal of the State-aid for Urban Buildings

According to experiences of nations, continued practice of State-aid after disasters causes expectations of State-assistance in the public, which curbs the penetration ratio of natural hazard insurance in voluntary conditions of insurance purchase. Likewise, the low penetration ratio of the ZDS system in Turkey could largely be attributes to the continuing State-aid, in spite of the fact that responsibilities of the State have been abolished with the ZDS system. Very much in line with this, most of the un-insured homeowners in the Zeytinburnu field survey were observed in the expectation of State-aid (Table 6.151). These homeowners also believe that people will not purchase ZDS contracts and expect State-aid, if the purchase of ZDS contracts is not made compulsory (Table 6.148). Thus, to prevent the expectation of State-aid, the appropriate approach to the ZDS system could be its compulsory implementation with effective penalties (Policy Option A-2).

A-3.2 Increasing Awareness on Risk Mitigation and the Attributes of the ZDS System

According to empirical studies in different countries, high 'risk perception level' could be directly related to insurance purchase and risk mitigation (Palm and Hodgson 1992a,b; Lindell and Perry 2000). In addition, the new international policy also supports increasing public awareness as a way to motivate people to prepare against natural disasters and to draw attention to different forms of risks. This is believed to increase hazard awareness and risk perception level. Specific messages can be delivered to the targeted population in terms of public campaigns at the community level (UN/ISDR 2004; O'neil 2004). Therefore, information type and information sources can be determined in various ways:

A-3.2.1. Determination of Information Type

A-3.2.1.1. General Earthquake Risk and Preparedness: Information that took place on the introduction of the ZDS system on TV channels usually include usually information about the earthquake risk in the country and possible losses caused by earthquakes and emergency preparedness measures, in general. However, the findings of the Zeytinburnu study indicate that increasing the general earthquake risk perception does not result in increased ZDS purchase, and risk mitigation and preparedness (Table 6.32). Instead, the information should specify types of losses and ways of risk mitigation (Table 6.35).

A-3.2.1.2. Specific Losses from Earthquakes and Ways of Risk Mitigation: In the Zeytinburnu field survey, insured households are observed to perceive greater losses to occur them. However, perceiving greater losses does not necessarily increase the purchase of ZDS contracts. If homeowners are not offered the technical measures that can reduce their vulnerability, they can feel themselves outside of the solidarity mechanism of the ZDS system with a fatalistic attitude (Tables 6.38; 6.40; 6.47 and 6.48). For this reason, homeowners could be informed about their losses and risk mitigation measures specifically (Policy Option B-4.1), which requires local assessments of risks and risk mitigation options (Policy Option B-1) and their local dissemination.

A-3.2.1.3. Giving Messages about Compulsory Implementation of the ZDS System: Being aware on the risk mitigation techniques were found in the Zeytinburnu field survey as influenced by the 'perceived compulsory purchase' attribute of the ZDS system (Table 6.42). This finding could indicate that increasing awareness on earthquake risk and ZDS purchase in voluntary conditions does not seem to be an appropriate solution to create resilience in the society. In other words, homeowners' perception of losses and their perceived controllability of earthquake risk were found to be dependent on their perception of ZDS system as a 'compulsory' implementation (Table 6.48; Policy Option A-2).

A-3.2.2. Determination of Communication Sources

A-3.2.2.1. Using Communication Sources at 'National Level'

3.2.2.1.1. Using Mass-media: The mass-media can increase awareness with the daily newspapers and TVs. According to the findings in the Zeytinburnu field survey, insured households read more news-paper than un-insured households. It seems that the habits of reading daily news-paper are correlated with ZDS purchase significantly. That is, using daily newspapers can remind the insured households that they should renew their ZDS contracts. On the other hand, at the initiation of the ZDS system, DASK employed media advertisements on TVs to increase the penetration ratio. According to findings in the Zeytinburnu field survey, TV programs that explain earthquakes and the ZDS system can be more effective than advertisements on TVs. However, only the old-aged homeowners' purchase of ZDS contracts seemed to be related with the advertisements on TV's (Table 6.70). That is, this policy seems to influence only a subset of the population in spite of using national scale communication channels. Despite, most of the insured and un-insured Hhs supported this policy option (Table 6.109).

3.2.2.1.2. Organization of Courses in the Schools: The courses in the schools can encompass more comprehensive information on the earthquake risk and ZDS purchase, as observed in the Zeytinburnu field survey. In fact, more children and students among insured homeowners can

indicate that courses in the schools can influence their families in the purchase of ZDS contracts (Table 6.7). These policy options seem likely to convince the un-insured homeowners in the existing ZDS system to purchase ZDS contacts under voluntary circumstances. Despite, insured Hhs seem to support this policy option more than un-insured Hhs (Table 6.109).

A-3.2.2.2. Communication Sources at 'Local Level'

The new international policy also requires increasing public awareness in terms of public participation. Likewise, insured households are observed in the Zeytinburnu field survey as more involved with the problems of their neighborhood, when they are also influenced by their social environment to purchase ZDS contracts (Table 6.22). Thus, informing people at local scales can be more influential than using national scale communication channels.

3.2.2.2.1. ZDS System, Insurance Companies and Agents and ZDS Contracts

a. Visiting Cities: Since the beginning of the ZDS system, DASK organized travels into different cities to introduce the ZDS system and to give information about earthquake risk and preparedness. Although this policy option is not asked in the field survey of this study, the low penetration ratio of DASK can prove that this policy option does not necessarily increase the penetration ratio of the ZDS system.

b. Using Insurance Agents: Giving information at local scale could be achieved through insurance agents. However, implementing this policy option could require paying greater commissions to insurance companies and agents; which will increase the costs of ZDS contracts leading to un-affordable premiums and lower penetration ratio in turn. At present, the ZDS system pays nearly 40% of its annual revenue to the insurance agents for their commission services (DASK 2008). As observed in the Zeytinburnu field study, the people who receive information from insurance agents could be distinguished from other households with their 'general insurance purchase behavior' (Table 6.70). Thus, the ZDS system did not prefer this policy option either.

c. Informing the Property Owners for the Renewal of ZDS Contracts: Although DASK is responsible to inform insured homeowners for renewal of their contracts, this policy option does not target the un-insured homeowners.

d. Job-based Associate Organization at Production-units: People could also be informed in terms of job-based associates at production units.

e. Real Estate Firms/ Agents: Real Estate Agencies could inform homeowners about the earthquake risk of properties and the obligation for purchasing ZDS contracts during transactions.

3.2.2.2.2. Employment of Data of Public Institutions, Local Administrations and Urban Plans by the ZDS System

a. Determination and Informing Eligible Homeowners by the ZDS System: After the determination of eligible homeowners to purchase ZDS contracts through using the records of provinces, municipalities and registry of Title Deeds Offices, these homeowners could be informed about the ZDS system at least by sending brochures. However, this option could be expensive for the ZDS system. Instead, the transactions could be used:

b. Informing Homeowners during Transactions: Using running costs was in the agenda of the ZDS system as requiring the ZDS contracts during these payments (Policy Option A-2.4.1). Although this policy option could not be achieved up to now, the recent Draft Law (2008) also includes this policy option (Article 11 in Appendix A). At least, homeowners could be reminded to purchase ZDS contracts during their payments for running costs. Thus, brochures about earthquake risk and ZDS system could be distributed. In this way, ZDS on insurance companies could reach more candidates.

A-3.3. Social Policies to Increase Purchase of ZDS Contracts

A-3.3.1. Inclusion of Middle-Low Income Homeowners into ZDS system

According to country experiences, the voluntary purchase of ZDS contracts creates social inequalities because of leaving the decisions into individualized decisions. In the Zeytinburnu field survey of this study, exclusion of middle and low income households from ZDS system can be prevented in terms of implementing ZDS purchase as compulsory (Tables 6.10; 6.42 and 6.46 and Figure 6.1; Policy Option A-2). In addition, the insurance techniques and country experiences also indicates that houses at 'low risk' do not purchase insurance, when compulsory purchase conditions can prevent their exclusions from financial protection.

A-3.3.2. Inclusion of Lowest-Income Homeowners into ZDS system

According to the new international policy perspective, social equity problems should be reduced in terms of alienation of social vulnerability. In other words, the socio-economic capacity of low-income people should be enhanced in accessing insurance purchase. The findings of this study reveal that the insurance purchase across the country is influenced by the GDP per capita in cities (Table 4.1). In addition, the lowest income households in the Zeytinburnu field survey are observed as supporting the voluntary purchase of the ZDS contracts, although they seem to not purchase in voluntary conditions (Tables 6.115). Moreover, these households seem to expect State-aid (Table 6.156). However, implementing compulsory purchase conditions and abolishing State-aid can make their situation

worse. For this reason, there can be developed further social strategies to include these homeowners into the financial protection of the ZDS system.

A-3.3.2.1. Implementing Affordable Premiums through Flat-Rates: According to the new international policy, low-income people can be offered additional social policies such as affordable insurance premiums. Indeed, offering affordable premiums is also one of the objectives of the ZDS system. Despite, the lowest income people seem to not afford the existing premiums of the ZDS system. In the case of determination of risk-rated premiums, these homeowners can suffer from expensive premiums, because these homeowners can have properties at high risk because of not affording high-quality houses in safer areas. For this reason, the homeowners in the Zeytinburnu empirical study are asked for the fairness of implementing risk-rated premiums to low-income homeowners. Both the insured and un-insured homeowners in the empirical study thought that 'it is not fair if low income families at high risk pay full price of ZDS' (Table 6.128). However, offering affordable premiums to everyone, i.e. flat rated premiums as a ratio of property value, can prevent the differentiation of ZDS premiums according to risk level; and therefore, can cause increase of financial risk reduction in the ZDS system as well as prevents the encouragement of risk mitigation. For this reason, if 'subsidized premiums' could be offered to targeted population, this problem can be solved (Policy Option A-3.3.2.2).

A-3.3.2.2. Subsidized Premiums at Affordable Prices to Targeted Groups: Implementation of affordable premiums to the targeted population can be another policy option according to new international policy. Likewise, implementing subsidized insurance premiums is observed as a policy option, which is used by the NFIP to avoid the unaffordable insurance prices in the old housing stock. In this way, the people in this housing stock pay lower premiums than the actuarial rates. In addition, both insured and un-insured homeowners in the Zeytinburnu field survey thought that the State should provide 'assistance to low income families in paying the ZDS premiums' (Table 6.132). Therefore, the low-income homeowners can be offered subsidized premiums. The amount of the subsidy and the number of the subsidized homeowners can be determined by the ZDS system. However, in the case of having high earthquake risk in their houses, these homeowners should have priorities in accessing risk mitigation opportunities (Policy Option B-4.4.3).

A-3.3.2.3. Determination of Low-income Urban Homeowners across the Country: Implementing subsidized premiums requires the determination of the low-income homeowners across the country and at urban scale. With respect to the bottom-up approach of the new international policy, local administration can play a significant role in determining these households. In addition, the property tax

system in Turkey has also a mechanism that provides exemptions according to socio-economic levels of households. Incorporating the information system of property tax into ZDS system can be a way to determine low-income households across the country.

A-3.3.3. Preventing 'Direct' Exclusions and 'In-direct Inclusions'

The existing ZDS system directly excludes the 'un-authorized' housing stock from the financial protection of earthquake insurance. Although the State-aid is also abolished for this housing stock, the social responsibilities in the society can prevent to offer assistance. However, un-authorized houses that have construction license but no occupancy permission are eligible to purchase ZDS contracts under same conditions with the authorized houses. That is, un-authorized houses are also included into the ZDS system indirectly, which is unfair for the authorized houses. On the other hand, the un-authorized housing stock constitutes a substantial amount of the housing stock. To provide social welfare and lessen the financial burden of the State, the fair inclusion of un-authorized housing stock into the ZDS system is essential. However, their exclusion from the ZDS system directly creates social inequalities, because they are not offered any other option. On the other hand, both insured and un-insured homeowners in the Zeytinburnu field survey of this study thought that everybody in the society should be included into the financial protection of the ZDS system, to prevent social exclusions and to provide fairness (Table 6.122). They also think that un-authorized houses should also be included into the ZDS system (Table 6.133). Despite, to offer financial protection of this housing stock, certain condition can be created:

A-3.3.3.1. More Expensive Premiums than Authorized Housing Stock: Inclusion of un-authorized housing stock in the same conditions with authorized houses can create information asymmetry problems for the ZDS system. In addition, such an inclusion can also create another injustice in the society. For this reason, households are also asked for this policy option in the Zeytinburnu empirical survey. Accordingly, most of the households thought that owners of un-authorized houses should be included in the case of paying more expensive ZDS premiums (Table 6.133). However, offering more expensive premiums and risk mitigation options require additional policies.

A-3.3.3.2. Inclusion of Un-authorized Houses by Creating 'Urban Risk Mitigation Opportunities': The fair inclusion of this stock into the ZDS system requires assessment and mitigation of their risks. Indeed, homeowners in the Zeytinburnu field survey thought that owners of un-authorized houses could be encouraged to mitigate their risks, if they are offered more expensive ZDS premiums (Table 6.133; Policy Option B-4.4.5).

A-3.3.3.3. Subsidized Premiums for Low-income Urban Homeowners in Un-authorized Houses: In the case of the owners of un-authorized houses have lower income level; however, they cannot pay expensive premiums of ZDS system. To prevent such exclusion, the low-income homeowners in this housing stock can also be offered subsidized premiums. When this policy option is asked to homeowners in the Zeytinburnu field survey, all households thought that people with low-income in the un-authorized housing stock should also be offered subsidized premiums, because they think that all members of the society should be protected by the ZDS system (Tables 6.134 and 6.135). Therefore, local administrations can also be made responsible to determine the low – income homeowners in this stock, in addition to their similar responsibility in authorized housing stock (Policy Option A-3.3.2.2).

7.1.2. Evaluation of Policy Options to Increase the Penetration Ratio

According to national experiences in the world, voluntary purchase environment of natural hazard insurance does not necessarily increase the penetration ratio (Mileti 1999). In the same way, the findings of the Zeytinburnu field survey indicate that the existing ZDS system, which opts for the voluntary purchase of ZDS contracts lead to low penetration ratios, and significant differences across the urban areas and the country level distributions. As observed in the Zeytinburnu field survey, if the ZDS contracts are sold voluntarily, only the homeowners with higher education and income levels could purchase ZDS contracts, which can result in social inequalities in the society. Accordingly, both the insured and un-insured homeowners in the Zeytinburnu field survey tend to be uncertain about implementing the purchase of ZDS contracts completely voluntary. In addition, voluntary purchase of the ZDS contracts seem not to convince homeowners even if they are offered incentives such as deductibles for collective purchase, deductibles in ZDS premiums and property tax, and certification of buildings in the case of regular purchase of ZDS contracts. Instead, homeowners that prefer these incentives tend to support compulsory purchase of ZDS contracts. In addition, un-insured homeowners that perceive the existing ZDS system as voluntary tend to expect State-aid as long as ZDS contracts are not sold compulsorily.

Likewise, increasing awareness on earthquake risk and the ZDS system seem not to increase penetration ratio in voluntary conditions and necessitates the giving messages on ‘compulsory implementation’ of the ZDS system. On the other hand, the Zeytinburnu empirical survey indicates that ‘perceiving the purchase of ZDS contracts as compulsory’ can be the main difference between insured and un-insured homeowners. Accordingly, implementing the ZDS system through compulsory purchase regulation can dominantly lead the middle and lower income level homeowners to purchase ZDS contracts. These in fact are the most risky factions of the society, which are in greater risk and in greater need of support. Moreover, compulsory implementation can increase the perception of

earthquakes as controllable and can lead the homeowners to take structural risk mitigation measures by themselves. Thus, to increase the penetration ratio and risk mitigation, the ZDS system has to find out ways to implement effective means to increase perception of ZDS purchase as 'compulsory', and provide sufficient deterrents and penalties for aversive behavior (Policy Option A-2).

Among the various ways to implement purchase of ZDS contracts compulsorily, homeowners in the Zeytinburnu survey tend to support 'reflecting the ZDS premiums into running costs such as property tax, and payments of electricity, water and natural gas' and 'forcing all units in a building to purchase ZDS contracts'. Incorporating ZDS premiums into running costs of electricity, water and natural gas seem to be time wasting and expensive for the ZDS system because of necessity to cooperate different actors in each city due to privatization of these services. Instead, incorporating ZDS premiums into property tax could be easier due to cooperation with local administrations. On the other hand, implementing ZDS premiums with earthquake risk-rates is observed as essential to reduce financial risks of the ZDS system. However, reflecting risk-rated ZDS premiums into property tax could cause confusions in the property values. Preventing this confusion seems to be possible by enforcing homeowners to purchase ZDS contracts during their property tax payments. Being a separate document, homeowners can be offered the ZDS contracts together with the property tax payments, as another compulsory payment in addition to requiring ZDS contracts during other municipal services (Policy Option A-2.4.1.2).

On the other hand, implementing monetary sanctions in terms of incorporating ZDS contracts into property tax payments was found as a way to convince both insured and un-insured homeowners in the survey. Compulsory purchase of ZDS contracts can include both monetary sanctions and deductibles in ZDS premiums as additional rewards. On the other hand, another policy option that agreed by homeowners was found as 'forcing all units in the buildings to purchase ZDS contracts' (Policy Option A-2.5). Making the building managers responsible to purchase ZDS contracts for the un-insured homeowners can complete this policy concerning the other task of building managers as described in the Flat Ownership Law, i.e. insuring the shared places of the buildings. Therefore, monetary sanctions and/or incentives can be implemented to whole buildings, instead of individual homeowners (Policy Option A-2.3). Indeed, social influence and participation of homeowners was also found as one of the significant predictors of the ZDS purchase behavior of homeowners. Therefore, not only the apartment manager but also all homeowners in a building can audit and enforce each other in purchasing ZDS contracts, when each homeowner can be made pro-active in terms of organized responsibilities in the building scale.

Purchase of ZDS contracts compulsorily can also eliminate social inequalities that arise from voluntary purchase conditions. Leading the middle and lower income level homeowners to purchase ZDS contracts in terms of compulsory implementation, the ZDS system can create a social solidarity mechanism for more vulnerable homeowners in the society. Compulsory purchase of ZDS contracts for the buildings can promote implementing social policies to lowest-income homeowners. Providing affordable premiums to everyone can prevent financial risk reduction of ZDS system, particularly enforcing and/or encouraging risk mitigation. On behalf of fairness principle, as agreed with homeowners in the field survey, the lowest-income homeowners in both authorized and un-authorized houses can be offered lower compensations (Policy Options A-3.3.2.2. and A-3.3.3.3).

7.1.3. Policy Options for Risk Reduction (B)

Voluntarily or compulsorily subscribing to a system that only operates as a compensation mechanism for post-disaster losses is largely considered by all individuals as a useless cost for a remote probability. Individuals with high awareness or total ignorance tend to avoid involvement with the ZDS system as it implies and propagates a passive and fatalistic attitude. From a game-theoretic point of view, the ZDS system with its current nature provides a 'game' in which individuals are likely to 'win' if their risks are relatively higher than the other insured. Thus, it is far from generating a risk mitigation and resilience culture. It should be considered futile and unwise therefore to devise methods for its more extensive practice and greater penetration. Most of the above going alternative policy approaches and tools in the market environment are palliative. If the task of a deliberate 'risk reduction' is considered as a desirable attribute of the ZDS system, then a different set of policy tools will be necessary under a totally different horizon. The main tenets and references of this approach are then:

(a) Regulation for risk reduction is a public responsibility of the central and local governments rather than a preference of an individual freely operating in the market. Public involvement and monitoring of risk reduction is a constitutional obligation. Therefore, public authorities have to interfere and acquire numerous roles in every aspect of risk mitigation, and use their discretion in the implementation and penetration of insurance as well.

(b) Efforts of risk reduction must find its rewards not after but prior to the disaster event. Better the measures of risk reduction, higher should be the reward, which might mean lower the costs of insurance policies. This is in full harmony with the logic of the ZDS and any insurance system. Another rewarding mechanism could be the partial funding of the costs of risk reduction measures in terms of credits distributed of donations made.

(c) Encouragement and financial support of individuals for taking risk reduction measures could activate them and cause them to contemplate about their risks and methods of reducing such risks. This approach could therefore imply a best policy for awareness rising. If especially a competitive program of financial support for most efficient risk reduction is monitored, a culture of risk reduction and resilience is likely to develop. This may give rise to the discovering of new forms of risks and creative methods of mitigation.

It is worthwhile therefore to review implications of a set of policy approaches in insurance with the deliberate aim of risk reduction, while maintaining the overall conditions of collective funding and selective rewarding by means of the insurance system.

From the ZDS system perspective, implementing natural hazard insurance either in voluntary or compulsory conditions necessitates also 'reducing the financial risk' in terms of selection of risks and estimation of potential losses through 'accurate' information about insured risks. However, natural disasters are incalculable and un-insurable, since there is seldom accurate and scientific information available. Yet, estimation of potential losses can be insufficient for the efficiency of the ZDS system. High penetration ratio can cause accumulation of high risk properties in the TCIP because of the high earthquake risk in the country. For this reason, the ZDS system needs also extensive 'risk mitigation' in the housing stock. Therefore, reducing the risk of the ZDS system requires mainly:

1. Improving Information Sources
2. Mitigation of Risks in the Housing Stock
3. Extending the Scope of ZDS to Urban Hazards and Risks

B-1. Improving Information Sources

Although insurers suffer from incalculability of natural disaster risks, scientific studies can be used by natural hazard insurance pools (Kunreuther 1998; 2001). Indeed, insurers use certain insurance techniques, i.e. contractual methods, to improve their information on risks. However, the incalculable attribute of natural disasters can prevent the use of these methods, because the insureds can also lack information. These techniques can be used with the support of scientific information (Kunreuther 1998). The ZDS system can also estimate the financial risk and loss potentials according to different scenarios and with scientific information on the insured property.

B-1.1. Using Scientific Information at the Urban Level

To estimate risks through scientific models, the insurers attempt to apply these models as observed for instance in the California Earthquake Authority (CEA) in USA (CEA 2008) and National Flood Insurance Program (NFIP) in USA (NFIP 2002). To determine the risks and risk-rated premiums, the ZDS system also intended to use detailed earthquake models at the beginning (Decree No. 587). The Tariff of the existing ZDS system, however, uses insufficient information about the risks.

B-1.1.1. Using Urban Hazard and Risk Maps: Estimation of earthquake risk is related with the probability of events and necessitates assessing the vulnerability of buildings, the attributes of building ground in urban scale, correlation between the buildings and other usages (i.e. urban risks and risk sectors like infrastructure risks) in an urban area. All these dimensions of earthquake risk estimation can be assessed in terms of 'urban risk maps' (Balamir 2005). Accordingly, availability of urban hazard maps its transparency for public information could lead to the reorganization of land and property use in the free-market environment. In fact, estimation of correlated risks, i.e. urban risks, is particularly essential for the ZDS system, because the ZDS contracts also cover secondary perils such as fire and explosion. Therefore, using urban risk maps can provide the ZDS system to implement insurance techniques and estimate its potential losses accurately. In this way, the ZDS system can also decide whether to invest in risk mitigation or reinsurance. Similarly, National Flood Insurance Program (NFIP) also uses urban scale maps to assess the flood risk at local scale (NFIP 2002).

B-1.1.2. Using 'Multi-Hazard' Urban Risk Maps: Diversification of the risks in the insurance pool provides to reduce the financial risk of insurers. This technique requires covering other risks into insurance contracts (Athearn 1969). The ZDS system attempts also to cover other natural hazards into the ZDS contracts, as observed in the recent ZDS Draft Law (in 2008; Appendix A). In fact, catastrophic destruction of flood losses in Istanbul (September 2009) also support the inclusion of flood risk in the coverage of the ZDS system to lessen the financial burden of the State and homeowners in floods. Such an inclusion however, necessitates the estimation of influences of earthquakes and floods in combination. 'Multi-hazard urban risk maps' could provide the means to assess the influence of several natural disasters on properties and population, in addition to earthquake risks (Balamir 2005). Therefore, the ZDS system could provide the necessary scientific information for the classification of risks and the determination of premiums in detail from 'multi-hazard urban risk maps'.

B-1.1.2. Using Contractual Methods to Obtain Information from Homeowners

Insurers use 'contractual methods', such as 'co-insurance' and 'deductible' programs to improve their information on risk. Therefore, low risk people are encouraged to inform their risks through incentives (Li 1998; Kohler 1982). These contractual methods can be used to improve the information of the ZDS system in urban areas, where urban risk maps could not be prepared. However, homeowners could still inform their risks on a 'list of safety variables', which can be prepared through scientific information of urban risk maps, i.e. some variables used in risk classifications. Therefore, the ZDS system should design deductibles and co-insurance mechanisms according to this list of safety variables. In addition, 'approval of this information' will be necessary by authorized agents. This method can also encourage risk mitigation (Policy Option B-2.1).

B-1.1.3. Using 'List of Safety Variables' from Urban Hazard and Risk Maps

Reflecting safety variables into contractual methods is usually observed for the retrofitting activities of homeowners. For example, California Earthquake Insurance Authority (CEA) offers deductibles to buildings that meet certain safety standards including measures of a) anchoring of foundations; b) bracing requirement for cripple walls; and c) anchoring requirements for hot water heaters (CEA 2008). An insurer in California must reduce its premium amounts if these safety standards are brought up to acceptable levels. Likewise, the ZDS contracts can reflect safety variables according to factors used in 'urban risk maps'. These variables can be related to the nature of ground of the building, the building properties (whether it complies with the building code or whether it is retrofitted), usage risks, urban tissue risks, hazardous unit's risks, etc. These variables should give the necessary information to classify risks accurately. Based on the list of safety variables, low-risk homeowners can be encouraged to give information on their risks through 'deductibles in the ZDS contracts' and/or 'coinsurance mechanisms'. In addition, contractual methods can encourage risk mitigation activities of homeowners (explained in Policy Option B-2.1).

B-2. Encouraging and/or Enforcing Risk Mitigation in the Housing Stock

The world experiences in various countries indicate that people do not take necessary measures under voluntary conditions (Lindell and Whitney 2000). However, according to the new international disaster policy, people should be motivated to reduce their risks in terms of creating bottom-up participation at the community level (UN/ISDR 2004). On the other hand, using contractual methods, i.e. deductibles and coinsurance mechanisms, insurers can encourage homeowners in risk mitigation activities (Kohler 1982). Therefore, the ZDS system can use these insurance techniques to encourage homeowners for taking risk mitigation measures, which was also the initial aim of the ZDS System as described in the ZDS Decree (N0. 587; Appendix A). However, national experiences in the world

indicate that the contractual methods of insurance mechanisms can be inadequate to mitigate the risks in the society, when the discussion in the Chapter 3 indicates that risk mitigation in the society can be achieved in terms of many different ways. According to the discussions in Turkey, the ZDS system can also contribute to risk mitigation activities in various ways (Chapter 2). In general, both insured and un-insured homeowners in the Zeytinburnu empirical survey thought that the support of the ZDS system for different risk mitigation activities can also lead to increase the purchase of ZDS contracts (Tables 6.137 and 6.140).

B-2.1. Using Contractual Methods of the ZDS System

Assessing earthquake risks in the housing stock by means of urban risk maps can provide accurate information for the ZDS system to offer risk-rated premiums. Therefore, homeowners can be offered contractual methods, which can encourage their risk mitigation activities according to insurance techniques. These methods can vary as deductibles in premiums and co-insurance in compensation amounts (Kohler 1982).

B-2.1.1. Deductibles in ZDS premiums: Using risk-rated premiums to encourage risk mitigation and to promote better construction practices were also among the initial objectives of the ZDS system as described in the ZDS Decree. Risk-rated premiums can provide reductions in ZDS premiums for low risk properties, which can encourage owners of high risk properties to mitigate their risks. Particularly, high risk properties can be forced to mitigate their risks, if the insurance premiums are determined as very expensive. Therefore, instead of paying these expensive premiums, homeowners can prefer to reduce their risks. According to the findings of the Zeytinburnu field survey, homeowners were willing to take risk mitigation measures, if the ZDS system offers premiums deductibles (Tables 6.136 and 6.137).

B-2.1.2. Coinsurance with Compensations: According to insurance techniques, insurers can encourage risk mitigation, if they do not pay the full amount of compensation. In this way, owners of low-risk houses can share lower amount of compensations, whereas owners of high risk houses can pay higher amount of compensations (Kohler 1982). In fact, the ZDS Decree organizes a coinsurance mechanism in terms of Article 14, which emphasizes the post-disaster losses. Accordingly, homeowners are responsible for the changes in the buildings that caused (the increase) in the destruction of the building. They loose their right to get a certain amount in compensation in proportion of their share of responsibility. However, no implementation of this article is observed. On the other hand, using a coinsurance mechanism to encourage risk mitigation, this mechanism could consider

pre-disaster process in terms of offering homeowners risk mitigation incentives as linked to the ZDS Tariff.

B-2.2. Using Property Tax for Risk Mitigation

As suggested to MLICs like Turkey, linking risk mitigation into property tax can be used to encourage risk mitigation. Therefore, buildings with high earthquake risk can be forced to pay expensive property taxes (Kunreuther 1998). There are also discussions to make involved the property management and local administration in Turkey to risk mitigation (Balamir 2005). Although this policy option is not asked directly in the Zeytinburnu empirical survey, this policy option seems to convince both insured and un-insured households to take risk mitigation measures. In other words, offering discounted ZDS premiums to retrofitted houses seems to encourage all households for risk mitigation, if these discounts are reflected into property tax (Tables 6.136 and 6.140). Yet, the un-insured households can also be convinced for risk mitigation in the case of discounted property taxes for 5 years, in contrast to un-insured households (Table 6.142).

Mitigation of risks can increase the value of the property and therefore the amount of property tax. For this reason, the real estate tax can be reduced according to the ratio of the property risk level (Kunreuther 1998). The property tax amounts are changing in Turkey according the legal status of buildings as described in the Flat Ownership Law, when these legal status do not reflect the risk level of the buildings. People in authorized buildings, i.e. buildings with occupancy permission, pay more expensive property taxes because of Flat Ownership Law. However, the authorized buildings can also have high earthquake risk because of the nature of the urbanization process in Turkey such as legitimization through amnesties and lack of inspections during construction.

Linking property tax into urban risk maps and building certifications by local administrations through urban risk maps and building certificates: Urban risk maps can be used for estimation of risks in housing stock (Policy Option B-1), in addition, the certification of buildings (Policy Option B-4.5). After the estimation of risks, the authorized buildings with lower earthquake risk can pay lower property tax. In contrast, the buildings with high earthquake risk can be offered expensive property taxes. In the case of having earthquake risk above the minimum standards, these houses can be forced for risk mitigation in terms of different ways. For example, 'loosing the legal statuses' of the buildings and therefore paying more expensive property tax can be one way to enforce these buildings for risk mitigation.

Confusions in Property Value: However, adding earthquake risk level into property tax can confuse the buyers of houses, because although the house has lower property value, high risk level can increase its property tax. In the case of implementing this policy option, these two different

components, i.e. the property value and risk level, should be differentiated and indicated in the Title Deed.

B.3. Extending the Scope of ZDS to Urban Risks

Extending the scope of the ZDS system could provide the diversification of risks in the insurance pool. According to the findings of the Zeytinburnu survey, most of the Hhs perceive low risks from other natural hazards such as floods (Table 6.32), when most of the Hhs seem to be less satisfied with insurance purchase except the high income level Hhs (Tables 6.15 and 6.16). In addition to offering insurance to homeowners for urban hazard and risks, the scope of the ZDS system could be extended to other urban hazard and risks, when the resilience of the society depends on the reduction of urban risks. Indeed, offering insurance according to 'urban risk sectors' could be in terms of urban hazard and risk maps and urban risk mitigation plans, because the earthquake risk in urban areas cannot be limited with the building risks, but involved with 'urban risk sectors'. According to the studies of Earthquake Master Plan of Istanbul (EMPI 2003), the reduction of urban risks necessitates implementation of various risk mitigation strategies according to these urban risk sectors. Indeed, reduction of the risks in the housing stock depends on the reduction of risks in these urban sectors, which necessitate the determination of 'macro-form risks' at the first stage to evaluate urban risk sectors at the urban level. If the information on the urban risk sectors could be considered by the ZDS system, the influence of different risk sectors on the housing stock could be estimated (Policy Option B-1).

Most of these urban risks could be reduced in terms of municipal projects, when these urban risk sectors could be included into the determination of the ZDS Tariff, the homeowners could be more aware of urban risks and more willing to participate into community-based risk mitigation projects involved with the reduction of urban risks in their environment. For example, if the homeowners are aware of the risks of hazardous materials, they could influence the change of their place in terms of creating public pressure on local administrations. On the other hand, if the life-lines, open space scarcity risks, and risks involved with emergency facilities are offered ZDS contracts by the ZDS system under the conditions of having urban hazard and risk maps and urban risk mitigation plans, local administrations could have to purchase insurance from the ZDS system. In the case of differentiating the ZDS premiums according to the risk level of these urban risk sectors, the ZDS system could create willingness to purchase insurance for these urban risk sectors.

The urban risk sectors are described in the EMPI (2003) as: *Macro-Form Risks, Urban Texture/Uses, Risks In Life-Lines, Risks In Building Stock, Hazardous Uses, Emergency Facilities, Special Risk Areas, Open Space Scarcity Risks, Risks Related To Hazardous Materials, Vulnerabilities Of Historical And Cultural Heritage, Risks In Lifelines, Risks In Building Stock, Risks Related To Emergency Facilities, External Risks, Snd Risks Of Incapacitated Management* (Balamir 2004b).

B-4. Complementary Strategies to Encourage and/or Enforce Risk Mitigation

B-4.1. Increasing Awareness on earthquake risk and risk mitigation techniques

Although increasing awareness on earthquake risk can cause homeowners to mitigate their risks (Policy Option A-3.2), empirical findings of the Zeytinburnu field survey indicate that perception of homeowners seem not to differ among homeowners in a high risk area. Moreover, higher risk perception level seems not to result in taking risk mitigation measures or purchasing ZDS contracts (Tables 6.31; 6.35 and 6.80). Yet, the insured homeowners' perception of earthquake losses to themselves and perceived probability of earthquake risk seem to be involved with their support for implementing premium discounts in ZDS contracts, in contrast to un-insured households. In addition, higher 'perceived controllability' of earthquakes seem to cause to purchase ZDS contracts and being more willing to take risk mitigation measures (Tables 6.38 and 6.146). Therefore, encouraging risk mitigation in terms of the contractual methods (Policy Option B-2.1) seems to necessitate increasing risk perception level of households, particularly their perceived losses to themselves and the perceived controllability of earthquakes in terms of scientific and technical measures. Yet, having no information on necessary measures could also cause to not taking these measures (Tables 6.84 and 6.85). Thus, increasing risk mitigation necessitates offering homeowners information about risk mitigation techniques and costs. Therefore, homeowners can be informed about risk mitigation techniques in terms of using the information channels at national and local scales (Policy Option A-3.2.1.2 and Policy Option B-4.1.2).

B-4.1.1. National Level Information Sources: The advertisements of ZDS system in news-papers and TV programs and the internet site of the ZDS system can include information about risk mitigation techniques and the institutions that can mitigate these risks, in addition to earthquake risk and ZDS system.

B-4.1.2. Local Level Information Sources

B-4.1.2.1. Using ZDS Contracts: Insurance can increase risk perception level as a mean of risk communication. This is another reason to implement accurately estimated premiums prices and compensation amounts in the ZDS system (Policy Option B-1). However, offering expensive insurance premiums to high risk properties can be insufficient to enforce the people to take risk mitigation measures in voluntary conditions (Kunreuther and Slovic 1978; Li 1998). In addition to the deductibles and coinsurance mechanisms (Policy Option B-2.1), the homeowners can be informed with specific information about the earthquake vulnerability and possible risk mitigation measures in terms of ZDS contracts.

B-4.1.2.2. Preparing Risk Mitigation Brochures/ Pamphlets: Preparing brochures and booklets that explain risk mitigation techniques and the institutions to apply for risk mitigation can be another way to disseminate information. These brochures can be distributed in terms of insurance companies that are authorized to sell ZDS contracts. In addition, these brochures can be given to homeowners during their payment for running costs such as property tax, electricity, water and natural gas.

B- 4.1.2.3. Participation into Urban Risk Mitigation Plans: The new international policy suggests 'public participation' into 'urban risk mitigation plans' can increase the awareness of people for risk mitigation. Therefore, people can be informed about their risks and risk mitigation opportunities in terms of 'Local Risk Mitigation Information Offices' (Policy Option B-4.3.2.2).

B-4.1.3. Compulsory Purchase of the ZDS Contracts

According to country experiences, the insurance techniques, i.e. deductibles and coinsurance mechanisms, can be insufficient to encourage people for risk mitigation in voluntary conditions of risk mitigation and insurance purchase (Kunreuther and Slovic 1978), because these decisions of households influenced by several other factors. For this reason, implementing these methods can necessitate complementary strategies. Likewise, the un-insured households in the Zeytinburnu field survey seem not to believe that risk-rated premiums and premium discounts can encourage risk mitigation. In contrast, insured households believe that risk-rated premiums and premium discounts in retrofitted buildings can encourage risk mitigation, which is related to perceiving purchase of ZDS contracts 'compulsory' (Tables 6.140 and 6.147). Therefore, encouraging and/or forcing homeowners to take risk mitigation measures in terms of discounted risk-rated premiums can necessitate making the purchase of ZDS contracts compulsory. In addition, the findings of Zeytinburnu survey indicate that implementing these contractual methods in compulsory purchase conditions can increase perception of ZDS as a social solidarity mechanism. These two perceived attributes of ZDS system, can also increase purchase of ZDS contracts (Table 6.147).

B-4.2. Providing Access to Safer Land and Residential Areas

High risk property owners are expected to move into safer places instead of paying high-priced ZDS premiums and/or expensive real estate taxes, if contractual methods are implemented (Policy Options B-1.1.2 and B-2.1). However, the Zeytinburnu field survey indicates that both insured and un-insured Hhs do not tend to move in spite of their high risk (Table 6.25). According to the new international policy, if the Hhs at high risk areas could not reduce their risks because of their financial limits, they can be offered the priority for any financial or technical assistance (Policy Options B-4.3 and B-4.4). On the other hand, if the risks are very high and the buildings should be moved into safer places according to land-use plan decisions, households can be supported direct and indirect interventions of local administrations. For instance, the property rights of homeowners can be transferred into safer lands. In addition, owners of high risk properties can be provided loans to move into safer places or to construct their buildings, if they are provided safer lands. Another way can be offering loans to purchase homes in safer residential areas or in newly constructed houses by the State particularly for this purpose (Burby 1999; Godschalk 1998; El -Masri and Tipple 2002).

B-4.3. Providing Access to Risk Mitigation in the Same Building

B-4.3.1. Providing Financial Assistance for Risk Mitigation

According to the theoretical discussions and national experiences, taking mitigation measures can be dependent on homeowner's socio-economic levels. Middle and lower income homeowners that cannot afford risk mitigation measures can be provided long-term credits and loans with low interest rates (Kunruether et al. 2001). This policy option is also supported by all households empirically in the Zeytinburnu field survey. Indeed, this opportunity can provide to collective risk reduction in the housing stock (Table 6.136).

B-4.3.1.1. Providing Risk Mitigation Credits: Instead of providing housing credits after earthquakes, the housing credits of State institutions, e.g. Housing Development Administration of Turkey (TOKI), can be provided for pre-disaster risk mitigation in terms of constitution of housing cooperatives. In addition, Banks can offer 'home improvement loans'. In the case of newly purchased houses, these loans can be offered for a payback period identical to the life of the mortgage (Kleindorfer and Kunreuther 1999).

B-4.3.1.2. Linking Risk Mitigation Credits into ZDS Contracts: Medium-low income homeowners can be encouraged to take risk mitigation credits, if they are offered premium reductions in their insurance contracts (Kleindorfer and Kunreuther 1999). In Turkey, as a financial institution, the ZDS system can

also cooperate with Banks for providing credits and loans for risk mitigation. Therefore, the homeowners that use credits and loans to move into safer places or to mitigate their risks, can be provided also ZDS premium reductions during the repayment period of these loans. Therefore, risk mitigation can be made profitable as soon as the sum of new ZDS premium and risk mitigation loan can be made lower than the previous high ZDS premium (at the high risk property).

B-4.3.1.3. Determination of Credit Types: These credits and loans can vary according to the necessary risk mitigation measure (Kleindorfer and Kunreuther 1999). Risk mitigation type can differ according to urban risk maps and mitigation plans of local administrations such as credits for single buildings, credits for building blocks and/or neighborhoods, and as credits to purchase houses in newly constructed areas (for the homeowners moved into safer places).

B-4.3.1.4. Informing Households about Risk Mitigation Credits: Information about available credits can be provided in terms of local risk mitigation offices (Policy Option B-4.3.2.2). On the other hand, other information sources can be used (Policy Option B-4.1).

B-4.3.1.5. Providing Rent Subsidies during Risk Mitigation: The homeowners can leave their houses during risk mitigation projects. However, they can have difficulties to pay rents in addition to the costs of risk mitigation. Therefore, they can be offered rent-subsidies during the risk mitigation activities in the buildings. According to the Zeytinburnu field survey, both insured and un-insured households expect at least 50% rent subsidies during risk mitigation (Table 6.142).

B-4.3.2. Providing Technical Assistance

Since the ways of risk mitigation can differ according to risk levels, homeowners could be informed about the necessary risk mitigation techniques. Indeed, the Hhs in Zeytinburnu field survey seem to expect technical support for their risk mitigation decisions, because they explained that they do not have knowledge about necessary risk mitigation measures (Table 6.136).

B-4.3.2.1. Determination of Risk Mitigation Options via 'urban risk mitigation plans': Using the urban risk maps, local administrations could decide to implement the type of risk mitigation options. For example, these ways could vary as retrofitting one single building, regeneration of building blocks or neighborhoods and moving into safer places.

B-4.3.2.2. Constituting Local Risk Mitigation Offices via Community-based risk mitigation projects: Technical support to homeowners can be provided in terms of local risk mitigation offices. There can be constituted risk mitigation information offices in the neighborhoods by local administrations. Indeed, social influence and participation into the problems of the neighborhood are found involved with the support of households for policy option of the households in Zeytinburnu (Table 6.22). These offices can also provide information about the ways to implement necessary risk mitigation measures, such as financial opportunities. In terms of 'community based risk mitigation projects', local risk mitigation offices can inform homeowners (Policy Option 3.7).

B-4.4. Determination of Priorities and Social Policies for Risk Mitigation

B-4.4.1. Priority of High Risk Areas: Social responsibility perspective of the new international policy requires giving priority to high risk areas, when the risk mitigation behavior of households in voluntary conditions is observed at very low levels. Risk mitigation of high risk properties cannot be left into voluntary market conditions, when these areas should have priority for technical and financial assistances for risk mitigation.

B-4.4.2. Enforcing High Risk Areas for Risk Mitigation: The homeowners at high risk can be forced to mitigate their risks, if they are not convinced with given priority for the provided technical and financial assistances (Policy Options B-4.2 and B-4.3). The necessity to enforce these homeowners arises from the social responsibility perspective of the new international policy. Secondly, homeowners could not take risk mitigation measures if they are left to voluntary conditions as observed in the national experiences in the world and in the Zeytinburnu field survey (Table 6.79). Enforcing these homeowners could require implementing land-use tools and techniques such as land-acquisition and transfer of ownership rights. In addition, the homeowners could also be forced to take risk mitigation measures in the building according to the Flat Ownership Law (No. 634). The condemned properties could be transformed into open spaces and green areas that could be used as emergency facilities.

B-4.4.3. Providing Access of Low-Income Homeowners to Risk Mitigation Options: Based on the new international policy, the low-income homeowners can have difficulties in accessing risk mitigation measures. If these homeowners have high risk properties, they can be provided priority to access into risk mitigation opportunities (Policy Options B-4.2 and B-4.3). In addition, the new international policy suggests mobilizing national sources and participation of all stakeholders in the society. For example, in Turkey, the State could offer risk mitigation credits in terms of Housing Development Administration of Turkey (TOKI), instead of offering post-disaster State-aid. Indeed, TOKI has such a vision as

constructing houses to low-income households that do not have house. Therefore, the priority could be given to low income homeowners that have high-risk properties. Local administrations could purchase their existing houses, e.g. in terms of land acquisition. Then, the rest of the house value in newly constructed buildings could be paid by these homeowners in terms of long-term credits (Policy Option B-4.2).

B-4.4.4. Priority of Buildings for Long-term Purchased ZDS Contracts: According to the Zeytinburnu field survey, both insured and un-insured homeowners thought that the buildings that purchase ZDS contracts regularly could get technical assistance from municipality for retrofitting their houses. Accordingly, these households could also have priority in getting risk mitigation credits of State and Banks (Table 6.140).

B-4.4.5. Creating 'Urban Risk Mitigation' Opportunities to Include Un-authorized Housing

B-4.4.5.1. Assessment of Earthquake Risk in Un-authorized Housing Stock in terms of Urban Risk Maps: The fair inclusion of this stock into the ZDS system requires assessment and mitigation of their risks. However, since the construction of these buildings and their built environment differs from the authorized housing stock, assessment of the earthquake vulnerability and urban risks can have a different methodology. Despite, the assessment of their risks requires production of urban risk map and makes local administrations responsible. However, including high risk properties into the ZDS system can still threaten its solvency in spite of implementing expensive premiums.

B-4.4.5.2. Creating Urban Risk Mitigation Options for Un-authorized Housing Stock: Inclusion of this stock in to the ZDS system in the case of risk mitigation can provide the efficiency of the ZDS system. According to households' judgments in the Zeytinburnu field survey, fairness in the society could be achieved in this way (Table 6.133). Therefore, to include this housing stock necessitates offering policy options, which require cooperation of ZDS system with local and central administrations, construction firms and building inspection firms as well as the financial sector. Because the un-authorized houses can take place in certain urban areas, their risk mitigation can be implemented through local action plans such as urban regeneration projects, as observed in the METU-ITU approach in the EMPI and Zeytinburnu Regeneration Project. However, other opportunities can also be created for the housing areas that are in better conditions. If the intervention into these areas can be solved at the building or neighborhood scale, therefore, their risks could be mitigated through incentives or enforcements that can be implemented for the authorized houses. On the other hand, the low-income homeowners in this housing stock can be offered risk mitigation policy options (Policy Options B-4.2 and B-4.3).

B-4.5. Certification of Buildings according to Standards of Urban Risk Maps

Country experiences indicate that insurers need to implement 'contractual methods' and 'link contractual methods into long-term banking credits' in terms of 'seal of approval', which proves the acceptable risk level of the buildings according to building codes and other urban risks. In addition, encouraging risk mitigation in terms of banking credits requires 'seal of approval'. These certificates are usually given by local administrations (Kunreuther 1998; 2006). Therefore, implementing contractual methods in the ZDS system requires certification of retrofitted buildings to estimate and monitor the earthquake risk in the housing stock. In addition, implementing risk mitigation in terms of property tax also requires certification of buildings (Policy Option B-2.2). Likewise, banking credits can also be linked into these certificates. In addition, particularly insured Hhs in the Zeytinburnu survey agreed with the certification of retrofitted buildings (Tables 6.136 and 6.137). Therefore, the 'inspection mechanism' of earthquake vulnerability in Turkey can be used for certification of retrofitted buildings, when certification of the buildings can also make easier to monitor the risks in the housing stock (Policy Option Section 4.6).

B-4.6. Inspection of Risks and Monitoring of Changes in Risk Levels

Accurate estimation of risks requires inspecting both the new constructions and existing buildings with the influence of urban environment (Kunreuther 1998). In addition, implementing contractual methods also require to certification of buildings and monitoring the changes in the risk levels in time, which can be achieved inspection mechanisms. However, the ZDS Decree organized inspection of buildings as a 'post-disaster activity' in Article 14. Accordingly, homeowners are found as responsible for the changes in the buildings that caused the increase in the destruction of the building. They loose their right to get a certain amount in compensations in proportion of their blame. However, no implementation of this article is observed.

B-4.6.1. Emphasizing Pre-Disaster Activities: In Article 14 in the ZDS Decree, inspection of failures is left to post-disaster process. However, understanding the failures in the construction can be difficult after the building is collapsed. Instead, monitoring failures and changes in the building and in the environment before earthquakes can provide to envisage coinsurance and deductible mechanisms. Therefore, homeowners can be encouraged or forced to give information and to take risk mitigation measures. In addition, not only the homeowners, but also other responsible of the deficiencies, e.g. engineering firms, developers, can share the responsibility of risk mitigation costs.

B-4.6.2. Organizing Responsibilities: According to the existing ZDS system, only homeowners are responsible for the changes in the buildings. Instead, the responsibilities can be organized, because the deficiencies in the building can be because of the construction process by engineers and developers. In addition, the building inspection firms and local administrations can also be made responsible for their failures during monitoring the changes. For this reason, a building inspection mechanism is necessary to organize responsibilities. Therefore, not only the homeowners can be responsible and be offered lower compensation amounts.

B-4.6.3. Integrating Building Inspection Mechanism into ZDS system: In Turkey, the Building Supervision Law gives the task of inspection to Building Inspection Firms, when local administrations monitor their activities. ZDS can cooperate with these firms and local administrations to inspect the new constructions and changes in the existing buildings, including the risk mitigation activities. However, this inspection should not be limited with building risks, but should also consider urban risks. In return of this service, local administrations can be paid by ZDS system appropriately. Thus, the building inspection mechanism in Turkey should be reorganized for these tasks, by drawing liabilities of construction firms, building inspection firms and local administrations. In the case of extending the scope of ZDS system into urban hazards and risks, eg. urban risk sectors, households could also constitute public pressure on local administrations to reduce the risks in the hazardous areas and/or lifelines, etc.

B-4.7. Community-based Risk Mitigation Projects

The new international policy suggests that people can be motivated for risk reduction in terms of participating risk reduction activities. Indeed, this option can provide collective risk reduction in the housing stock. In addition, the national resources should be mobilized toward risk mitigation to enhance socio-economic capacities at all levels (UN/ISDR 2004). According to empirical findings of the Zeytinburnu study, perceived controllability of earthquakes is involved with the participation of households into activities in their neighborhoods to solve the problems, when these households are more wiling to take risk mitigation measures (Table 6.22). In the similar way, land-use planning is involved with citizens and community participation programs to reduce risk from a bottom-up approach (Burby 1999). On the other hand, priorities for risk mitigation and risk mitigation opportunities can be determined in terms of urban risk maps and risk mitigation plans of community-based projects. In Turkey, community-based risk mitigation projects can be developed and applied by local administrations because of their authority to implement urban plans. The ITU-METU approach in the Earthquake Master Plan of Istanbul has proposed ‘urban regeneration local action plans’ as developed for Zeytinburnu pilot project area. To implement the local action plans in terms of active

participation of homeowners, therefore, the financial and technical capacity of local administrations should be enhanced.

7.1.4. Evaluation of Policy Options for Risk Reduction

According to the new international policy, increasing public awareness can be insufficient to encourage risk mitigation among households, when policies to motivate risk mitigation are essential. However, country experiences in the world indicate that contractual methods of insurers can fail to encourage homeowners to take risk mitigation measures extensively. Based on the assessment of various policy options, encouragement of risk mitigation in voluntary conditions seems to be insufficient for extensive risk mitigation, even if awareness for risk reduction is increased. Instead, extensive risk mitigation necessitates creation of opportunities and determination of priorities in a socially responsible way. When 'urban planning' is suggested as the appropriate way to reduce the risks and prevent the failures in market conditions by the new international policy, extensive risk reduction in the society without wasting public resources seems to be achieved by means of 'community based risk mitigation projects' (Policy Option B-4.7).

The scope of community-based risk mitigation projects could be determined in 'urban risk mitigation plans', which necessitate production of urban hazard and risk maps (Policy Option B-1.1) that can be produced as stand-alone products or as integrated into development plans. Local governments are usually authorized to produce these maps. Including urban risk maps into development plans has particular benefits in integrating mitigation into goals of the communities, limiting settlements in hazardous areas, reducing the risk in the existing urban areas. This approach also increases hazard awareness in the community (Godschalk et al. 1998). Integration of risk reduction into urban planning is also the priority of the new international policy of disaster reduction (UN/ISDR 2004). In Turkey, production of urban plans is among the tasks of the local administrations, i.e. municipalities. The existing Development Law (No. 3194), the Law regenerating such situations, is criticized because of not including the earthquake safety elements, when municipalities usually lack technical and financial tools to reduce the vulnerability in urban areas (Balamir 2005). The Earthquake Master Plan of Istanbul also provides guidelines to implement community based risk mitigation projects as 'Urban Regeneration Local Action Plans', as observed in Zeytinburnu pilot project.

If urban hazard and risk maps are produced and integrated into development plans, local administrations in Turkey could determine high risk areas as prior for risk reduction and appropriate risk mitigation options according to different risk levels and targeted groups. At local level, local risk

mitigation offices, therefore, could have more essential roles beyond providing technical assistance to homeowners as organization and management of the 'urban risk mitigation plan decisions'. When high risk property owners can be forced to move into safer areas in terms of providing safer land and residential areas, provision of safer land and residential areas in an organized manner can prevent waste of public resources (Policy Option B-4.2.3). Social inequalities could also be prevented in terms of community based risk mitigation projects. In addition to determination of low-income households in accessing varying risk mitigation options (Policy Option A-4.4), risk reduction in the un-authorized housing stock and their fair inclusion into the financial protection of the ZDS system could also be achieved (Policy Option B-4.4.5).

Thus, the ZDS system is also in need of 'urban hazard and risk maps' that can be produced by local administrations. Using urban hazard and risk maps can reduce the risk of the ZDS system in terms of providing the necessary scientific information for accurate estimation of possible earthquake losses and the influence of other hazards and urban risks. In addition, extension of the coverage of the ZDS system into other urban hazards and risks could provide the ZDS system to diversify its risks across the country. Moreover, by means of 'list of safety variables' that can be obtained from urban hazard and risk maps, the ZDS system could select the low risk buildings to insure; and therefore diminish its potential losses.

Preventing social inequalities due to exclusions of high risk buildings and un-authorized housing stock, the ZDS system needs also implementation of 'community-based risk mitigation projects' at local levels (Policy Option B-4.7). Since reducing the risk of high risk properties cannot be left into voluntary decisions, only after the determination of risk mitigation priorities and options through 'community-based risk mitigation projects', the contractual methods and ZDS system seem to be an additional mechanism to encourage risk mitigation. Indeed, the ZDS Tariff -at urban level with the same standards across the country- could provide implementing accurately estimated risk-rated premiums and contractual methods that can encourage homeowners for risk mitigation (Policy Option B-2.1).

Contribution of the ZDS system could be in terms of linking the 'list of safety variables' in ZDS Tariff (Policy Option B-1.3.) into construction practices that necessitates creation of mechanisms for 'certification of buildings with low risk' and for 'inspection and monitoring of urban risks in the existing building stock and new constructions' (Policy Options B-4-5 and B-4-6). Implementation of these mechanisms requires the assistance of local administrations regarding urban risk maps. In this way, the ZDS Tariff and contracts could also be linked into 'risk mitigation credits', which could be offered to homeowners for encouraging them to take risk mitigation measures (Policy Option B-4.3). In addition

to offering risk-rated ZDS premiums as linked to the construction practices, the homeowners that purchase ZDS contracts regularly could also be offered priority in accessing risk mitigation credits (Policy Option B-4.4).

7.2. PROPOSALS FOR URBAN RISK MANAGEMENT WITH THE ZDS SYSTEM

Based on the assessment of policy options, extensive 'risk mitigation' seem to be the suitable way to provide both the efficiency and social equity of the ZDS system, instead of increasing only the penetration ratio. Since using sole insurance techniques, i.e. risk-rated premiums and contractual methods, in the ZDS system seem to be insufficient for extensive risk mitigation, the ZDS system is in need of complementary risk reduction policies, which could be achieved in terms of active roles of 'local administrations'. Yet, the local administrations are limited in technical and financial capacities for both extensive risk reduction in society and enhance the capacity of the ZDS system. H

owever, the new international policy emphasizes creation of resilience against natural disasters in terms enhancing socio-spatial capacities for risk reduction (UN/ISDR 2004). The policy options discussed here indicated that enhancing the capacity of the ZDS system requires enhancing the capacity of the local administrations. Their collaboration can result not only in the efficiency and equity of the ZDS system, but the 'resilience' of the country against earthquakes. As found in the Zeytinburnu field survey, the way to eliminate the fatalistic attitude of homeowners and to create a resilient society seem to be dependent on the constitution of a social solidarity mechanism by ZDS system in terms of supporting risk reduction opportunities. Hence, it is necessary to make a number of proposals for the collaboration of local administrations and the ZDS system.

7.2.1. Administrative and Organizational Proposals

Based on the discussed policy options here, the ZDS system could collaborate with local administrations in terms of two ways, which are involved with each other as:

1. Constituting 'ZDS Grant Program' by the ZDS System
2. Contribution of ZDS System into 'Risk Mitigation Fund'

7.2.1.1. ZDS Grant Program: Collaboration with Local Administrations

The direct collaboration of the ZDS system with local administrations seems to be in terms of creating a 'ZDS Grant Program' through which the ZDS system could contribute to the efforts of local administrations that are particularly involved with the efficiency and social equity in the ZDS system. In addition to its collaboration with private insurance companies and agents, the ZDS system could cooperate with local administrations by means of organizing and supporting the creditable activities of local administrations in the framework of the 'ZDS Grant Program'. As observed in the National Flood Insurance Program (NFIP) in USA, hazard insurance pools can pay for creditable efforts of local administrations such as increasing public awareness, mapping the hazard risk, damage reduction and preparedness (NFIP 2002).

insurance. To implement NFIP, federal, state and local governments are required to cooperate with each other and private insurance industry (NFIP 2002). For the ZDS system, risk reduction seems to be the prior necessity. 'Urban hazard and risk maps' could provide the ZDS system to obtain the necessary information in the estimation of the potential losses, and could extend the coverage of the ZDS system into other urban hazards and risks. In this way, the ZDS premiums and compensations could be determined based on the accurately estimated risk-rated ZDS Tariff, which could provide offering contractual methods, i.e. deductible and co-insurance mechanisms.

When offering incentives could encourage risk mitigation at the homeowner level, changing the ZDS Tariff of the retrofitted buildings requires offering inspection and certification of the buildings, which can be another creditable activity of the local administrations. Since the extensive risk mitigation could be achieved by production and implementation of urban risk mitigation plans and 'urban regeneration local action plans', these could be further creditable activities of local administrations by the ZDS system. With respect to increasing the penetration ratio, local administrations can also contribute to the ZDS system through 'requirement of the ZDS contracts with property tax and during various municipal services'. In addition, local administrations could improve their property registries in cooperation with Title Deeds Offices, e.g. through TAKBİS project. On the other hand, sharing the information on the urban hazards and risk maps, risk mitigation efforts, sold ZDS contracts and property registries with the ZDS system, local administrations should establish an 'urban information database', which could be another creditable activity. NFIP implements a 'Community Grant System' to offer incentives to local administrations in terms of three ways as 1) floodplain identification and mapping; 2) floodplain management; and 3) flood insurance.

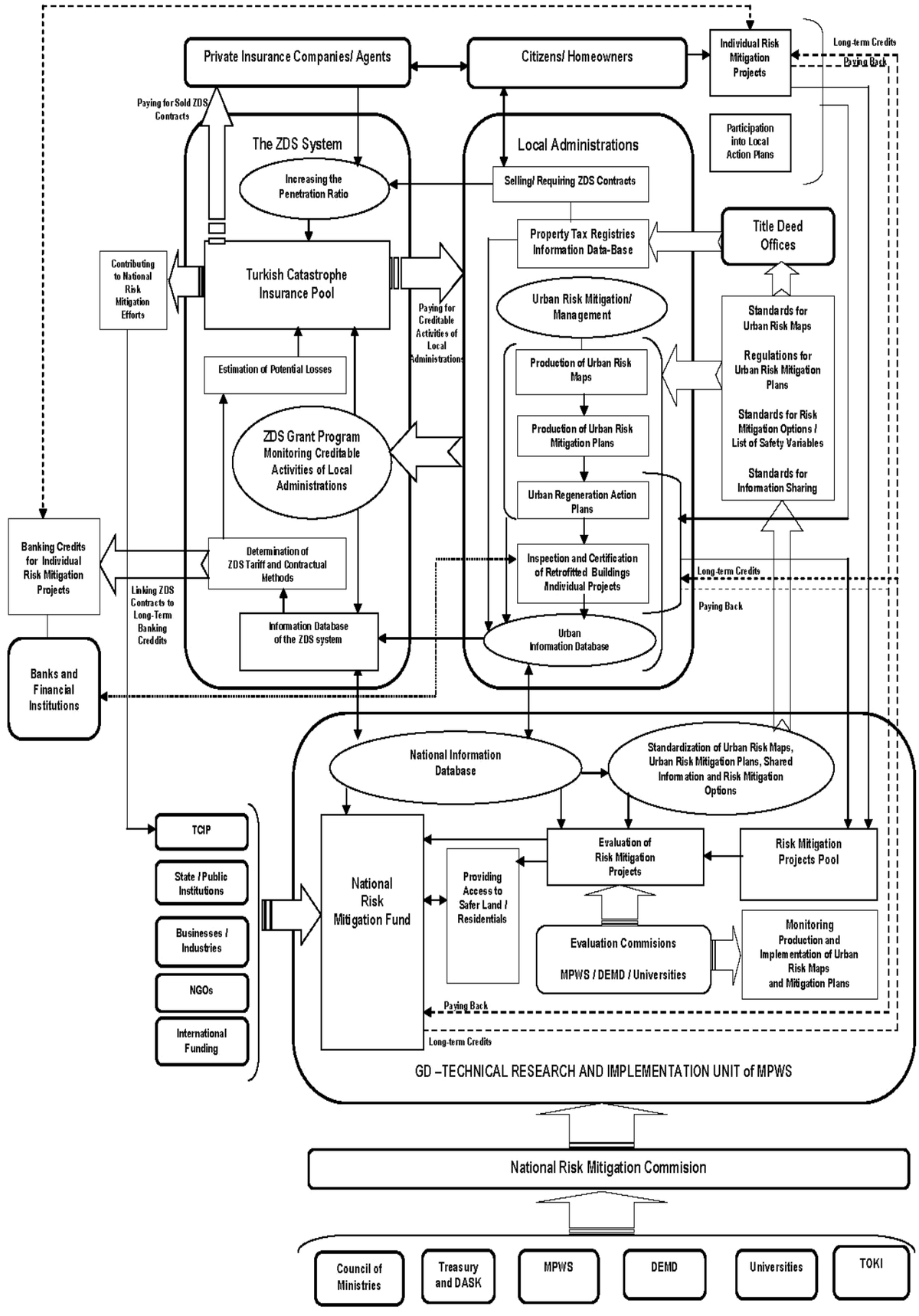


Figure 7.1. Proposed System for Urban Risk Management with the ZDS System

Hence, these creditable activities of local administrations to be rated and granted by the ZDS system could be as follows:

- Increasing the Penetration Ratio and Monitoring the Property Registries
  - Selling/ Requiring ZDS Contracts during Property Tax Payments/ Municipal Services
  - Improving the Property Registries in cooperation with Title Deeds Offices
- Risk Reduction in Urban Areas
  - Production of 'Urban Hazard and Risk Maps'
  - Production of 'Urban Risk Mitigation Plans'
  - Implementation of 'Local Community-based Risk Mitigation Projects
  - Inspection and Certification of Retrofitted Buildings by Homeowners
  - Inspection of New Constructions
  - Inspection and Monitoring the Urban Risks
- Establishment of Urban Information Database and Sharing Information on
  - Insured Houses
  - Property Registries
  - Risk Reduction Activities

Offering incentives to these efforts of local administrations, the ZDS system could envisage and develop 'the ZDS Grant Program' through which local administrations could be rated based on the accomplished activities. This collaboration could be started in terms of paying commissions for the increased penetration ratio of the ZDS system by local administrations. In the next stage, the Municipalities with higher penetration ratio could be encouraged to establish 'urban information database', which could include the information on sold ZDS contracts and property tax registries at the beginning. Therefore, local administrations could cooperate with Title Deeds Offices. In addition to increased penetration ratio and monitoring the eligible homeowners, the property tax registries could be used by the ZDS system to determine the low-income homeowners that are already exempt from paying the property tax. In this way, the targeted groups in authorized housing stock could be offered 'subsidized ZDS premiums' by the ZDS system.

The ZDS system could encourage local administrations in establishing urban information database in terms providing credits from TCIP to the municipalities with higher penetration ratio in their jurisdictions and insuring the main municipal building. In addition, the ZDS system could provide the

Municipalities priority in accessing into the credits that could be offered for the establishment of information database by the State, International Funding and Banks. Priority could also be determined according to the higher penetration ratio in the jurisdictions of Municipalities.

The next task of the ZDS system could be encouraging local administrations to produce 'urban hazard and risk maps'. The credits and incentives therefore could be offered to the municipalities that have higher penetration ratio and an urban information database. The local administrations with urban hazard and risk maps, therefore, could be supported to share this information with the ZDS system in terms of urban information database. Therefore, the ZDS system could reach more accurate information on urban hazard and risks, when it can extend the coverage of the ZDS contracts to other urban hazards and risks. As the information database could be improved by the local administrations in terms of linking this 'property registries' with 'urban risk maps', the ZDS system could monitor the risks in the housing stock and eligible homeowners to purchase ZDS. In addition, the ZDS system could determine the priorities to offer 'subsidized premiums in high risk areas. On the other hand, improving the property tax registries of local administrations with respect to un-authorized houses, the ZDS system can also offer subsidized premiums to low-income homeowners in this housing stock. The ways to promote production of urban hazard and risk maps and their integration into urban information database could include offering credits from TCIP, insuring other municipal buildings, providing priority in accessing into credits that could be offered for production of urban risk maps and sharing them on information database by the State, International Funding and Banks. Priority could also be determined according to the rates of municipalities in the ZDS Grant Program.

In the next stage, the ZDS system could promote 'the production of urban risk mitigation plans' and 'share of these plans on the urban information database' by local administrations. In this way, the prior areas for risk mitigation and risk mitigation types in local action plan areas could be determined by local administrations. In addition to offering credits from TCIP, municipalities could be encouraged to produce urban risk mitigation plans in terms of offering ZDS contracts other municipal buildings and public buildings in the municipal jurisdictions by the ZDS system. In addition, the municipalities could be offered priority in accessing credits that could be offered for production of urban risk maps and sharing them on information database by the State and International Funding and Banks.

As urban risk mitigation plans of local administrations could be implemented in terms of 'local action plans', the ZDS system could encourage the implementation of local action plans in the next stage. Since the extent and type of risk mitigation could differ from moving into safer areas to retrofitting the buildings, the support of the ZDS system could also differ according to the extent and type of risk

mitigation. In other words, the ZDS system could encourage local administrations and homeowners. Local administrations could be encouraged by the ZDS system by offering credits from TCIP, insuring other municipal buildings, insuring public buildings in the municipal jurisdictions and providing priority in accessing into credits that could be offered for implementation of local action plans by the State and International Funding and Banks.

After the encouragement of local administrations to implement local action plans, homeowners could also be encouraged in terms of more expensive ZDS premiums to enforce and/or encourage homeowners with high risk properties according to the shared information of local action plans on the information database. For the individual projects of homeowners as retrofitting the building, homeowners could be offered by the ZDS system long-term risk mitigation credits of Banks and the State as linked to the ZDS contracts. With this information database, the ZDS system could also determine the priorities of homeowners in accessing risk mitigation according to their risk and income levels depending on the property tax registries and urban risk maps, mitigation plans in the shared information database. Therefore, homeowners could be provided priorities in accessing long-term risk mitigation credits of Banks and the State as linked to the ZDS contracts. Likewise, the regular purchasers of ZDS contracts could also be offered priority for risk mitigation credits. In this way, the ZDS system could also encourage individual risk mitigation projects of homeowners by providing long-term credits, premium reductions and co-insurance mechanisms and rental assistance during risk mitigation activities.

On the other hand, implementing the deductible and co-insurance mechanisms and their link into State-Bank credits necessitate inspection and certification of individual risk reduction efforts of homeowners by local administrations. For their efforts in inspection and certification of retrofitted buildings, local administrations could be provided incentives by the ZDS system. However, encouraging local administrations for these efforts necessitates also a monitoring mechanism at the national level. In risk reduction stage, the municipalities could be encouraged to reduce the risks of emergency facilities (e.g. hospitals, infrastructure, and schools), municipal buildings and other public buildings depending on their higher rates in the ZDS Grant Program, particularly the credits for reduced risk levels and implemented risk mitigation projects. The ways to encourage municipalities could be providing deductibles in ZDS contracts of the municipal buildings in the case of retrofitting these emergency facilities and public buildings. Another way could be providing priorities in accessing to the credits that could be offered for risk mitigation in the public buildings by the State and International Funding and Banks.

Within the ZDS Grant Program, the ZDS system could offer local administrations incentives according to their efforts in creditable activities in a sequence such as:

1- Paying Commissions for the Increased Penetration Ratio

2- Encouraging the Municipalities to Establish Urban Information Database if they have High Rates in ZDS Grant Program because of high penetration ratio in their jurisdictions (at the beginning this information database could include information on property tax-registries). The ways to encourage could include:
    a. Offering Credits from TCIP to the Municipalities
    b. Insuring the main Municipal Building
    c. Providing priority in accessing into the State and Bank credits for the establishment of information database

3- Encouraging the Municipalities for (1) the production of 'urban hazard and risk maps' and for (2) 'sharing the urban hazard and risk maps' on the 'urban information database' if they have high rates in ZDS Grant Program because of (a) high penetration ratio and b) establishing urban information database.
    a. Offering Credits from TCIP to the Municipalities
    b. Insuring other 'municipal buildings'
    c. Providing priority in accessing into credits that could be offered for production of urban risk maps and sharing them on information database by the State and International Funding and Banks.

4- Encouraging the Municipalities for the production of 'urban risk mitigation plans' and their share on the urban information database if they have high rates in ZDS Grant Program because of (a) high penetration ratio and (b) urban information database and (c) urban hazard and risk maps.
    a. Offering Credits from TCIP to the Municipalities
    b. Insuring other Municipal Buildings
    c. Insuring Public Buildings in the municipal jurisdictions
    d. Providing priority in accessing into credits that could be offered for production of urban risk maps and sharing them on information database by the State and International Funding and Banks.

5- Encouraging the Municipalities for the production and implementation of the 'urban regeneration local action plans' if they have high rates in ZDS Grant Program because of (a) high penetration ratio and (b) urban information database and (c) urban hazard and risk maps and (d) urban risk mitigation plans
    a. Offering Credits from TCIP to the Municipalities
    b. Insuring other Municipal Buildings
    c. Insuring Public Buildings in the municipal jurisdictions
    d. Providing priority in accessing into credits that could be offered for implementation of local action plans by the State and International Funding and Banks.

6- Encouraging and/or enforcing homeowners for risk mitigation within the jurisdictions of Municipalities that have high rates in ZDS Grant Program because of (a) high penetration ratio and (b) urban information database and (c) urban hazard and risk maps, (d) urban risk mitigation plans and (e) 'urban regeneration local action plans'
    a. Offering deductible and co-insurance mechanisms according to risk levels
    b. Linking ZDS contracts, i.e. deductible and co-insurance mechanisms, into risk mitigation credits of State and Banks
    c. Providing priority to homeowners in accessing to the State-Bank credits for risk mitigation
        i. According to risk level (priority to high risk properties)
        ii. According to income level
        iii. Regular Purchase of ZDS contracts

7- Encouraging municipalities to inspect and certify the retrofitted buildings in terms of establishing monitoring mechanisms to audit the inspection activities of municipalities.
    a. Offering Credits from TCIP to the Municipalities
    b. Insuring other Municipal Buildings
    c. Insuring Public Buildings in the municipal jurisdictions
    d. Providing priority in accessing into credits that could be offered for implementation of local action plans by the State and International Funding and Banks.

8- Encouraging Municipalities to reduce the risks of emergency facilities, municipal buildings and other public buildings, if the municipalities have higher rates on ZDS Grant Program, particularly depending on risk reduction efforts.

   a. Providing Deductibles in ZDS Contracts of the Municipal Buildings and Other Public Buildings for the Municipalities that have retrofitted these Buildings
   b. Providing ZDS contracts for the retrofitted infrastructure
   c. Providing priorities in accessing to the risk mitigation credits that could be offered by the State, International Funding and Banks.

7.2.1.2. Contribution of the ZDS System into 'Risk Mitigation Fund': Collaboration with Central Administrations

Implementing the ZDS Grant Program require collaboration of the ZDS system with central administrations. Firstly, production of urban hazard and risk maps, urban risk mitigation plans, and their implementation through urban regeneration local action plans necessitate 'standardization of urban hazard and risk maps and urban risk mitigation options/ regulations'. Such a necessity is already observed and implemented in the NFIP, which supports local governments for their efforts in 'risk identification and assessments' in terms of 'standardized maps and regulations' (NFIP 2002). The standards of NFIP are set by national government (FEMA) through land use regulations and building codes to mitigate the risks. The national government assumes the risks, when setting premiums (Freeman et al. 2003:23). In Turkey, 'determination of standards' was also discussed as necessary to enhance the technical capacities of local administrations (Balamir 2005; Appendix B). To determine the standards and regulations, an independent technical commission could be constituted at the national level, which is called here as 'National Risk Mitigation Commission' (NRMC). According to the organizational structure of disaster policy in Turkey, the NRMC could encompass the central authorities involved with the pre-disaster activities and insurance such as the Ministry of Public Works (MPWS), the Disaster and Emergency Management Directorate (DEMD), the Treasury and Council of Ministries.

Particularly, the MPWS is responsible for the implementation of the Development Law (No. 3194), when the task of taken measures is given to MPWS in the 9th Article of the Development Law. Moreover, 'the General Directorate of Technical Research and Implementation' (GD-TRU) of MPWS is responsible for the training, research, planning and implementation about the natural disasters. In other words, GD-TRU seems to be the most appropriate institution to have the technical responsibility for risk determination of 'urban hazard and risk maps' and 'urban mitigation plans'. GD-TRU of MPWS has also accepted the perspective of the new international policy. That is, the GD-TRU of MPWS could be expanded to manage the activities of 'national risk mitigation'.

GD-TRU could collaborate with 'the Planning and Mitigation Department' (PMD) and 'the Earthquake Department' (ED) of DEMD. Indeed, PMD of DEMD is to be responsible for the intervention on natural disasters and emergency through national plans, national risk management and mitigation plans, and developing insurance services. ED of DEMD, on the other hand, is to be dealt with activities before and after earthquakes such as earthquake risk management and mitigation plans, public works, and development plans and projects. However, these are newly established agents of the State. During the standardization of urban risk maps and risk mitigation plans, the Treasury could collaborate with the GD-TRU of MPWS, and PMD and ED of DEMD for the determination of 'safety variables', 'ZDS Tariff' and 'estimation of potential losses' that are necessary to implement insurance techniques. Other stakeholders could be Geological and Geophysical Research Institutions, the Treasury of Prime Ministry and the DASK. In addition, the creditable regulations of urban risk mitigation plans by the ZDS Grant Program could also be determined in collaboration.

For the standardization of urban hazard and risk maps and urban risk mitigation plans, and monitoring their implementations, local administrations could store and share the urban information database by linking into a 'national information database', which can be directed by GD-TRU of MPWS and shared by the ZDS system. Since the standards of urban risk maps and regulations of urban risk mitigation plans could be revised in time and the risks in the urban areas could change in time, the GD-TRU of MPWS could require the update and/or revision of microzonation maps, urban risk maps, and urban risk mitigation plans by local administrations. Monitoring risk levels through urban risk maps of local administrations, the GD-TRU of MPWS could determine the prior areas for risk mitigation at the national level according to risk levels. Public resources, therefore, could be allocated based on these priorities across the country. Then, access of high risk property owners to safer land and residential areas could be provided in terms of collaboration of local administrations with Housing Development Administration of Turkey (TOKI). Likewise, long-term State-credits for risk mitigation could also be

provided according to these priorities in collaboration of TOKI and the Bank of Provinces that is directed by the MPWS.

As observed, the collaboration of the ZDS system with local administrations necessitates the efforts of GD-TRU of MPWS for the standardization of information and reduction of risks. These efforts of the GD-TRU of MPWS could be rewarded by the ZDS system in terms of contributing to the national 'Risk Mitigation Fund' (RMF). Indeed, the contribution of the ZDS system into a national level risk mitigation fund was discussed in Turkey as necessary to support risk mitigation activities of 'local administrations' in terms of incentives and/or sanctions for their risk mitigation efforts. (Balamir 2004a; Kıral 2004). Likewise, the Risk Mitigation 'Acts' and 'Grant Programs' are used to enhance the technical and financial capacities of local communities in the world. For example, the Hazard Mitigation Grant Program and the Disaster Mitigation Act in USA (DMA 2000) provides such contributions into risk mitigation activities of local administrations. In addition, contribution of funds for risk mitigation is also necessary from the new international policy framework. Therefore, sharing the same information database at the national level, the GD-TRU of MPWS could organize and manage the activities and sources of the RMF. Establishing risk mitigation project pool and commissions to evaluate the risk mitigation projects seem to be other necessary tasks as already noted by Balamir (2004a). Monitoring the risk mitigation activities of local administrations via local action plans and certification of individually retrofitted buildings, therefore, could also be achieved by the GD-TRU of MPWS. In addition, the individual risk mitigation projects of the homeowners could also be financed from RMF. In accessing these credits, the ZDS Grant Program could provide priorities to homeowners within the boundaries of the municipalities that participate into the ZDS Grant Program.

Therefore, the tasks to be done by the central authorities could be:

1- Standardization of the Safety and Risk Elements in Urban Hazard and Risk Maps
2- Standardization of the Regulations in Urban Risk Mitigation Plans
3- Establishment of a National Information Database
4- Enhancement of the Authorities and Capacities of the General Directorate of Technical Research and Implementation Unit of MPWS
5- Establishment of a National Risk Mitigation Commission
6- Establishment of Risk Mitigation Project Pools
7- Establishment of Evaluation Commissions
8- Establishment of Monitoring Mechanisms
9- Establishment of Risk Mitigation Fund

The contributors of the RMF at the national and international levels could be:

The State: The RMF can enable local administrations to strengthen public assets and emergency facilities (i.e. infrastructure, hospitals, schools, etc.), and therefore, to increase the financial losses of the State after earthquakes. In addition, lack of risk mitigation can cause higher losses in the housing stock, when the ZDS system becomes insolvent. However, contributing to risk mitigation before the earthquakes can prevent the continuity of State assistance to earthquake survivors. For this reason, the State could also contribute to the RMS from its annual budget.

NGOs: Many NGOs assisted in construction of houses, as observed after 1999 Marmara Earthquakes. Instead of post-disaster construction, these NGOs could contribute to the RMF.

Businesses, Capital Owners and Industries: As other essential stakeholders of the society, businesses and/ or capital owners in the country can also suffer from the destruction of earthquakes in public spaces and in the housing areas. Particularly, strengthening the infrastructure, i.e. transportation systems can prevent their losses, when strengthening housing areas can prevent loss of qualified workers. On the other hand, social responsibility perspective and mobilization of national resources makes them also involved with risk mitigation in public spaces.

The international Funding: The new international policy suggests that risk mitigation activities should be contributed by international funds in terms of mobilization of resources in the world. Therefore, the international funds, such as the World Bank and European Investment Bank to the RMS can contribute to the RMF.

The ZDS system: When the ZDS system could share the same information database for granting the local administrations' projects, the individual risk mitigation projects of homeowners could also be supported by this central RMF. Therefore, the ZDS system could also distinguish the homeowners to offer risk mitigation credits in terms of Banks or the State, i.e. RMF. Indeed, the ZDS system can constitute a great resource with large amount of savings from compulsory regulation of insurance premiums through local administrations. However, the financial burden of the ZDS system can be decreased in terms of risk mitigation. Therefore, local administrations are enabled for risk mitigation, particularly in the housing stock, the ZDS system can also contribute to RMF at a rate of its annual revenue.

Indeed, the ZDS system was investing in reinsurance nearly 50% of its revenue at the beginning (TBMM 2000). According to the Activity Report of DASK (2008), the reinsurance investment constitutes nearly 36% of its annual revenue (Table 4.3 in this dissertation). The ZDS system paid nearly 80.000.000 TL to the reinsurance premiums for 2.676.000.000 TL reinsurance protection, which costs nearly 33 times more than its reinsurance premiums. If the actuarial risk of one house is approximately 52.000 TL, this means that reinsurance protection is purchased for nearly 51.460 houses (Reinsurance protection/ average compensation amount per house). If the ZDS system allocates 15% of its premium revenue (219.355.000 TL in 2008) to create a system that can enable local administrations for risk mitigation, this amount could constitute nearly 33 million TL. If the ZDS system could transfer 33 million TL since its introduction, its investment in risk mitigation could be nearly 330 million TL in 2008 prices. When the ZDS system currently determines the average compensation amount as 52.000 TL, its investment of 342 million TL could mean reduction of risks in nearly 6300 houses and saving of nearly 25.000 lives (assumed 4 person per household). Since the ZDS pays 80 million TL for nearly 51.460 houses, in the case of mitigated risks in 6300 houses, the ZDS system could pay 70.000.000 TL for reinsurance premiums, which means nearly 12.5% reduction in reinsurance premiums.

If all stakeholders could contribute to RMF with nearly 33 million TL annually, the RMF could accumulate 132 million TL in one year (in 2008 prices). Assuming that the cost of risk reduction in one house as 52.000 TL (equal to the compensation amount), earthquake risk of 2.500 houses could be reduced in one year, when the reinsurance premiums of the ZDS system could be reduced nearly 5% (4.000.000 TL) in one year. In addition, the use of accumulation of RMS for risk reduction could result in reduction of risks in nearly 25.000 houses in 10 years, which indicates 50% reduction in reinsurance premiums. Considering the long-term Bank credits for individual risk mitigation efforts of homeowners, risk reduction in the society could reach 35.000 houses in the buildig stock, which means nearly 68% reduction in reinsurance premiums. This estimation indicates that the proposed risk mitigation mechanism for the ZDS system in collaboration with local and central administrations could be used to reduce the risks of life-lines and emergency facilities in urban areas in a few years.

Hence, the ZDS system could lead to start this national risk mitigation mechanism by transferring 15% of its annual premium revenue into RMF, and at the beginning to invest in the establishment of the national information database and/or encourage local administrations to establish their urban information database. The ZDS system could also monitor the establishment of national level risk mitigation activities in turn of its investment, i.e. the necessary steps, i.e. the studies of standardization of urban risk maps and risk mitigation plans.

Then, the local administrations could be provided commissions as explained in the ZDS Grant Program. According to the Activity Report of DASK, the commissions paid to the insurance companies costs nearly 15% of the annual revenue of DASK. Likewise, the 15% of the annual revenues of the ZDS system could be used for paying commissions to the efforts of local administrations.

After one year, rating the increased penetration ratio in the jurisdictions of municipalities, transferred 5% of annual premium revenues could be spend to the establishment of urban information database by the municipalities. The rest of risk mitigation share, i.e 10% of annual revenues, could therefore be used to contribute into RMF. With other incentives that could be offered by the ZDS system to local administrations in ZDS Grant Program and to RMF, risk mitigation in the housing stock could extend across the country in a few years. Therefore, the ZDS system could reduce its risks, require less reinsurance and create resilience and solidarity in the society against earthquakes and other natural disasters and urban risks.

7.2.2. Proposals to Accommodate Changes in the Legal System

Certain changes in the legal system are necessary to implement the proposed administrative organization, particulary for the ZDS (Draft) Law and the Development Law (No. 7269).

7.2.2.1. Proposals for the ZDS Draft Law

The ZDS Draft Law could be enacted with changes in the current Draft Law (2008; Appendix A):

1) The statement of 'various disasters and risks' in the the Article 1 could changes as 'various urban hazards and urban risks'.

2) The Definitions in Article 2 could include 'urban hazard and risks', 'urban hazard and risk maps' 'urban risk mitigation plans', 'urban regeneration local action plans', 'the ZDS Grant Program', 'urban information database', 'national information database', 'emergency facilities', 'National Risk Mitigation Commision' (NRMC), 'the General Directorate of the Technical Research and Implementation Unit of the Ministry of Public Works and Settlement' (GD-TRU of MPWS) and 'Risk Mitigation Fund' (RMF).

3) The Article 5, which defines the tasks of 'the Board of Directors' could include one more provision as: "(9) Deciding the implementation of ZDS Grant Program to collaborate with local administrations by providing incentives".

4) The Article 9, which defines the expenses of the ZDS System, could include three provisions in the third provision as: "(h) contributing to the creditable activities of local administrations in terms of ZDS Grant Program; and (i) contributing to activities of the central authorities that enable local administrations participating into the ZDS Grant Program in terms of paying to the risk mitigation fund".

5) The Article 10, which defines the coverage and obligations to purchase ZDS contracts, could include one more sentence in provision (3) as: "The apartment managers are responsible to purchase ZDS contracts, if the homeowners do not purchase. Apartment managers are to collect the cost of ZDS premiums from these homeowners based on their authorization in the Flat Ownership Law (No. 634)"

6) The Article 10 can include two more sentences in provision (4) as:

"The Institution (DASK) can decide to exclude these vulnerable buildings from the ZDS system based on the the ZDS Tariff that is to be produced in terms of 'urban hazard and risk maps' and shared with the ZDS system by local administrations via the ZDS Grant Program as explained in Article 13"

7) The Article 10 can include two more sentences in provision (4) as:

a. "The excluded buildings from the ZDS system- that have Land Title-Deeds or not- can be included into the ZDS system if their risks are mitigated in terms of 'urban regeneration action plans' and/or 'individual efforts of homeowners' within the jurisdictions of municipalities that are participated into the ZDS Grant Program. The buildings with Land-Title Deeds are to be given priorities in risk mitigation grants that are described in Article 10-4-b."

b. "To include these excluded building stock, the ZDS system can encourage municipalities and homeowners in terms of ZDS Grant Program."

   i. "Municipalities that participated to the ZDS Grant Program can be encouraged to produce and implement 'urban risk mitigation plans' and 'local action plans', and 'sharing this information on the urban information database (in Article 11) with the ZDS system and with 'national information database' that is directed by the 'GD-TRU of MPWS', if the municipalities have higher rates in ZDS Grant Program according to (a) high penetration

ratio and (b) urban information database and (c) urban hazard and risk maps. The ZDS system can encourage these municipalities in terms of:

1. Offering Credits from TCIP to the Municipalities
2. Insuring municipal buildings, emergency facilities (e.g. infrastructure, schools, and hospitals) and other public buildings in the municipal jurisdictions
3. Providing priority in accessing into credits of Risk Mitigation Fund that could be offered for production of urban risk maps and sharing them on urban and national information database"

ii. "Owners of the excluded properties within the jurisdictions of Municipalities that have participated into the ZDS Grant Program can be encouraged to take risk mitigation measures, if these municipalities have higher rates in ZDS Grant Program because of (a) high penetration ratio and (b) urban information database and (c) urban hazard and risk maps, (d) urban risk mitigation plans and (e) 'urban regeneration local action plans'. The ZDS system can offer incentives to homeowners as:

1. Linking ZDS contracts, i.e. deductible and co-insurance mechanisms, into risk mitigation credits of State and Banks
2. Providing priority to homeowners in accessing to the State-Bank credits for risk mitigation
    a. According to risk level (priority to high risk properties)
    b. According to income level of homeowners"

iii. "To encourage the individual efforts of homeowners, the ZDS system can encourage municipalities in the ZDS Grant Program to inspect and certify the retrofitted buildings, according to the standards of urban risk maps, if these municipalities have higher rates in ZDS Grant Program because of (a) high penetration ratio and (b) urban information database and (c) urban hazard and risk maps, (d) urban risk mitigation plans and (e) 'urban regeneration local action plans'.

1. These Municipalities are to be offered incentives such as:
    a. Offering credits from TCIP to the Municipalities
    b. Insuring municipal buildings, emergency facilities (e.g. infrastructure, schools, and hospitals) and other public buildings in the municipal jurisdictions
    c. Providing priority in accessing into credits that could be offered for implementation of local action plans by the Risk Mitigation Fund

2. The Municipalities that inspect and certify the buildings are to share this information with the 'national information database' and to be monitored by the GD-TRU of MPWS".

8) The Article 11, which defines the way to determine the eligible homeowners and their monitoring, can include two more sentences in provision (1) as:
   a. "Local administrations that participate into the ZDS Grant Program are to be supported in "improving their property tax registries in cooperation with Title Deeds Offices" and in "establishing urban information database to share this information with the ZDS system".
   b. "Local administrations that have higher penetration ratio in their jurisdictions are to be given higher rates in the ZDS Grant Program, which means priority to be offered with incentives for their efforts in improving their property tax registries, and establishing urban information database and sharing this database with the ZDS system."
   c. "The incentives of the ZDS Grant Program to be offered for local administrations can differ as:
      i. Offering Credits from TCIP to the Municipalities
      ii. Insuring the main Municipal Building
      iii. Providing priority in accessing into the State and Bank credits for the establishment of information database"

9) The Article 13, which defines the way to determine and implement the ZDS Tariff can be changed as:
   (1) "The ZDS Tariff is to be determined according to the 'standards' of 'urban hazard and risk maps' determined by the GD-TRU of MPWS and the Treasury. The ZDS Tariff is to be implemented according to the 'urban hazard and risk maps' that are produced and shared by the local administrations.
   (2) Municipalities are to be encouraged to produce (1) the production of 'urban hazard and risk maps' and for (2) 'sharing the urban hazard and risk maps' on the 'urban information database' if they have high rates in ZDS Grant Program because of (a) high penetration ratio and b) establishing urban information database.
   a. The incentives to encourage local administrations can include:
      i. Offering Credits from TCIP to the Municipalities
      ii. Insuring the 'municipal buildings'
      iii. Providing priority in accessing into credits of 'Risk Mitigation Fund' that could be offered for the production of urban risk maps and sharing them on urban and national information database directed by the GD-TRU of MPWS."

b. The appropriateness of the produced urban hazard and risk maps according to the standards that are determined by the 'GD-TRU of MPWS', is to be monitored in terms of national information database and other ways that can be determined by the 'GD-TRU of MPWS'

(3) "If the Municipalities do not participate into the ZDS Grant Program; and do not produce and share 'urban hazard and risk maps', the buildings within the jurisdictions of these municipalities can be offered more expensive ZDS premiums, which is to be determined by the ZDS Grant Program and GD-TRU of MPWS."

(4) "If the Municipalities participate into the ZDS Grant Program, and produce and share the 'urban hazard and risk maps' with the ZDS system and the GD-TRU of MPWS in terms of urban information database, the expensive ZDS Tariff in high risk areas can be reduced changed according to mitigated risks. These municipalities in the ZDS Grant Program and homeowners within the jurisdictions of these municipalities could be encouraged for risk mitigation by the ZDS system. if the municipalities have higher rates in ZDS Grant Program according to (a) high penetration ratio and (b) urban information database and (c) urban hazard and risk maps."

a. "The ZDS system can encourage these municipalities to produce and implement 'urban risk mitigation plans' and 'local action plans', and to 'share this information on the urban information database (in Article 11) with the ZDS system.

   i. These municipalities are to be offered incentives as:

      1. Offering Credits from TCIP to the Municipalities

      2. Providing priority in accessing into credits of Risk Mitigation Fund that is offered for the production of urban risk mitigation plans and local action plans; and sharing these risk mitigation activities with the national information database that is directed by the GD-TRU of MPWS.

      3. Insuring municipal buildings, emergency facilities (e.g. infrastructure, schools, hospitals) and other public buildings by the ZDS system

      4. Providing deductibles in ZDS contracts of the municipal buildings emergency facilities (e.g. infrastructure, schools, and hospitals) and other public buildings within the jurisdictions of municipalities, in the case of retrofitting.

   ii. These municipalities that produced and implemented urban risk mitigation plans and local action plans have to be monitored by the 'GD-TRU of MPWS' in terms of national information database and other ways that can be determined by the 'GD-TRU of MPWS'"

b. "Owners of the high risk properties within the jurisdictions of Municipalities that have participated into the ZDS Grant Program can be encouraged to take risk mitigation measures, if these municipalities have higher rates in ZDS Grant Program because of (a) high

penetration ratio and (b) urban information database and (c) urban hazard and risk maps, (d) urban risk mitigation plans and (e) 'urban regeneration local action plans'. The ZDS system can offer incentives to homeowners as:

i. Linking ZDS contracts, i.e. deductible and co-insurance mechanisms, into risk mitigation credits of Banks and Risk Mitigation Fund
ii. Providing priority to homeowners in accessing to the risk mitigation credits of Banks and Risk Mitigation Fund, according to:
    1. Risk level of the properties
    2. Income level of homeowners
    3. Regular purchase of ZDS contracts"

c. "To encourage the individual efforts of homeowners, the ZDS system can promote the municipalities in the ZDS Grant Program to inspect and certify the retrofitted buildings, according to the standards of urban risk maps, if these municipalities have higher rates in ZDS Grant Program because of (a) high penetration ratio and (b) urban information database and (c) urban hazard and risk maps, (d) urban risk mitigation plans and (e) 'urban regeneration local action plans'. The incentives to be offered to municipalities could be as described in the 'Article 13- d- i'. The Municipalities that inspect and certify the buildings that are retrofitted by the homeowners' individual efforts have to share this information with the 'national information database' and have to be monitored by the GD-TRU of MPWS."

7.2.2.2. Proposals for Other Legal Changes

Other legal changes could firstly be about the enhacement of the authorities of the General Directorate of Technical Research and Implementation Unit (GD-TRU) of MPWS for the tasks of:

- Management of the Risk Mitigation Fund,
- Establishment of national information database,
- Determination of the 'safety and risk standards' for 'urban hazard and risk maps',
- Determination of 'regulation standards' to enable the production and implementation of urban risk mitigation plans and urban regeneration local action plans,
- Establishment of risk mitigation project pools and establishment of evaluation commisions,
- Determination of the ZDS Tariff with the Treasury,
- Monitoring the activities local administrations for Production of urban risk maps, Production and implementation of urban risk mitigation plans and urban regeneration local action plans, and Inspection and certification of buildings.

The proposed changes involved in the ZDS (Draft) Law and the establishment of 'National Risk Mitigation Commision' (NRMC) and enhancement of the authorities of of GD-TRU of MPWS could change the related Laws such as:

(1) The Development Law (No. 3194; in 1985)

Particularly the Article 9,which gives the authority of preparing the pre-disaster natural disaster plans to the GD-TRU of MPWS could be enhanced. Accordingly, the technical capacity and authorities of the GD-TRU could be expanded to determine the standards of the 'urban hazard and risk maps' and 'urban risk mitigation plans' (Article 5) and to prepare and to make prepared these maps and plans (Article 9). In addition, the authorities of GD-TRU for the determination of standards of and implementation of urban hazard and risk maps and urban risk mitigation plans in un-authorized housing areas, i.e. un-planned areas, could also be expanded by the Article 7. Moreover, the authority to organize the inspection of buildings could be expanded with organization of the Article 21, 33, 38 and 44 in the Development Law according to the standards of 'urban hazard and risk maps' and 'urban risk mitigation plans'; and linked to the Building Inspection Law (No. 4708). In addition, the authorities of the GD-TRU of MPWS could be expanded to constitute 'risk mitigation project pools', 'evaluation commissions' and 'mechanisms to monitor the activities of the local administrations'; and to manage the Risk Mitigation Fund. For the determination of the ZDS Tariff and the conditions of the ZDS Grant Program in collaboration with the risk mitigation plans and activities at the national level could be determined with the given tasks by the ZDS (Draft) Law and the Development Law. Moreover, the Development Law could be enhanced with regulations that enforce local administrations to prepare microzonation maps, urban hazard and risk maps and urban risk mitigation plans. The Development Law could also include the incentives that could be offered by the ZDS Grant Program and Risk Mitigation Fund. Next, regulation on the Construction of the Buildings in Disaster Regions that is dependent on the Disasters Law (No. 7269) could be linked into the Development Law (No. 3194, in 1985).

(2) The Law about the Authorities of DEMD (No. 5902; in 2009)

The establishment of NRMC could take place in this Law. NRMC could work in collaboration with Earthquake Council (Article 5). The authorities of the Planning and Mitigation Department (PMD) and Earthquake Department (ED) could be determined in detail about their collaboration with GD-TRU of MPWS and the ZDS system. These tasks could include their possible technical contribution to the determination of the standards of urban risk maps and mitigation plans, establishment of urban and national information database, the ZDS Tariff and the ZDS Grant Program.

(3) The Flat Ownership Law (No. 634; in 1965)

To insure the whole building with the ZDS, the apartment managers could be enforced and authorized to purchase ZDS for the common places of the buildings. In addition, the apartment managers could be enforced and authorized to purchase ZDS on behalf of homeowners who did not purchase ZDS and to collect the ZDS premiums from the homeowners. These changes could be reflected into the Articles 18, 20, 21, 35, 47, 48, and 53 of the Flat Ownership Law. In addition, the conditions to retrofitt the individual buildings could be determined in terms of the 'urban risk mitigation plans' of the local administrations, which could give decisions based on the urban hazard and risk maps instead of risks of buildings. If the buildings are decided to take individual risk mitigation measures according to urban risk mitigation plans and local action plans, the homeowners in these buildings could be offered incentives of the ZDS system, in the case of their municipalities participated into the ZDS Grant Program. If the risks of the buildings are decided to be reduced in terms of local action plans of municipalities, the risks of these houses in the buildings could be reduced in terms of determined risk mitigation types by municipalities.

4) The Building Inspection Law (No. 4708; in 2001)

When the buildings could be inspected by the building inspection firms, the 'safety variables' for inspection of the urban risk mitigation could be determined according to 'urban risk maps'. Local administrations could monitor and audit the inspection activities of the firms, and offer certificates to these buildings. The risk mitigation activities of the local administrations could also be monitored by the building inspection firms. However, both the building inspection firms and local administrations could be monitored in terms of rules that will be determined by the 'GD-TRU of MPWS'.

(5) The Metropolitan Municipal Governments Law (No. 5216; in 2004)

Instead of preparing 'natural disaster plans', the metropolitan municipal governments could be authorized to prepare 'urban hazard and risk maps' coherent with the Development Plans in Article 7 of the Metropolitan Municipal Governments Law (No. 5216), in addition to the changes in the Development Law (No. 3194). Moreover, another provision into Article 7 could be added involved with the participation of Metropolitan Municipalities into the ZDS Grant Program and their encouragement with this Program for production of urban hazard and risk maps and urban risk mitigation plans. Another povision could be added for the support of Metropolitan Municipals by the Risk Mitigation Fund in terms of the evaluation of their projects and plans by the Evalution Commisions of the GD-TRU of MPWS. With the changes will be made in the Development Law, the regulations that could enhance the land-use tools in the second provision of the Article 7 (which was about the allocating the places of production and storage of hazardous materials). In addition, the third provision in Article 7,

which was about controlling the measures taken for the fire and other disasters in private and public bulidings, could be expanded with the changes in the Building Inspection Law (No. 4708) in terms of the new law of GD-TRU of MPWS.

(6) The Municipalities Law (No. 5393; in 2005)

The authorization of the local municipalities to develop and implement urban regeneration plans for risk mitigation in Article 73 could be changed in terms of the new Law of ZDS Draft Law and GD-TRU of MPWS. This change could be involved with the conditions and incentives provided by the ZDS Grant Program and GD-TRU of MPWS in accessing risk mitigation credits of Risk Mitigation Fund.

(7) The Law of the Housing Development Administration in Turkey (No. 1985; in 1984): The changes made with the Laws (No 4767 in 2002; and Regulation of the Law No. 4123) were about providing post-disaster credits by TOKI. With the new Law, TOKI be prevented to provide post-disaster credits in urban areas. In addition, TOKI could be authorized to collaborate with local administrations by offering Treasury Land in lower prices and/or construct buildings in safer areas for the higher risk areas that can be determined with the Evaluation Commisions of the GD-TRU of MPWS according to the national information database and the projects in the national project pool.

7.3. RECOMMENDATIONS FOR FURTHER STUDIES

Findings of this study indicate that achieving the efficiency and equity of the ZDS system seem to be the cooperation of the ZDS system with local administrations. Further studies, therefore, can search out how to establish an 'information database' between the ZDS system and local administrations across the country and therefore a 'ZDS Grant Program' to enhance financial and technical capacities of local administrations. For this reason, further studies should find out:

- How to use available technologies, such as Geographical Information Systems and Satellite Mapping, in providing and sharing the information
- Integrating the database with information on penetration ratio via 'property tax records with ZDS contracts and socio-economic situation of homeowners'
- Integrating the database with 'integrated urban risk maps and mitigation activites'
    - Require a pre-study for the 'standardization of integrated urban risk maps in terms of integrating urban safety elements into urban development plans'
- 'How to use urban risk maps and mitigation activities to determine the ZDS Tariff with contractual methods', i.e. deductible and coinsurance mechanism
- 'The ways to link ZDS Tariffs to risk mitigation credits that can be offered by Banks and the State'
- How to support local administrations with ' ZDS grant program' can be another further study that require the standardization of 'efforts of local administrations' in increasing penetration ratio, production of urban risk maps and implemented risk mitigation programs.

Searching out these subjects in high risk areas in terms of pilot projects can contribute to implementation of findings in ZDS system and local administrations in terms of directing research funds without wasting. Therefore, developing and implementing 'community-based risk mitigation projects' in terms of selecting high risk areas as pilot projects seem to be urgent issue to provide assessing these necessities.

REFERENCES

Afyon Haber, http://www.afyonhaber.com/index.php?sayfa_id=1&haber_id=4922&h_k_id=2. Last visited on 14.07.2009.

Andersen, T. J. (2005). Applications of Risk Financing Techniques to Manage Economic Exposures to Natural Hazards. *Sustainable Development Department*, Technical Papers Series, Inter-American Development Bank, Washington, D.C.

Arlikatti, S.S. (2006) "Modelling Household Adoption of Earthquake Hazard Adjustments: A Longitudinal Panel Study of Southern California and Western Washington Residents". *A Dissertation submitted for the degree of Doctor of Philosophy in Urban and Regional Science*, Texas A & M University

Asgary, A. (2003), "Prospect Theory and Its Applications in Disaster and Emergency Management", *Prepared for 3rd International Symposium on Integrated Disaster Risk Management (IDRM-2003)*, Kyoto, JAPAN, 3-5 July.

Athearn, J.L. (1969). *Risk and Insurance.* USA: Meredith Corporation.

Balamir, M. (2008). "Risk Yönetimi ve Yerel Yönetimler, Dünya Bankası Uzaktan Öğrenim Enstitüsü". *Doğal Afet Risk Yönetimi Programı - Güvenli Şehirler Kursu*, Kurs Öğrenim Materyali.

Balamir, M. (2005). 'Local Administration and Risk Management', in K. Demeter, N. E. Erkan, A. Güner (eds.), *The Role of Local Governments in reducing the Risk of Disasters*. The World Bank and Marmara University, 15-34.

Balamir, M. (2004a)."The Current Developments and the Expectations in the Earthquake Issues" (Deprem Konusunda Güncel Gelişmeler ve Beklentiler). *Planning Journal*. 27, 15-23.

Balamir, M. (2004b). “Restructuring Urban Society for Mitigation: Risk Sectors in The Earthquake Master Plan of Metropolitan Istanbul, *Disasters and Society –From Hazard Assessment to Risk Reduction*, Germany, 26-27 July.

Balamir, M. (2002). “Painful Steps of Progress from Crisis Planning to Contingency Planning: Changes for Disaster Preparedness in Turkey”. *Journal of Contingencies and Crisis Manage*ment, Vol. 10, pp. 39-49.

Balamir, M. (2001a). “Recent Changes in Turkish Disasters Policy: A New Strategical Reorientation?” in P.R. Kleindorfer *(ed.) Mitigating and Financing Seismic Risks in Turkey*,. NATO Science Series, Kluwer Academic Publishers, 207-234.

Balamir, M. (2001b) “Disaster Policies and Social Organisation”. Paper presented at the 5th Conference of ESA, Helsinki. ‘*Disaster and Social Crisis Research Network’ sessions: ‘Deconstructing Disaster Management: Beyond the Command and Control Model’*, Chaired by Maureen Fordham.

Balamir et al. (2004) “Zeytinburnu Urban Regeneration Action Plan (Zeytinburnu Dönüşüm Eylem Planı)”, *Department of City and Regional Planning*, METU.

Beck, U. (1999). *World Risk Society.* Cambridge: Polity Press.

Beck, U. (1996). “Risk Society and the Provident State”. In S. Lash, B, Szerszynski, B, Wynne, B. (Eds.), *Risk, Environment and Modernity: Towards a New Ecology*. London; Thousand Oaks, California: Sage Publications.

Beck, U. (1992a). “From Industrial Society to the Risk Society: Questions of Survival, Social Structure and Ecological Enlightenment”. *Theory, Culture and Society,* 9, 97-123.

Beck, U. (1992b). *Risk Society. Towards A New Modernity*, (M. Ritter, Trans.). London; Newbury Park, California: Sage Publications.

Beck, U. and Lau, C. (2005) “Second modernity as a research agenda: theoretical and empirical explorations in the ‘meta-change’ of modern society”. *The British Journal of Sociology, Vol 56 (4).*

Beck, U.; Giddens, A. and Lash, S. (1994) *Reflexive Modernization. Politics, Tradition and Aesthetics in the Modern Social Order*. Stanford University Press.

Berke, Philip (2002). "Does sustainable development offer a new direction for planning? Challenges for the twenty-first century". *Journal of Planning Literature*, 17 (1): 21-36.

Bibbee, A., Gonenc, R., Jacobs, S., Konvitz, J. and Price, R. (2000). "Economic Effects Of The 1999 Turkish Earthquakes: An Interim Report", *Organization For Economic Co-Operation And Development- Economics Department*, ECO/WKP: OECD 20.

Bickelhaupt, D.L. and Magee, J.H. (1970) *General Insurance*, Richard D. Irwin, Inc, Home woof, Illinois

Blaikie, P. M., Davis, I., Wisner, B. (1994/2004). *At Risk: Natural Hazards, People's Vulnerability, and Disasters. (*1st and 2nd ed.). London ; New York: Routledge.

Bolin, R. and Stanford, L. (1998). *The Northridge Earthquake, Vulnerability and Disaster.* London and New York: Routledge.

Bourque, L. B., Shoaf, K. I., Nguyen, L. H. (1997). "Survey research". *International Journal of Mass Emergencies and Disasters*, *15*, 71-101.

Burby, R.J.; Deyle, R.E.; Godschalk, D.R. and Olschansky, R.B. (2000) "Creating Hazard Resilient Communities Through Land-Use Planning". *Natural Hazards Review*, 99.

Burby, R.J. (1999) "Unleashing the Power of Planning to Create Disaster-Resistant Communities". *Journal of the American Planning Association*, Vol. 65 (3): 247.

Burby, R. J.; Dalton, L. C. (1994). "Mandates, plans, and planners." *Journal of the American Planning Association*, Vol. 60 Issue 4, pp.444, 18p (73)

Burby, R.J., French, S.P. Nelson, A.C. (1998). "Plans, code enforcement, and damage reduction: Evidence from the Northridge earthquake". *Earthquake Spectra, 14,* 59-74.

Burton, I., Kates, R. and White, G. (1978/1993). *The Environment as Hazard, (*1st and 2nd ed.). New York: Guilford.

Campbell, S. (1996). "Green Cities, Growing Cities, Just Cities? Urban Planning and the Contradictions of Sustainable Development", *Journal of the American Planning Association*, Vol. 62, No.3.

CCS (2008). *Natural Catastrophes Insuance Cover. A Diversity of Systems*. Consorcio De Compensacion De Seguros, Madrid.

CEA (2008) California Earthquake Authority. http://www.earthquakeauthority.com/, Last visited on 10.09.2009.

Cumhuriyet Gazetesi, 20.04.2008

Çiçek, H. (2005). "Process and Participation in Legal Regulations of Urban Regeneration: The Case of Zeytinburnu, Istanbul". A Thesis Submitted to the Graduate School Of Natural and Applied Sciences of Middle East Technical University, Department of City and Regional Planning.

Dake, K. (1991). "Orientating dispositions in the perceptions of risk: an analysis of contemporary worldviews and cultural biases", *Journal of Cross-Cultural Psychology* 22: 61-82

DASK (2008) *Activity Report of the ZDS Sy*stem, www.dask.gov.tr/data/dask2008en.pdf, Last visited on 20.10.2009.

DASK (2009) Doğal Afet Sigortaları Kurumu, www.dask.gov.tr, Last visited on 20.10.2009.

DASK (2003). Natural Disaster Insurance Institution Database (Doğal Afet Sigortalar Kurumu). Obtained with Special Permissions of Milli-Re (The Operational Manager) and the Board of Directors of DASK

De Man, A.; and Simpson-Housley, P. (1987). "Factors in perception of earthquake hazard". *Perceptual and Motor Skills*, *64*, 815-820.

DMA (2000) Disaster Mitigation Act. Federal Emergency Management, USA.

http://hazardmitigation.calema.ca.gov/docs/Blue_Book_Update_Introduction_Release_11-02-06_2.pdf, Last visited on 20.10.2009.

Dooley, D., Catalano, R., Mishra, S., and Serxner, S. (1992). "Earthquake preparedness: Predictors in a community survey". *Journal of Applied Social Psychology*, *22*, 451-470.

Douglas, M. and Wildavsky, A. (1982). *Risk and Culture: An Essay on the Selection of Technical and Environmental Dangers.* Berkeley: University of California Press.

Edwards, M. L. (1993). "Social location and self-protective behavior: Implications for earthquake preparedness". *International Journal of Mass Emergencies and Disasters*, *11*, 293-304.

El-Masri, S.and Tipple, G. (2002). "Natural Disaster, Mitigation and Sustainability: The Case of *Developing Countries". International Planning Studies*, 7:2, 157-175.

EMPI (2003). *Earthquake Master Plan of Istanbul*, Istanbul Metropolitan Municipality, Turkey. http://www.ibb.gov.tr/tr-TR/SubSites/IstanbulVeDeprem/Calismalarimiz/Documents/IBB.IDMP.ENG.pdf, Last visited on 20.10.2009

EQE Briefing (1999). "Izmit, Turkey Earthquake of August 17", 1999 (M7.4). EQECAT. http://www.absconsulting.com/resources/Catastrophe_Reports/Izmit-Turkey-1999.pdf, Last visited on 20.10.2009

Erdik M. (2001). "Report on 1999 Kocaeli and Düzce (Turkey) Earthquakes". In F. Casciati,G. Magonette (eds.), *Structural Control for Civil and Infrastructure Engineering*,World Scientific.

Ericson, R. V. and Doyle, A. (2004). "Catastrophe risk, insurance and terrorism", *Economy and Society,* Vol. 33 No. 2, pp. 135–173.

Ericson, R.V.; Doyle, A.; Barry, D. (2003). *Insurance as Governance.* Toronto; Buffalo: University of Toronto Press.

Ewald, F. (1991) “Insurance and risk”. In Burchell, G.; Gordon, C and Miller, P. (eds) The Foucault Effect. Studies in Governmentality. With two lectures by and an interview with Michel Foucault, Harvester Wheatsheaf.

Evren, B. (2003) *Surların Öte Yanı Zeytinburnu*, Zeytinburnu Municipality.

Farley, J. E., Barlow, H. D., Finkelstein, M. S., and Riley, L. (1993). “Earthquake hysteria, before and after:Asurvey and follow-up on public response to the Browning forecast”. *International Journal of Mass Emergencies and Disasters*, *11*, 305-322.

Faure, M. G. (2006). “Economic Criteria for Compulsory Insurance”. *The Geneva Papers*, 31, (149–168)

FEMA (2008) Hawaii Hurricane Relief Project, Federal Emergency Management Agency, USA, https://www.fema.com/mitigationbp/bestPracticeDetailPDF.do;jsessionid=2EB2C15F26401927E0845EEEB659D95B.Worker2Public?mitssId=211, Last visited on 20.10.2009.

FOPI- Federal Office of Private Insurance http://www.bpv.admin.ch, Last visited on 21.10.2009.

Frame, D. E. (2001). “Insurance and Community Welfare”. *Journal of Urban Economics*, 49, 267–284.

Freeman, P.K.; Scott, K.; Westerberg, L.; Dais, J. (2004). “Disaster Financing in OECD and Emerging Countries”. *Fifth Conference on Insurance Regulation and Supervision in Latin America*, May 26-27.

Freeman, P.K.; Martin, L.A.; Linnerooth-Bayer, J.; Mechler, R.; Pflug, G.; Warner, K. (2003). “Disaster Risk Management: National Systems for the Comprehensive Management of Disaster Risk and Financial Strategies for Natural Disaster Reconstruction”. *Sustainable Development Department, Environment Division, Integration and Regional Programs Department, Regional Policy Dialogue*, Inter-American Development Bank: Washington, D.C.

Freeman, P. K. (2000). “Infrastructure, Natural Disasters, and Poverty”. In A. Kreimer and M. Arnold. (Eds.) *Managing Disaster Risk in Emerging Economies.* Washington DC, World Bank.

Friedman, M. and Savage, L.P. (1948). “The Utility Analysis of Choices Involving Risk”. *Journal of Political Economy*, 56, 279-304.

Ganz, S. (1998). "Public Policy Options and Earthquake Insurance". Paper represented in *Western Eartuake Insurance Summit presented by Western States Seismic Policy Council*, www.wsspc.org/summit/eqiperspectives1.html, Last visited on 20.11.2009.

GD-DA (2009) General Directorate of Disaster Affairs, Ministry of Public Works and Settlements, http://www.deprem.gov.tr/, Last visited on 21.10.2009.

GD-MRE (2009) General Directorate of Mineral Research and Exploration, Ministry of Public Works and Settlements of Turkish Republic, Turkey. Available at: http://www.ibb.gov.tr/tr-TR/SubSites/IstanbulVeDeprem/PublishingImages/haritaturkiye.jpg Last visited on 12.07.2009.

Giddens, A. (1998). "Risk Society: the Context of British Politics", in J. Franklin (ed.), *Politics of Risk Society.* UK: Polity Press.

Giddings, B.; Hopwood, B. and O'Brien, G. (2002). "Environment, Economy and Society: Fitting Them Together into Sustainable Development". *Sustainable Development,* 10, 187–196.

Gilbert, R. and A. Kreimer (1999). *Learning from the World Bank's Experience of Natural Disaster Related Assistance*. Washington D.C.: World Bank.

Godschalk, D.R.; Kaiser, E.J. and Berke, P. (1998). "Integrating Hazard Mitigation and Local Land Use Planning". In Burby, R.J. (ed.) *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities,* Joseph Henry Press: Washington D.C.

Gulkan, P. (2001). "Rebuilding the Sea of Marmara Region: Recent Structural Revisions in Turkey to Mitigate Disasters," A Wharton-World Bank Conference on *Challenges in Managing Catastrophic Risks: Lesson for the US and Emerging Economies*, Washington, D.C.

Gurenko, E.; Lester, R.; Mahul, O.; and Gönülal S.O. (2006). "Earthquake insurance in Turkey: history of the Turkish Catastrophe Insurance Pool", *The International Bank for Reconstruction and Development*, Washington DC.

Gurenko, E. N. (2004). “Building Effective Catastrophe Insurance Programmes at the Country Level: A Risk Management Perspective”. In E.N Gurenko (ed.), *Catastrophe Risk and Reinsurance: A Country Risk Management Perspective.* London: Incisive Financial Publishing.

Gurenko, E. N. and Lester, R. (2004). “Rapid Onset Natural Disasters: The Role of Financing in Effective Risk Management”, *Insurance and Contractual Savings Practice, Financial Sector Operations and Policy Department*, World Bank Policy Research Working Paper 3278.

Gurenko, M. (2003). “National Catasrophe Risk Management Programs: International Experience, Natural Disasters - Fiscal and Financial Risk Management”, *World Bank Insurance Practice*, India, New Delhi.

Guy Carpenter (2007). “The World Catastrophe Reinsurance Market. New Capital Stabilizes Market”. *Guy Carpenter*, *www.guycarp.com* Last visited on 12.07.2009.

Hinshaw, R.E. (2006). *Living with nature's extremes: the life of Gilbert Fowler White*. Boulder, CO: Johnson Books.

Holzmann, R. (2001) “Risk and Vulnerability: The Forward Looking Social Protection in a Globalizing World”, Plenary Session: Risks and Vulnerabilities – The Role of Social Protection in Poverty Reduction Efforts in Asia and the Pacific under the Asia and Pacific Forum on Poverty: Reforming Policies and Institutions for Poverty Reduction, to be held at the Asian Development Bank, Manila. http://www.world-psi.org/psi.nsf/Publications/CCB1C6AF3F5AFB5DC12569EB00549A95?OpenDocument, Last visited on 20.09.2009

Holzman, R. and S. Jorgensen (2000). “Social Risk Management: A Conceptual Framework for Social Protection and Beyond”. *Social Protection Discussion Paper Series*, 0006. Washington, DC. World Bank.

Hoy, M. (1984). “The impact of imperfectly categorizing risks on income inequality and social welfare”. *Canadian Journal of Economics*. 17 (3), 557- 568.

Hoy, M. (1982). “Categorizing Risks in the Insurance Industry”, *Quarterly Journal of Economics* 1982, 97(2), 321-336.

Hyogo Framework for Action 2005-2015, *United Nations International Strategy for Disaster Reduction*, http://www.unisdr.org/eng/hfa/docs/HFA-brochure-English.pdf, Last visited on 18.09.2009.

IDB (2000). "Facing the Challenge of Natural Disasters in Latin America and the Caribbean". *An IDB Action Plan*. Inter-American Development Bank. Washington DC.

IDB (2003). "The Notion of Disaster Risk – Conceptual Framework for Integrated Management", *Information and Indicators Program for Disaster Risk Management*, Instituto de Estudius Ambientales IDEA- UN, Manizales- Colombia.

IMM-GIS Database (2003). Istanbul Metropolitan Municipality, Geographical Information System Database.

Incheon Declaration (2009) Incheon Declaration: Building a local governance alliance for DRR - conference summary, United Nations International Strategy for Disaster Reduction Secretariat, http://www.preventionweb.net/files/10962_IncheonDeclarationFinal28Aug09.pdf, Last visited on 18.09.2009.

Ingram, D. (2009) "Group (Risk) Therapy An Introduction to Cultural Theory". Keynote speech presented at the *2009 Enterprise Risk Management Symposium*, Chicago. http://www.soa.org/files/pdf/2009-chicago-erm-ingram-02.pdf, Last visited on 10.07.2009.

ISDR (2008/2009). EM-DAT: The OFDA/CRED International Disaster Database, http://www.em-dat.net, UCL - Brussels, Belgium: in International Strategy for Disaster Reduction, http://www.unisdr.org/disaster-statistics/impact-affected.htm, Last visited on 07.05.2009.

Jackson, E. L. (1981). "Response to earthquake hazard: The West Coast of North America". *Environment and Behavior*, *13*, 387-416.

Jackson, E. L. (1977). "Public response to earthquake hazard". *California Geology*, *30*, 278-280.

Jackson, E. L. and Mukerjee,T. (1974). "Human adjustment to the earthquake hazard of San Francisco, California". In G. F. White (Ed.), *Natural hazards: Local, national and global* (pp. 160-166). New York: Oxford University Press.

Kahneman, D.; Slovic, P. and Tversky A. (1982.) *Judgement under uncertainty: Heuristics and biases*. New York: Cambridge University Press.

Kahneman, D. and Tversky, A. (1979) "Prospect Theory: An Analysis of Decision under Risk", *Econometrica*, Vol. 47, No. 2, pp. 263-292.

Karacan, A. İ. (1994). *Sigortacılık ve Sigorta Şirketleri*. İstanbul: Bağlam Yayınları.

Keleş R. (2004). "Turkish Government Structure from a Disaster Management Perspective". In Demeter K., Guner A., Erkan N. E., (eds.) *The Role of Local Governments in Reducing the Risk of Disasters*, Center of Local Government Studies and Training, Marmara University, Istanbul.

Kıral, Ö. (2004). "The Evaluation, Suggestions and Counterviews for the Earthquake Insurance Commission Report in the Earthquake Assembly- 2004", *Planning* 2, 62-67. ("Deprem Şurası-2004-Kaynak Temini ve Sigorta Komisyonu Çalışmalarına İlişkin Değerlendirme, Öneriler ve Karşı Görüşler, Planlama")

Kiecolt, K. J., and Nigg, J. M. (1982). "Mobility and perceptions of a hazardous environment". *Environment and Behavior*, *14*, 131-154.

Kleindorfer, P. R. and Kunreuther, H. (1999). "The Complementary Roles of Mitigation and Insurance in Managing Catastrophic Risks". *Risk Analysis, Vol. 19 (4).*

Kohler, H. (1982). *Intermediate Microeconomics: Theory and Applications*. Glenview, Ill. : Scott, Foresman.

Kreimer, A. and Arnold, M. (2000). "World Bank's role in reducing impacts of disasters". *Natural Hazards Review,* 1(1): 37-42.

Kreimer, A.; Arnold, M; Barham, C.; Freeman, P.; Gilbert, R.; Krimgold, F.; Lester, R.; Pollner, J.D.; Vogt, T. (1999). *Managing Disaster Risk in Mexico: Market Incentives for Mitigation Investment.* Washington D.C.: The World Bank.

Kunreuther, H. (2006). “Disaster Mitigation and Insurance: Learning from Katrina”. *The ANNALS of the American Academy of Political and Social Science,* 604; p: 208-227.

Kunreuther; H.; Deodatis, G. and Smyth, A. (2004). “Integrating Mitigation with Risk Transfer Instruments.” In E.N. Gurenko (ed.), *Catastrophe Risk and Reinsurance: A Country Risk Management Perspective*, London: Incisive Financial Publishing.

Kunreuther, H. (2001). “Incentives for Mitigation Investment and More Effective Risk Management-The Need for Public-Private Partnerships”, a revised version of a paper presented at The World Bank Conference on “*Issues for a Consultative Group for Global Disaster Reduction*” in Paris, June 1 and 2, 1999. Center for Risk Management and Decision Processes, The Wharton School, University of Pennsylvania.

Kunreuther, H.; Grossi, P.; Seeber, N. and Smyth, A. (2001). “A Framework for Evaluating the Cost-Effectiveness of Mitigation Measures”, Paper presented in the *Boğaziçi University/Columbia University Workshop, Urban Risk Management for Natural Disasters*, Bogazici University, Istanbul, Turkey.

Kunreuther, H. (2000). “Insurance As Cornerstone For Public-Private Sector Partnerships”. *Natural Hazards Review*, Vol 1(2).

Kunreuther, H. (1998). “Insurance as an Integrating Policy Tool for Disaster Management: The Role of Public-Private Partnerships”, paper represented in *Western Earthquake Insurance Summit presented by Western States Seismic Policy Council*, www.wsspc.org/summit/eqiperspectives1.html, Last visited on 21.10..2009

Kunreuther, H. & Roth, R. Sr. ed. (1998). *Paying the price: The status and role of insurance against natural disasters in the United States*. Washington, D.C: Joseph Henry Press

Kunreuther, H. and Slovic, P. (1978). “Economics, Psychology and Protective Behavior”. *Psychology and Economics*, 68 (2).

Kunreuther, H., Ginsberg, R., Miller, L., Sagi, P., Slovic, P., Borkan, B., and Katz, N. (1978). *Disaster insurance protection: Public policy lessons*. New York: John Wiley.

Lazarus, R.S., and Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.

Li, W. (1998). “Hazard Insurance and Mitigation Measures For Natural Hazards”, paper represented in *Western Earthquake Insurance Summit presented by Western States Seismic Policy Council*, www.wsspc.org/summit/eqiperspectives1.html, Last visited on 21.10..2009

Lindell, M. K. and Prater, C.S. (2000). “Household adoption of seismic hazard adjustments: A comparison of residents in two states”. *International Journal of Mass Emergencies and Disasters, 18,* 317-38.

Lindell, M.K. and Perry, R.W. (2000). “Household Adjustment to Earthquake Hazard A Review of Research”. *Environment and Behavior*, 32 (4), p. 461-501.

Lindell, M.K and Whitney, D.J. (2000). “Correlates of Household Seismic Hazard Adjustment Adoption”. *Risk Analysis*, 20 (1).

Lindell, M.K., Alesch, D., Bolton, P.A., Greene, M.R., Larson, L.A., Lopes, R. May, P.J.,Mulilis, J.P., Nathe, S., Nigg, J.M., Palm, R., Pate, P., Perry, R.W., Pine, J., Tubbesing, S.K. and Whitney, D.J. (1997). “Adoption and implementation of hazard adjustments”. *International Journal of Mass Emergencies and Disasters Special Issue, 15,* 327- 453.

Linerooth-Bayer, J., Field, M.J.M., Verheyen, R. and Compton, K. (2003). “Insurance-Related Actions and Risk Assessment in the Context of UNFCCC”. http://unfccc.int/files/meetings/workshops/other_meetings/application/pdf/background.pdf, Last visited on 21.10.2009

Liverman, D. (2001). “Environmental Risk and Hazards”. *International Encyclopedia of the Social & Behavioral Sciences*, 4655-4659.

Lupton, D. (1999a). *Risk*. London: Routledge.

Lupton, D. (1999b). *Risk and Sociocultural Theory. New directions and perspectives*. Cambridge ; New York : Cambridge University Press.

Mahul, O. and Gurenko, E. (2006). “The Macro Financing of Natural Hazards in Developing Countries, Financial Markets for Social Safety Net”, *Financial and Private Sector Department*, The World Bank Policy Research Working Paper 4075.

Marris, C.; Langford, I. H.; O’riordan, T. (1998) “A Quantitative Test of Cultural Theory of Risk Perceptions: Comparison with the Psychometric Paradigm”, *Risk Analaysis*, Vol. 18, No. 5

Mileti, D.S. (1999). *Disaster by design: A reassessment of natural hazards in the United States*. Washington, DC: Joseph Henry Press.

Mileti, D. S., and Darlington, J. D. (1995). “Societal response to revised earthquake probabilities in the San Francisco Bay area”. *International Journal of Mass Emergencies and Disasters*, *13*, 119-145.

Mileti, D. S. and Fitzpatrick, C. (1993). *The great earthquake experiment: Risk communication and public action*. Boulder, CO: Westview.

Mileti, D. S., & O’Brien, P. (1992).”Warnings during disaster: Normalizing communicated risk”. *Social Problems*, *39*, 40-57.

MPWS (2004) *Earthquake Convention Report*, Deprem Şurası, Bayındırlık ve İskan Bakanlığı, Ankara.

Mulilis, J-P., & Duval, T. S. (1995). “Negative threat appeals and earthquake preparedness: A person-relative-to-event PrE model of coping with threat”. *Journal of Applied Social Psychology*, *25*, 1319-1339.

Mulilis, J-P., and Lippa, R. A. (1990). “Behavioral change in earthquake preparedness due to negative threat appeals:Atest of protection motivation theory”. *Journal of Applied Social Psychology*, *20*, 619-638.

Munich Re (2007). *Topics Geo Annual Review: Natural Catastrophes 2006, Analysis, assessments, positions.* Munich, Munich Re Group, http://www.munichre.com/publications/302-05699_en.pdf, Last visited on 21.10.2009

Munich Re (2006). *Topics Geo Annual Review: Natural Catastrophes 2005*. Munich, Munich Re Group, http://www.munichre.com/publications/302-04772_en.pdf, Last visited on 21.10.2009

Munich Re (2000a). *Topics: Jahresrückblick Naturkatastrophen 1999*. Munich, Munich Re Group, http://www.munichre.com/publications/302-06021_de.pdf, Last visited on 21.10.2009

Munich Re (2000b). *Topics 2000, Natural Catastrophes - The Current Position, Special Millenium Issue*, Munich, Munich Re Group.

Nordskog, K. (2006). "Natural Catastrophe Risk Management Policy in Norway". *Doğal Afet Riskleri için Sigorta ve Reasürans, I. Uluslararası Sigorta Sempozyumu*, Türkiye Sigorta ve Reasürans Şirketleri Birliği, Yayın No: 17, İstanbul.

NFIP (2002). National Flood Insurance Program Description. http://www.fema.gov/library, Last visited on 21.09.2009.

OAS (2004). "Managing Natural Hazard Risk: Issues and Challenges", *Organization of American States, Unit for Sustainable Development & Environment*, Policy Series, No: 4., www.oas.org/usde, Last visited on 21.10.2009

OECD (2009) *Draft Policy Handbook on Natural Hazard Awareness and Disaster Risk Reduction Education,* Approved for public consultation by the OECD Insurance and Private Pensions Committee.

O'Malley, P. (2003). "Governable catastrophes: a comment on Bougen". *Economy and Society, 32(2), 275–279.*

Olchansky and Kartez (1998). "Managing Land Use to Build Resilience". In Burby, R.J. (ed.) *Cooperating with Nature - Confronting Natural Hazards with Land-Use Planning for Sustainable Communities.* Joseph Henry Press: Washington D.C.

Oltedal, S.; Moen, B.-E.; Klempe, H. and Rundmo, T. (2004) "Explaining risk perception. An evaluation of cultural theory", (eds) Rundmo, T. Rotunde no. 85, Norwegian University of Science and Technology, Department of Psychology, Trondheim, Norway: Rotunde publikasjoner.

O'Neill, P. (2004) "Developing A Risk Communication Model to Encourage Community Safety from Natural Hazards", *Community Safety Program*, State Emergency Service, State of New South Wales, Document 27. http://www.ses.nsw.gov.au/multiversions/2304/FileName/Developing_a_risk_communication_model.pdf, Last visited on 20.09.2009

Özmen, B., Nurlu, M., Kurterdem, K., Temiz, A. (2005). "Afet Yönetimi ve Afet İşleri Genel Müdürlüğü", *Deprem Sempozyumu*, 23-25 Mart 2005. Kocaeli.

Özmen, B., and Nurlu, M. (1999). "Deprem Bölgeleri Haritası ile İlgili Bazı Bilgiler", *TMMOB Jeoloji Mühendisleri Odası Haber Bülteni*, 99(2-3), 32-35.

Palm, R., and Hodgson, M. (1992a). *After a California earthquake: Attitude and behavior change*. Chicago: University of Chicago Press.

Palm, R. and Hodgsson, M, (1992b) "Earthquake Insurance: Mandated Disclosure and Homeowner Response in California", *Annals of Association of American Geographers*, 82 (2), 207-222.

Palm, R.I. (1990). *Natural Hazards – An Integrative Framework for Research and Planning.* Baltimore and London: John Hopkins University Press.

Palm, R.; Hodgson, M.; Blanchard, R. D.; and Lyons, D. (1990). *Earthquake insurance in California*. Boulder, CO: Westview.

Parsons, T.; Toda, S.; Stein, R.S.; Barka, A.; Dietrich, J.H. (2000). "Heightened Odds of Large Earthquakes Near Istanbul: An Interaction-Based Probability Calculation", *Science* 28 April: Vol. 288. no. 5466, pp. 661 – 665

Peacock, W.G. (2003) "Hurricane Mitigation Status and Factors Influencing Mitigation Status among Florida's Single-Family Homeowners". *Natural Hazards Review*, Vol. 4, No. 3.

Peacock, W., Morrow, B. and Gladwin, H. (eds) (1998). *Hurricane Andrew and Miami: Toward A New Socio-Political Ecology of Disasters.* London: Routledge.

Pelling, Mark (2003). *The Vulnerability of Cities.* UK and USA: Earthscan Publications.

Pollner, J. (2000a). Managing catastrophic risks using alternative risk financing & insurance pooling mechanisms. Washington D.C.: World Bank.

Pollner, J. (2000b), "Catastrophe Risk Management Using Alternative Risk Financing and Insurance Pooling Mechanisms: The Insurance Market and the Case of the Caribbean Region", *World Bank Policy Research Working Paper, No. 2560* , Washington, DC: World Bank.

Priest, G. L. (2003). "Government Insurance versus Market Insurance". *The Geneva Papers on Risk and Insurance*, 28 (1): 71–80

Raschky, P.A. and Weck-Hannemann, H. (2007). "Charity hazard—A real hazard to natural disaster insurance?", *Environmental Hazards,* 7, 321–329.

Ryland, H. G. (2000) "A piece of the Puzzle: Insurance Industry Perspective on Mitigation". *Natural Hazards Review*, Vol. 1, No. 1. February.

Russell, L., Goltz, J. D., and Bourque, L. B. (1995). "Preparedness and hazard mitigation actions before and after two earthquakes". *Environment and Behavior*, *27*, 744-770

Sapir, D.G., Hargitt, D. and Hoyois, P. (2004). *Thirty Years of Natural Disasters 1974-2003: The Numbers*, Centre for Research on te Epidemiology on Disasters, Belgium: Presses Universitaires de Louvain, Louvain la Neuve.

Schwarze, R. and Wagner, G.G. (2007). "The Political Economy of Natural Disaster Insurance: Lessons from the Failure of a Proposed Compulsory Insurance Scheme in Germany", *European Environment,* 17: 403–415.

Schwarze, R. and Wein, T. (2005). "Is the Market Classification of Risk Always Efficient? - Evidence from German Third Party Motor Insurance", *GRIR (German Risk and Insurance Review)*, Vol. 1: 173-202.

Selçuk, S,; Yazıcı, S.; Gülkan, P. (2001). "Compulsory Earthquake Insurance Scheme for Residences in Turkey and its Financial Implications", *Journal of International Insurance*, 2(4).

Showalter, P. S. (1993). “Prognostication of doom: An earthquake prediction’s effect on four small communities”. *International Journal of Mass Emergencies and Disasters*, *11*, 279-292.

Simon, H.A. (1955). “A Behavioral Model of Rational Choice”, *The Quarterly Journal of Economics*, Vol. 69, No. 1, pp. 99-118.

Sjöberg, L.; Moen, B.E. and Rundmo, T. (2004). *Explaining risk perception: An evaluation of the psychometric paradigm in risk perception research*, Rotunde, No. 84, Norway.

Slovic, Paul; Finucane, Melissa; Peters, Ellen and MacGregor, Donald G. (2002) “The Affect Heuristic,” in Thomas Gilovich, Dale Griffin, and Daniel Kahneman (eds.), *Heuristics and Biases*. New York: Cambridge University Press, 2002, pp. 397-420.

Slovic, P. and Weber, E. (2002). “Perception of risk posed by extreme events”. In *Risk management strategies in an uncertain world.* Columbia/Wharton Roundtable, Palisades, NY

Smith, K. (1996/2004). *Environmental Hazards: Assessing Risk and Reducing Disaster*, (1st and 4th ed.), London and New York: Routledge.

Steg, L. And Sievers, I. (2000). “Cultural theory and individual perceptions of environmental risks”. *Environment and Behavior, 32*, 250-269.

Stiglitz, J. (2003). “Globalization and the economic role of the state in the new millenium”. *Industrial and Corporate Change*, 12(1):3-26.

Stiglitz, J. E. (1994). “Rethinking the Economic role of the State: Publicly Provided Private Goods”. Replanteamiento del papel económico del estado: bienes privados suministrados públicamente, *Celección els Llibres Dels Fulls Econòmics*, 10, Generalitat de Catalunya Departament de Sanitat I Seguretat Social, pp. 19-47,.

Sullivan, R., Mustart, D. A., and Galehouse, J. S. (1977). “Living in earthquake country”. *California Geology*, *30*, 3-8.

SPO (State Planning Organization of Prime Ministry of Turkey) (2000). Başbakanlık Devlet Planlama Teşkilatı (DPT) – “Uzun Vadeli Strateji ve Sekizinci Beş Yıllık Kalkinma” Planı, Ankara.

SPO (State Planning Organization of Prime Ministry of Turkey) (1999). (Başbakanlık Devlet Planlama Teşkilatı -DPT) "Depremin Ekonomik ve Sosyal Etkileri: Muhtemel Finans İhtiyacı. Kısa-Orta ve Uzun Vadede alınabilecek Tedbirler". Ankara.

Taymaz, M. (2001). "Doğal Afet Zararlarını Azaltma Çalışmaları", *Afet ve Afet İşleri Genel Müdürlüğü*, Sayı 2.

TBMM (2000) "The Report of the Plan and Budget Commision of Turkish Parliament (1/782,1/609) about the Compulsory Earthquake Insurance Decree (No. 587)", *Plan and Budget Commision of Turkish Parliament*, No: 824, Year of Legislation 4, Period: 21.

Thieken, A.H.; Petrow, T.; Kreibich, H. and Merz, B. (2006). "Insurability and Mitigation of Flood Losses in Private Households in Germany", *Risk Analysis, Vol. 26 (2).*

Thompson, M. (2003). "Cultural theory, climate change and clumsiness". *Economic and Political Weekly*, November 29,.

Tierney, K. (2006). "Social Inequality, Hazards and Disasters". In R.J. Daniels, D.F. Kettl and H. Kunreuther (Eds.) *On Risk and Disaster Lessons from Hurricane Katrina,* (pp.109-128), Philadelphia: University of Pennsylvania Press.

Tierney, K.J.; Lindell, M. K. and Perry, R. W. (2001). *Facing the Unexpected - Disaster Preparedness and Response in the United States.* Washington D.C.: Joseph Henry Press.

Tierney, K. J. (1999). "Toward a Critical Sociology of Risk". *Sociological Forum*, 14, 215-242.

Tobin, G. A. and Montz, B. E. (1997). *Natural Hazards - Explanation and Integration.* New York and London: The Guilford Press.

TOKI (2009) Deprem Kredi Uygulamaları, http://www.toki.gov.tr/page.asp?ID=25, Last visited on 21.09.2009.

TUIK (2003) Household Income in Turkey According to Income Groups, www.tuik.gov.tr, Last visited on 21.09.2009.

TUIK (2001) Gross Domestic Product per Capita in Provinces, Doğal Afet Sigortalar Kurumu. www.tuik.gov.tr, Last visited on 21.09.2009.

TUIK (2000). *Building Census*. State Institute of Statistics of Turkey.

TUIK (1966-2000) *Construction Statistics.* State Institute of Statistics of Turkey.

Turner, R. H.; Nigg, J. M.; and Paz, D. (1986). *Waiting for disaster: Earthquake watch in California*. Berkeley: University of California Press.

UDK (2002) *Deprem Zararlarını Azaltma Ulusal Stratejisi*. Ulusal Deprem Konseyi Raporu, Tübitak, Ankara. http://udk.tubitak.gov.tr/rapor/index.html, Last visited on 21.09.2009.

UN/ISDR (2009) United Nations International Strategy For Disaster Reduction Terminology http://www.unisdr.org/eng/library/lib-terminologyeng%20home.htm, Last visited on 21.06.2009.

UN/ IDNDR (1999-2000) "Declaration of 'United Nations International Decade for Disaster Reduction'", *United Nations General Assembly Resolution 236 session 44 on 22 December 1989* (retrieved 2008-09-18), http://www.undemocracy.com/A-RES-44-236.pdf, Last visited on 21.06.2009.

UNDP (2004) "Reducing Disaster Risk: A Challenge for Development", *United Nations Development Program*, http://www.undp.org/cpr/disred/documents/publications/rdr/english/rdr_english.pdf, Last visited on 20.10.2009.

UNDP/ISDR (United Nations Development Programme) (2004). "*A global report reducing disaster risk, a challange for development", Bureau for Crisis Prevention and Recovery*, United Nations, Development Programme. http://www.undp.org/cpr/disred/documents/publications/rdr/english/rdr_english.pdf, Last visited on 21.10.2009.

WCED (1987). *World Commission on Environment and Development Our common future*. Oxford, UK: Oxford University Press. http://www.un-documents.net/wced-ocf.htm, Last visited on 21.10.2009.

Weber, E. U., Blais, A., and Betz, N. E. (2002). “A domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors”. *Journal of Behavioral Decision Making*, 15(4), 263-290.

Weinstein, N.D. (1989) “Optimistic Biases about Personal Risks”, *Science*, Vol. 246, No. 4935 (Dec. 8).

Wilczynski, P.M.; Chhibber, A.; Goldberg, J.R. (1999). “Turkey - Marmara Earthquake Emergency Reconstruction Project”, *The World Bank Project Appraisal Document Report.http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1999/12/03/000094946_9911240530580/Rendered/PDF/multi_page.pdf,* Last visited on 21.10.2009.

Wildavsky, A. and Dake, K. (1990). “Theories of risk perception: who fears what and why?”. *Daedalus*, 112: 41-60.

World Bank (2000) “World Bank Project Improves Risk Management and Earthquake Mitigation in Turkey”, *News Release* No: 2000/8/ECATR, World Bank. http://www1.worldbank.org/finance/assets/images/tcip_release.pdf, Last visited on 21.10.2009.

Yazıcı, S. (2005). “The Turkish Catastrophe Insurance Pool (TCIP) and Compulsory Earthquake Insurance Scheme”, *Catastrophic Risks and Insurance*, OECD.

APPENDIX A

RELATED LEGISLATION WITH THE ZDS SYSTEM

THE ZDS DECREE NO. 587

Kanun Hük.Kar.nin Tarihi : 25/11/1999 No :587
Yetki Kanununun Tarihi : 27/8/1999 No :4452
Yayımlandığı R.G.Tarihi : 27/12/1999 No : 23919 Mük.
V Tertip Düsturun Cildi : 39 Sh :

Genel Gerekçe

17 Ağustos 1999 tarihinde Marmara Bölgesinde ve 12 Kasım 1999 tarihinde Düzce ve çevresinde meydana gelen ve bölgede can ve mal kaybına neden olan depremler, ülkemizde deprem afetinin nelere yol aşabileceğini tekrar gözönüne sermiştir.

Depremler, başta afetin meydana geldiği bölgeler olmak üzere tüm ülkeyi etkilemekte ve dolayısıyla ülkede yaşayan vatandaşların hepsi depremin sonuçları gerçeğiyle karşı karşıya kalmaktadır. Ortaya çıkan maddi zararların telafi edilmesi, deprem bölgesinde normal hayata dönülebilmesi, acil yardıma ihtiyaç duyan kimselerin bu ihtiyaçlarının giderilmesi ve benzeri için yapılan harcamaları ülke ekonomisine büyük bir yük getirmektedir. Ğlkemiz topraklarının neredeyse tamamının deprem riski taşıması ve gelecekte de böyle afetler meydana gelmesi gerçeği nedeniyle, bu konularda yeni düzenlemelere gidilmesi zorunlu görülmektedir.

Deprem sigortasının geliştirilmesine yönelik olarak yapılan çalışmalar, 1998 Adana depreminden sonra yeni bir ivme kazanmış olup, söz konusu çalışmalar için Dünya Bankasından mali ve teknik destek sağlanmış bulunmaktadır. Bu konuda deprem tehlikesi itibariyla bencer yapıda bulunan gelişmiş ülkelerde bu denli yüksek deprem zararlarının telafisindeki en etkili yöntem olan ve ülke genelinde katılım sağlanan deprem havuzu sisteminin yağadığımız deprem felaketlerinden sonra ülkemizde de bir an evvel yerleştirilmesi amacıyla Doğal Afet Sigortaları Kurumu oluşturulmuştur.

Toplumun sigorta konusunda yeterli bilince sahip olmaması ve s.gorta sektörünün mevcut mali gücünün ülke çapında yaygın bir sigorta programını yürütebilecek düzeyde olmaması nedeniyle deprem sigortasında yeni bir yapılanmaya gitmek ve zorunlu sigorta uygulamasına geçmek kaçınılmaz görülmektedir. 17 Ağustos 1999 ve 12 Kasım 1999 tarihlerinde meydana gelen depremlerin sonuçları da bu durumu teyit eder niteliktedir.

Konusunda uzman kişilerden oluşacak bir Kurul tarafından yönetilecel Doğal Afet Sigortaları Kurumu yoluyla, Kanun Hükmünde Kararnamenin kapsamındaki bütün konutların deprem sigortası güvencesine kavuşturulmasını öngören yeni sistem, temel olarak şunları amaçlamaktadır:

a) Kapsamdaki bütün konutları, ödenebilir bir prim karşılığında sigorta kapsamına almak,

b) Devletin depremlerden kaynaklanan mali yükünü azaltmak,

c) Deprem riskini sigorta yoluyla uluslararası reasürans ve sermaye piyasalarına dağıtmak,

d) Detaylı risk modelleri yoluyla zemin şartlarına ve yapı özelliklerine göre prim fiyatlandırması yaparak bina standartlarının kalitesini yükseltmek,

e) Sigorta sistemini sağlıklı yapı üretiminde bir araç olarak kullanmak,

f) Hasar azaltıcı yöntem ve uygulamalara ilişkin çalışmaları desteklemek.

Söz konusu ihtiyaçları karşılamak üzere, 27/8/11999 tarihli ve 4452 sayılı Doğal Afetlere Karşı Alınacak Önlemler ve Doğal Afetler Nedeniyle Doğan Zararların Giderilmesi için Yapılacak Düzenlemeler Hakkında Yetki Kanunu çerçevesinde bu Kanun Hükmünde Kararname hazırlanmıştır.

587 Sayılı KHK - Zorunlu Deprem Sigortasına Dair Kanun Hükmünde Kararname

Zorunlu Deprem Sigortasının düzenlenmesi; 4484 sayılı Kanunla değişik 27/8/1999 tarihli ve 4452 sayılı Kanunun verdiği yetkiye dayanılarak, Bakanlar Kurulu'nca 25.11.1999 tarihinde kararlaştırılmıştır.

Amaç

Madde 1 - Bu Kanun Hükmünde Kararnamenin amacı, meydana gelecek deprem afeti sonucu bina maliklerinin veya intifa hakkı sahiplerinin, binaların ziyaı veya hasarlanması nedeniyle uğrayacakları maddî zararlarının karşılanmasını teminen zorunlu deprem sigortası yaptırmalarına ilişkin usul ve esasları belirlemektir.

Kapsam

Madde 2 - 634 sayılı Kat Mülkiyeti Kanunu kapsamındaki bağımsız bölümler, tapuya kayıtlı ve özel mülkiyete tabi taşınmazlar üzerinde mesken olarak inşa edilmiş binalar, bu binaların içinde yer alan ve ticarethane, büro ve benzeri amaçlarla kullanılan bağımsız bölümler ile doğal afetler nedeniyle devlet tarafından yaptırılan veya verilen kredi ile yapılan meskenler zorunlu deprem sigortasına tabidir.

Kamu kuruluşlarına ait binalar ile köy yerleşik alanlarında yapılan binalar bu Kanun Hükmünde Kararname kapsamında Zorunlu Deprem Sigortasına tabi değildir.

Tanımlar

Madde 3 - Bu Kanun Hükmünde Kararnamede geçen;

a) Bakan veya Bakanlık: Hazine Müsteşarlığının bağlı bulunduğu Bakan veya Bakanlığı,

b) Müsteşarlık: Hazine Müsteşarlığını,

c) Kurum: Doğal Afet Sigortaları Kurumunu,

d) Kurul: Doğal Afet Sigortaları Kurumu Yönetim Kurulunu,

e) Zorunlu Deprem Sigortası: Depremin doğrudan veya dolaylı neden olacağı maddi zararları, 10 uncu madde gereğince belirlenen tutara kadar teminat altına alan zorunlu sigortayı, ifade eder.

Doğal Afet Sigortaları Kurumu

Madde 4 - Sigorta yapmak ve bu Kanun Hükmünde Kararname ile kendisine verilen diğer görevleri yerine getirmek üzere, Bakanlık nezdinde kamu tüzel kişiliğini haiz “Doğal Afet Sigortaları Kurumu” kurulmuştur.

Kurum, 1050 sayılı Muhasebei Umumiye Kanunu, 3346 sayılı Kamu İktisadi Teşebbüsleri ile Fonların Türkiye Büyük Millet Meclisince Denetlenmesinin Düzenlenmesi Hakkında Kanun, 832 sayılı Sayıştay Kanunu, 2886 sayılı Devlet İhale Kanunu ve 6245 sayılı Harcırah Kanununa tabi değildir.

Kurumun sigorta primi alacakları, 6183 sayılı Amme Alacaklarının Tahsil Usulü Hakkında Kanun hükümlerine göre tahsil edilir.

Kurumun yıllık hesap, işlem ve harcamaları Müsteşarlık tarafından denetlenir.

Vergiden Muafiyet

Madde 5 - Kurum ve gelirleri her türlü vergi, resim ve harçtan muaftır.

Kurumun Yönetimi

Madde 6 - Kurum, biri başkan olmak üzere toplam yedi üyeden oluşan “Doğal Afet Sigortaları Kurumu Yönetim Kurulu” tarafından yönetilir.

Kurumun teknik işleri; Müsteşarlık tarafından bir sözleşme ile bir sigorta veya reasürans şirketine Kurum idarecisi sıfatıyla yürütülmek üzere verilir. Sözleşme, en fazla beş yıllık süre için yapılır ve aynı usule göre yenilenebilir.

Doğal Afet Sigortaları Kurumu Yönetim Kurulu

Madde 7 - Kurul üyeleri aşağıdaki kişilerden oluşur :

a) Başbakanlığı temsilen Başbakanlık Müsteşarınca belirlenecek en az genel müdür yardımcısı düzeyinde bir üye,

b) Müsteşarlığı temsilen Sigortacılık Genel Müdürlüğünden en az genel müdür yardımcısı düzeyinde bir üye,

c) Bayındırlık ve İskân Bakanlığını temsilen doğal afetler konusunda deneyimli en az genel müdür yardımcısı düzeyinde bir üye,

d) Sermaye Piyasası Kurulunu temsilen fon yönetiminde deneyimli en az daire başkanı düzeyinde bir üye,

e) Türkiye Sigorta ve Reasürans Şirketleri Birliğini temsilen sigortacılık ve reasürans konusunda en az yedi yıl deneyimli bir üye,

f) İnşaat, jeofizik, jeoloji mühendisliği veya dengi bölümlerinden mezun ve deprem konusunda en az yedi yıl deneyimli, Müsteşarlıkça belirlenecek bir üye,

g) Kurum idarecisini temsilen en az genel müdür yardımcısı düzeyinde bir üye.

Kurul üyeleri, Müsteşarlığın teklifi üzerine Bakan tarafından atanır. Bakan, üyeler arasından birini başkan olarak görevlendirir.

Kurul üyeliğine atanan kimseler beş sene için görev yaparlar ve en fazla iki kere atanabilirler.

Kurula atanan üyeler, temsil ettikleri kuruluşlardan ayrıldıkları takdirde Kurul üyelikleri sona erer. Bu nedenle veya diğer herhangi bir nedenle üyelikleri sona erenlerin yerlerine ilgili kuruluş tarafından en geç iki ay içinde yeni bir üye seçilir ve yukarıda belirtilen usule göre atamaları yapılır. Bu şekilde atananlar, yerine atandıkları üyelerin sürelerini tamamlarlar.

Kurul üyelerinin 657 sayılı Devlet Memurları Kanununun değişik 48 inci maddesinin (A) bendinin (1), (4), (5), (6) ve (7) nci alt bentlerinde belirtilen şartları taşımaları zorunludur.

Kurul en az beş üyenin katılımıyla toplanır ve kararlarını en az dört üyenin aynı yöndeki oyuyla alır.

Kurulun temsili başkan tarafından, Kurulca alınan kararların yürütülmesi Kurum idarecisi tarafından yapılır.

Kurul başkan ve üyelerine kamu iktisadi teşebbüslerinde yönetim kurulu başkan ve üyelerine ödenen aylık ücret ve diğer ödemeler tutarında ücret ödenir.

Kurulun Görevleri

Madde 8 - Kurulun görevleri şunlardır:

a) Kurumun işleyişine ilişkin politikaları tespit etmek ve çalışma planını düzenlemek,

b) Kurum idarecisinin çalışma usul ve esaslarını belirlemek,

c) Kurum nam ve hesabına zorunlu deprem sigortası sözleşmesi yapmaya yetkili sigorta şirketlerini ve uymaları gerekli usul ve esasları Müsteşarlığın görüşünü alarak belirlemek,

d) Tazminat ödemelerine ilişkin usul ve esasları belirlemek ve tazminat ödemelerinin en kısa sürede yapılmasını sağlamak,

e) Risk paylaşımı ve reasürans planını onaylamak,

f) Kurum kaynaklarının yatırıma yönlendirilmesine ilişkin usul ve esasları tespit etmek,

g) Halkla ilişkiler ve tanıtım kampanyaları yapılmasına karar vermek,

h) Zorunlu Deprem Sigortasına tabi bütün binaların sigorta kapsamına alınmasını temin için gerekli tedbirleri almak.

Kurul, görev alanına giren konularda bilimsel çalışma ve araştırmalar yaptırabilir ve gerekli gördüğü takdirde; kadro karşılığı aranmaksızın, Türkiye Cumhuriyeti vatandaşı veya yabancı, proje süresiyle sınırlı olmak kaydıyla özel sözleşmeli danışman çalıştırabilir.

Sigorta Yapma ve Yaptırma Zorunluluğu

Madde 9 - Bu Kanun Hükmünde Kararname kapsamındaki bağımsız bölümler ve binalar için, malikler veya varsa intifa hakkı sahipleri tarafından zorunlu deprem sigortası yaptırılır.

Bu Kanun Hükmünde Kararnamenin yayımı tarihinden sonra mesken olarak inşa edilecek bağımsız bölümler ve binalar için, ilgili mevzuat çerçevesinde inşaat ruhsatı alınmış olması kaydıyla, iskan izninden veya içinde yaşanmaya başlanmasından itibaren bir ay içinde zorunlu deprem sigortası yaptırılır.

İlgili sigorta şirketi, sigorta sözleşmesinin bitiminden en az bir ay önce taahütlü mektup, telgraf ya da noter kanalıyla sözleşmenin sona ereceğini ve yeni bir sigorta yaptırma zorunluluğunu sözleşme sahiplerine bildirir. Sigorta sözleşmesinin, sona ermesinden itibaren bir ay içerisinde yenilenmemesi durumunda Kurumun sigortadan kaynaklanan sorumluluğu sona erer.

Sigorta Teminatı, Tarife ve Talimatlar, Komisyonlar

Madde 10 - Zorunlu sigortaya ilişkin teminat tutarları, genel şartları, tarife ve talimatları, primlerin ödenme usul ve esasları ile Kurum idarecisine ve yetkili sigorta şirketlerine ödenecek komisyonlar Bakanlıkça tespit edilir ve Resmi Gazete'de yayımlanır.

Sigorta primlerinin tespitinde; binanın yüzölçümü, inşaat sınıfı ve kalitesi, binanın üzerinde bulunduğu arazinin jeolojik özellikleri, deprem riski ve benzeri faktörler dikkate alınır.

Devletin Afetlerle İlgili Mevzuattan Kaynaklanan Yükümlülükleri

Madde 11 - Devletin, 7269 sayılı Umumî Hayata Müessir Afetler Dolayısiyle Alınacak Tedbirlerle Yapılacak Yardımlara Dair Kanundan ve diğer kanunlardan doğan konut kredisi açma ve bina yaptırma yükümlülükleri, deprem nedeniyle sigorta kapsamındaki binalarda meydana gelen ziya ve hasarlar sonucu uğranılan maddi zararlar için Kurum tarafından tazminat ödenmesiyle birlikte ortadan kalkar.

9 uncu madde gereğince cari bir zorunlu deprem sigortası bulunmayanlar, bu sigorta kapsamında karşılanacak zararlar için doğal afetlerle ilgili mevzuat çerçevesinde hak sahibi olamazlar.

Sigorta Yükümlülerinin Saptanması ve İzlenmesi

Madde 12 - Sigorta yaptırmakla yükümlü olanlar, Kurum tarafından tespit edilir. Bu işlem sırasında Kurum, ilgili valilik veya belediye ile tapu sicil müdürlüklerinin kayıtlarından yararlanır.

Kamu kuruluşları, zorunlu deprem sigortasının yaptırılmış ve priminin ödenmiş olduğu belgelenmedikçe bu sigortaya tabi binalarla ilgili tapu tescil işlemleri dahil hiçbir işlem yapmazlar.

Menfaat Sahibinin Değişmesi

Madde 13 - Menfaat sahibinin değişmesi halinde sigorta, yeni menfaat sahibi ile devam eder.

Sigortalının Mükellefiyeti

Madde 14 - Binanın ve her bir bağımsız bölümün projeye aykırı olarak ve taşıyıcı sistemi etkileyecek şekilde tadil edilmesine veya zayıflatılmasına neden olan veya buna imkan veren malik, meydana gelen zararın bu nedenle ortaya çıktığı veya arttığı tutar kadar tazminat alma hakkını kaybeder.

Kurumun Halefiyeti

Madde 15 - Tazminatı ödeyen Kurum, yaptığı ödeme tutarınca hukuken sigortalının yerine geçer.

Halefiyet, sigortalının zararına olarak ileri sürülemez.

Kurumun Kaynaklarının Kullanılabileceği Yerler

Madde 16 - Kurumun kaynakları, Kurum tarafından ve sadece aşağıdaki amaçlar doğrultusunda kullanılabilir:

a) Kurum tarafından sigorta edilen binalara ait tazminat ödemeleri,

b) Kurumun yönetimi ve işleyişi için gerekli olan bütün masraflar ile Kurum idarecisine ödenecek komisyon,

c) Reasürans, sermaye ve benzeri piyasalardan sağlanan korumaya ilişkin ödemeler,

d) Kurumun görev alanına giren konularda yaptıracağı bilimsel çalışma ve araştırmalara ilişkin ödemeler,

e) Danışmanlık hizmetlerine (reasürans, yatırım, risk modellemesi gibi) ilişkin ödemeler,

f) Halkla ilişkiler ve tanıtım kampanyalarına ilişkin ödemeler,

g) Yetkili sigorta şirketlerine ödenecek komisyonlar,

h) Hasar tespit işlemlerine ilişkin ödemeler,

i) Kurumun devletten aldığı avansların geri ödenmesi.

Kurum Kaynaklarının Yetersiz Kalması

Madde 17 - Kurum, sigortadan kaynaklanan toplam yükümlülüklerini ve sahip olduğu kaynakları dikkate alarak reasürans, sermaye ve benzeri piyasalardan sigortacılık tekniğinin gerektirdiği şekilde ve yeterli düzeyde koruma temin eder. Ancak, sigortalı hasarın beklenenin üstünde olması ve bunun Kurum kaynaklarını ve temin edilen koruma miktarlarını aşması durumunda, ortaya çıkan zarar, Kurum kaynakları ve koruma miktarının toplamının zorunlu sigorta kapsamında ödenmesi gerekli toplam tazminata olan oranı dahilinde karşılanır.

Yönetmelik

Madde 18 - Kurulun çalışma usul ve esasları Bakanlıkça çıkarılacak yönetmelikle düzenlenir.

Geçici Madde 1- Kurul başkan ve üyeleri, bu Kanun Hükmünde Kararnamenin yürürlüğe girdiği tarihten itibaren üç ay içinde atanırlar. İlk defa atanan üyelerden başkan ve Kurum idarecisini temsilen atanan üye dışında, üçüncü yılın sonunda kura sonucunda belirlenecek üç üyenin yerine, bu Kanun Hükmünde Kararnamede belirtilen hükümlere uygun olarak yeni üye ataması yapılır.

Yürürlük

Madde 19 - Bu Kanun Hükmünde Kararnamenin 9 uncu maddesi hükmü yayımından dokuz ay sonra, 11 inci maddesinin ikinci fıkrası hükmü yayımından onbeş ay sonra, diğer hükümleri ise yayımı tarihinde yürürlüğe girer.

Yürütme

Madde 20 - Bu Kanun Hükmünde Kararname hükümlerini Bakanlar Kurulu yürütür.

GENERAL CONDITIONS OF THE ZDS SYSTEM

Genel Şartlar

Hazine Müsteşarlığından: [R.G. Tarihi: 12/12/2002, Sayı:24961]

A- SİGORTA KAPSAMI

A.1- Sigortanın Kapsamı

587 sayılı Kanun Hükmünde Kararname gereğince, 634 sayılı Kat Mülkiyeti Kanunu kapsamındaki bağımsız bölümler, tapuya kayıtlı ve özel mülkiyete tabi taşınmazlar üzerinde mesken olarak inşa edilmiş binalar, bu binalar içinde yer alan ve ticarethane, büro ve benzeri amaçlarla kullanılan bağımsız bölümler ile doğal afetler nedeniyle devlet tarafından yaptırılan veya verilen kredi ile yapılan meskenler Zorunlu Deprem Sigortasına tabidir.

Bu sigorta ile, depremin, yangın, infilak ve yer kayması dahil, sigortalı binalarda doğrudan neden olacağı maddi zararlar (temeller, ana duvarlar,bağımsız bölümleri ayıran ortak duvarlar, tavan ve tabanlar,merdivenler, sahanlıklar, koridorlar, çatılar ve bacalarda meydana gelenler de dahil olmak üzere), sigorta bedeline kadar Doğal Afet Sigortaları Kurumu tarafından teminat altına alınmıştır.

A.2- Sigorta Kapsamı Dışında Kalan Binalar

2.1- Kamu kurum ve kuruluşlarına ait binalar,
2.2- Köy yerleşim alanlarında yapılan binalar,
2.3- Tamamı ticari veya sınai amaçla kullanılan binalar,
2.4- 27 Aralık 1999 tarihinden sonra inşa edilmiş olan ancak ilgili mevzuat çerçevesinde inşaat ruhsatı bulunmayan binalar.

A.3 - Teminat Dışında Kalan Haller

Aşağıdaki haller sigorta teminatının dışındadır:
3.1- Enkaz kaldırma masrafları, kar kaybı, iş durması, kira mahrumiyeti, alternatif ikametgah ve işyeri masrafları, mali sorumluluklar ve benzeri başkaca ileri sürülebilecek diğer bütün dolaylı zararlar,
3.2- Her türlü taşınır mal, eşya ve benzerleri,
3.3- Ölüm dahil olmak üzere tüm bedeni zararlar,
3.4- Manevi tazminat talepleri.

A.4- Sigorta Bedelinin Tespiti

Sigorta bedelinin tespitinde, sigorta edilen meskenin yapı tarzı için Hazine Müsteşarlığınca yayımlanan "Zorunlu Deprem Sigortası Tarife ve Talimatı"nda belirlenen metrekare bedeli ile aynı meskenin brüt yüzölçümünün (veya yaklaşık yüzölçümünün) çarpılması sonucu bulunan tutar esas alınır. Zorunlu Deprem Sigortası yapılan bir meskenin sigorta bedeli, her halde "Zorunlu Deprem Sigortası Tarife ve Talimatı"nda belirlenen azami teminat tutarından çok olamaz.

A.5- Aşkın Sigorta

Sigorta bedeli, sigortalanan meskenin değerini aşarsa, sigortanın bu değeri aşan kısmı geçersizdir. Cari yıla ait fazla alınan prim sigorta ettirene gün esası üzerinden iade edilir.

A.6- Muafiyet

Her bir hasarda, sigorta bedelinin %2'si oranında tenzili muafiyet uygulanır. Doğal Afet Sigortaları Kurumu hasarın bu şekilde bulunan muafiyet miktarını aşan kısmından sorumludur. Muafiyet uygulaması açısından, her bir 72 saatlik dönem bir hasar sayılır.

A.7- Sigortanın Başlangıcı ve Sonu

Bu sigorta sözleşmesinin süresi bir yıldır.Sigorta, poliçede başlama ve sona erme tarihleri olarak yazılan günlerde, aksi kararlaştırılmadıkça, Türkiye saati ile öğleyin saat 12.00'de başlar ve öğleyin saat 12.00'de sona erer.

B- HASAR VE TAZMİNAT

B.1- Rizikonun Gerçekleşmesi Halinde, Sigorta Ettirenin Yükümlülükleri

Sigorta ettiren, rizikonun gerçekleşmesi halinde, aşağıdaki hususları yerine getirmekle yükümlüdür.

1.1- Rizikonun gerçekleştiğini öğrendiği tarihten itibaren en geç onbeş işgünü içinde Doğal Afet Sigortaları Kurumuna veya Kurum nam ve hesabına sözleşmeyi yapan sigorta şirketine bildirimde bulunmak,

1.2- Doğal Afet Sigortaları Kurumu görevlilerinin veya yetkili kıldığı kimselerin, hasara uğrayan binalara makul amaçlarla ve uygun şekillerde girmesine ve zararı azaltmaya yönelik girişimlerde bulunmasına izin vermek,

1.3- Doğal Afet Sigortaları Kurumunun isteği üzerine zarar miktarıyla delilleri saptamaya, rücu hakkının kullanılmasına yararlı ve sigorta ettiren için sağlanması mümkün gerekli bilgi ve belgeleri, gecikmeksizin Doğal Afet Sigortaları Kurumuna vermek,

1.4- Zararın tahmini miktarını belirtir yazılı bir bildirimi, makul ve uygun bir süre içinde Doğal Afet Sigortaları Kurumuna veya yetkili kıldığı kimselere vermek,

1.5- Sigortalı bina/yer üzerinde Zorunlu Deprem Sigortası dışında, deprem teminatı bulunan başkaca sigorta sözleşmeleri varsa bunları Doğal Afet Sigortaları Kurumuna bildirmek.

B.2- Hasarın Tesbiti

Bu sözleşme ile sigorta edilmiş binalarda meydana gelen zararın nedeni, niteliği ve miktarı Doğal Afet Sigortaları Kurumunun veya yetkili kıldığı kimselerin belirlemelerine göre taraflar arasında yapılacak anlaşmayla tesbit edilir.

Taraflar zarar miktarında anlaşamadıkları takdirde, zarar miktarının tayini, hakem-bilirkişilerce aşağıdaki esaslara uyulmak suretiyle saptanır ve Doğal Afet Sigortaları Kurumundan tazminat talep edilmesi veya Doğal Afet Sigortaları Kurumunun dava edilmesi halinde zarar miktarıyla ilgili hakem-bilirkişi raporu tazminatın saptanmasına esas teşkil eder. Şu kadar ki, tek hakem-bilirkişi seçilmiş ise atandığı tarihten itibaren, diğer hallerde ise üçüncü hakem-bilirkişinin seçilmesinden itibaren en geç üç ay içerisinde ve her halükarda rizikonun gerçekleştiği tarihten itibaren altı ay içinde raporun tebliğ edilememesi halinde taraflar zarar miktarını her türlü delille ispat edebilirler.

Taraflar, uyuşmazlığın çözümü için tek hakem-bilirkişi seçiminde anlaşamadıkları takdirde, taraflardan her biri kendi hakem-bilirkişisini seçer ve bu hususu noter aracılığı ile diğer tarafa bildirir. Taraflarca seçilen hakem-bilirkişiler ilk toplantı tarihinden itibaren yedi gün içerisinde ve incelemeye geçmeden önce, bir üçüncü hakem-bilirkişi seçerler ve bunu bir tutanakla saptarlar. Üçüncü hakem-bilirkişi, ancak taraflarca seçilen hakem-bilirkişilerin anlaşamadıkları hususlarda, anlaşamadıkları hadler içinde kalmak suretiyle, diğer hakem-bilirkişilerle birlikte tek bir rapor halinde karar vermeye yetkilidir. Hakem-bilirkişi raporu taraflara aynı zamanda tebliğ edilir.

Taraflardan herhangi biri, diğer tarafça yapılan tebliğden itibaren 15 gün içinde hakem-bilirkişisini seçmez, yahut taraflarca seçilen hakem-bilirkişiler üçüncü hakem bilirkişinin seçimi konusunda yedi gün içinde anlaşamazlarsa, üçüncü hakem-bilirkişi taraflardan birinin isteği üzerine hasar yerindeki ticaret davalarına bakmaya yetkili mahkeme tarafından uzman kişiler arasından seçilir.

Hakem-bilirkişilere, uzmanlıklarının yeterli olmadığı nedeniyle itiraz olunabilir. Hakem-bilirkişinin kimliğinin öğrenilmesinden sonra yedi gün içerisinde kullanılmayan itiraz hakkı düşer.

Hakem-bilirkişi ölür, görevden çekilir veya reddedilir ise, yerine aynı usule göre yenisi seçilir ve göreve kalınan yerden devam olunur.

Hakem-bilirkişiler, zarar konusunun saptanması konusunda gerekli görecekleri deliller ile sigortalı binanın rizikonun gerçekleşmesi sırasındaki değerini saptamaya yarayacak kayıt ve belgeleri isteyebilir ve hasar yerinde incelemede bulunabilir.

Hakem-bilirkişilerin veya üçüncü hakem-bilirkişinin zarar konusunda verecekleri karar kesindir, tarafları bağlar.

Taraflar kendi seçtikleri hakem-bilirkişilerin ücret ve masraflarını öderler. Tek hakem-bilirkişinin veya üçüncü hakem-bilirkişinin ücret ve masrafları taraflarca yarı yarıya ödenir.

Zarar miktarının saptanması bu sözleşmede ve mevzuatta mevcut hüküm ve şartları ve bunların ileri sürülmesini etkilemez.

B.3- Tazminatın Hesabı

3.1- Sigorta tazminatının hesabında, rizikonun gerçekleştiği yer ve tarihte, binanın piyasa rayiçlerine göre bulunan yeni inşa bedeli esas alınır. Ancak sigorta tazminatı, hiç bir durumda sigorta bedelinden fazla olamaz.

3.2- Doğal Afet Sigortaları Kurumu hasar miktarına ilişkin belgelerin kendisine verilmesinden itibaren mümkün olan en kısa süre içerisinde gerekli incelemeleri tamamlayıp hasar ve tazminat miktarını tespit ederek sigortalıya bildirmek zorundadır.

B.4- Tazminatın Ödenmesi

Tazminat miktarının yasa ve bu poliçe hükümlerine göre tespit edilmesinden sonra Doğal Afet Sigortaları Kurumu, sigorta bedelini aşmamak kaydıyla kesinleşmiş olan tazminat miktarını en geç takip eden bir ay içerisinde hak sahibine ödemek zorundadır.

B.5- Tazminat Hakkının Eksilmesi veya Düşmesi

Binanın ve her bir bağımsız bölümün projeye aykırı olarak ve taşıyıcı sistemi etkileyecek şekilde tadil edilmesine veya zayıflatılmasına neden olan veya buna imkan veren malik veya intifa hakkı sahibi, meydana gelen zararın bu nedenle ortaya çıktığının veya arttığının tesbit edilmesi durumunda bu tutar kadar tazminat alma hakkını kaybeder.

Sigorta ettirenin, sigorta süresi içinde sigortalı meskende mevzuata aykırı değişiklik yapması halinde Doğal Afet Sigortaları Kurumu sözleşmeyi fesh edebilir.

B.6- Hasar ve Tazminatın Sonuçları

6.1- Doğal Afet Sigortaları Kurumu, yaptığı tazminat ödemesi tutarınca hukuken sigortalının yerine geçer ve sigortalının zarardan dolayı üçüncü şahıslara karşı dava hakkı varsa bu hak, tazmin ettiği bedel nisbetinde Doğal Afet Sigortaları Kurumuna intikal eder.

6.2- Deprem sonucu tam hasar meydana geldiği takdirde, tazminatın ödenmesi ile birlikte sigorta teminatı sona erer. Kısmi hasar halinde, sigorta bedeli, rizikonun gerçekleştiği tarihten itibaren, ödenen tazminat tutarı kadar eksilir.

Sigorta bedelinin eksildiği hallerde, hasarlı binanın, hasardan bir gün önceki haline getirildiği tarihten itibaren başlamak üzere, gün esası ile prim alınmak suretiyle sigorta bedeli yükseltilir.

C- ÇEŞİTLİ HÜKÜMLER

C.1- Sigorta Ücretinin Ödenmesi, Doğal Afet Sigortaları Kurumunun Sorumluluğunun Başlaması ve Sona Ermesi

Sigorta primi her türlü vergi, resim ve harçtan muaftır.

Sigorta priminin tamamı, sözleşme yapılır yapılmaz poliçenin teslimi karşılığında peşinen ve nakden ödenir. Sigorta priminin tamamı, poliçenin teslimine rağmen ödenmemiş ise Doğal Afet Sigortaları Kurumunun sorumluluğu başlamaz. Bu şart poliçenin ön yüzüne yazılır. Sigorta primi alacakları, 6183 sayılı Amme Alacaklarının Tahsil Usulü Hakkında Kanun hükümlerine göre tahsil edilir.

Malikler veya varsa intifa hakkı sahipleri, sigorta sözleşmelerini her yıl yenilemek zorundadır. Sigorta sözleşmesinin yenilenmemesi durumunda Doğal Afet Sigortaları Kurumunun sorumluluğu sona erer.

Bu sigorta sözleşmesi Doğal Afet Sigortaları Kurumu nam ve hesabına zorunlu deprem sigorta sözleşmesi yapmak üzere aracı sıfatıyla yetkili kılınan sigorta şirketi tarafından yapılmıştır.

C.2- Sigorta Ettirenin Beyan Yükümlülüğü ve İptaller

Doğal Afet Sigortaları Kurumu bu sigorta sözleşmesini, sigorta ettirenin, rizikonun gerçek durumunu bildiren beyanına dayanarak yapmıştır.

Sigorta ettirenin beyanının gerçeğe aykırı veya eksik olması halinde Doğal Afet Sigortaları Kurumunun sözleşmeyi daha ağır şartlarla yapmasını gerektirecek durumlarda, Doğal Afet Sigortaları Kurumu veya aracı kılınan ilgili sigorta şirketi durumu öğrendiği andan itibaren 15 gün içerisinde prim farkının ödenmesi hususunu

sigorta ettirene ihtar ile prim farkını talep ve tahsil eder. Prim farkının süresinde istenilmemesi halinde fesih hakkı düşer.

Gerçeğe aykırı beyan hali, zararı doğuran olayın meydana gelmesinden sonra öğrenilmişse, Doğal Afet Sigortaları Kurumu,bu zarardan dolayı ödenmiş ve ödenecek tazminatın;

a) Gerçeğe aykırı beyan, kasden yapılmış olması halinde tamamı için,

b) Kasıt olmaması halinde ise, ödenecek tazminatın, alınan prim ile alınması gereken prim arasındaki oran kadar dışında kalan miktarı için, sigorta ettirene rücu edebilir.

Aynı yer için birden fazla zorunlu deprem sigortası yaptırılmış olduğunun ya da A.2 maddesi uyarınca sigorta kapsamı dışında kalan bir yere yanlışlıkla Zorunlu Deprem Sigortası poliçesi düzenlendiğinin sigorta ettiren tarafından belgelendirilmesi durumunda, zorunlu deprem sigortası sözleşmesi, başlangıcından itibaren iptal edilir ve primin tamamı sigorta ettirene iade edilir.

Diğer taraftan,sigorta sözleşmesinin yürürlükte olduğu süre içerisinde, sigorta konusu yerin A.1 maddesi kapsamındaki durumlar dışında kalan bir nedenle ortadan kalkması ya da sigortalı yerin sigorta kapsamı dışına çıkması hallerinde, bu durumun sigorta ettiren tarafından belgelendirilmesi kaydıyla, sigorta sözleşmesi, bildirimde bulunulan tarihten itibaren geçerli olmak üzere iptal edilir. Bu durumda, sözleşmenin iptal tarihi ile başlangıcındaki bitiş tarihi arasındaki süreye isabet eden prim tutarı sigorta ettirene gün esası üzerinden iade edilir.

C.3- Birden Çok Sigorta

Aynı bina/bağımsız bölüm için birden çok Zorunlu Deprem Sigortası yaptırılamaz. Ancak, Zorunlu Deprem Sigortası yapılan bağımsız bölüm veya binanın değeri Zorunlu Deprem Sigortası ile belirlenen sigorta bedeli tutarının üzerinde ise, bu tutarın üzerindeki kısım için, Zorunlu Deprem Sigortasının yapılmış olması kaydıyla, sigorta şirketleri tarafından ihtiyari deprem sigortası yapılabilir.

C.4- Menfaat Sahibinin Değişmesi

Sözleşme süresi içinde, menfaat sahibinin değişmesi halinde, sigortanın hükmü yeni menfaat sahibi ile devam eder. Bu durumda yeni menfaat sahibi,sigortaya ait devir zeyilnamesini yaptırmak ve satış işleminin tamamlanabilmesi için zeyilnameyi ilgili tapu müdürlüğüne ibraz etmekle yükümlüdür.Bunun dışındaki hallerde ise, sigorta ettiren ve sigortanın varlığını öğrenen yeni menfaat sahibi, durumu 15 gün içerisinde sözleşmeye aracılık yapan sigorta şirketine bildirmekle yükümlüdür.

C.5- Tebliğ ve İhbarlar

Sigorta ettirenin bildirimleri, Doğal Afet Sigortaları Kurumu adına sözleşmeye aracılık yapan sigorta şirketine noter kanalıyla veya taahhütlü mektupla yapılır.

Doğal Afet Sigortaları Kurumu veya adına yetkili kıldığı sigorta şirketinin bildirimleri de sigorta ettirenin poliçede gösterilen adresine veya bu adres değişmişse, son bildirilen adresine aynı şekilde yapılır.

Taraflara imza karşılığı elden verilen mektup veya telgrafla yapılan bildirimler de taahhütlü mektup hükmündedir.

Doğal Afet Sigortaları Kurumu tarafından yapılan fesih ihbarı, postaya veya notere verildiği tarihten itibaren hüküm ifade eder.

C.6- Yetkili Mahkeme

Bu sigorta sözleşmesinden doğan anlaşmazlıklar nedeniyle Doğal Afet Sigortaları Kurumu aleyhine açılacak davalarda yetkili mahkeme, Doğal Afet Sigortaları Kurumunun bulunduğu veya rizikonun gerçekleştiği yerde, Doğal Afet Sigortaları Kurumu tarafından açılacak davalarda ise, davalının ikametgahının bulunduğu yerde, ticaret davalarına bakmakla görevli mahkemelerdir.

C.7- Zaman Aşımı

Sigorta sözleşmesinden doğan bütün talepler, iki yılda zaman aşımına uğrar.

C.8- Yürürlük

Bu genel şartlar 27 Eylül 2000 tarihinde yürürlüğe girer.

THE TARIFF OF THE ZDS SYSTEM

Zorunlu Deprem Sigortası Tarife ve Talimatı

Hazine Müsteşarlığından: [R.G. Tarihi: 08/09/2000, Sayı:24164]

587 sayılı "Zorunlu Deprem Sigortasına Dair Kanun Hükmünde Kararname"ye istinaden yapılacak Zorunlu Deprem Sigortasına aşağıdaki tarife ve talimatlar uygulanır.

1.Tarife

Yapı Tarzı	I. Bölge ‰	II. Bölge ‰	III. Bölge ‰	IV. Bölge ‰	V. Bölge ‰
A-Çelik, betonarme, karkas yapılar	2.20	1.55	0.83	0.55	0.44
B-Yığma Kagir Yapılar	3.85	2.75	1.43	0.60	0.50
C-Diğer Yapılar	5.50	3.53	1.76	0.78	0.58

Ödenecek prim, 3 ncü maddede belirtilen esaslara göre tespit edilen sigorta bedeline, deprem bölgesine ve yapı tarzına göre yukarıdaki tarife uygulanmak suretiyle bulunan tutara 10 TL ilave edilerek hesaplanır. İstanbul ili dahilinde bulunan rizikolar için bu tutar 15 TL olarak uygulanır. Ancak ödenecek primin asgari tutarı, deprem bölgesine ve yapı tarzına göre herhangi bir ayrım yapılmaksızın 25 TL'dir.

634 sayılı Kat Mülkiyeti Kanunu kapsamındaki apartman ve sitelerde, yönetici tarafından yaptırılan ve en az sekiz bağımsız bölümü içeren toplu sigortalarda, yukarıdaki tarife fiyatları üzerinden % 20 oranında indirim yapılır.

Poliçe süresinin sonunda sigortanın 30 gün içinde yenilenmesi durumunda, yenilenen poliçe için yukarıdaki tarife fiyatları üzerinden ayrıca %20 oranında indirim yapılır.

Deprem bölgeleri ayrımında, Bayındırlık ve İskan Bakanlığı tarafından hazırlanan "Türkiye Deprem Bölgeleri Haritası" esas alınır.

Yukarıdaki tarifede belirtilen yapı tarzlarının tanımı aşağıdaki gibidir:

A- Çelik, Betonarme Karkas Yapılar: Çelik veya betonarme taşıyıcı karkas bulunan yapılardır.

B- Yığma Kagir Yapılar: Karkas olmayan ve taşıyıcı duvarları moloz taş, kesme taş, tuğla veya boşluklu, boşluksuz beton briket gibi malzemeden yapılan, döşeme, merdiven ve tavanları beton veya betonarme olan yapılardır.

C- Diğer Yapılar: Yukarıdaki gruplara girmeyen yapılardır.

2. Azami Teminat Tutarı

Zorunlu Deprem Sigortası kapsamında, bir mesken için verilebilecek azami teminat tutarı yapı tarzı ayırımı yapılmaksızın 140 Bin TL'dir.

3. Sigorta Bedelinin Tespiti

Sigorta bedelinin tespitinde, sigorta edilen meskenin yapı tarzı için aşağıda belirtilen metrekare bedeli ile aynı meskenin brüt yüzölçümünün (veya yaklaşık yüzölçümünün) çarpılması sonucu bulunan tutar esas alınır. Zorunlu Deprem Sigortası yapılan bir meskenin sigorta bedeli, her halde 2 nci maddede belirtilen azami teminat tutarından çok olamaz.

Yapı Tarzı	Sigorta Bedeli Hesabina Esas Metrekare Bedeli (TL)
A-Çelik, betonarme, karkas yapılar	550
B-Yığma Kagir Yapılar	395
C-Diğer Yapılar	205

4. Muafiyet

Her bir hasarda, sigorta bedelinin %2'si oranında tenzili muafiyet uygulanır. Doğal Afet Sigortaları Kurumu hasarın bu şekilde bulunan muafiyet miktarını aşan kısmından sorumludur. Muafiyet uygulaması açısından, her bir 72 saatlik dönem bir hasar sayılır.

5. Sigortanın Süresi

Sigortanın süresi bir yıldır.

6. Yetkili Sigorta Şirketleri ve Primlerin Tahsili

Doğal Afet Sigortaları Kurumu nam ve hesabına Zorunlu Deprem Sigortası yapmaya yetkili sigorta şirketleri ve bu şirketlerin acenteleri tarafından yapılır. Doğal Afet Sigortaları Kurumu nam ve hesabına Zorunlu Deprem Sigortası yapmaya yetkili sigorta şirketleri, bu tarife ve talimatlara göre belirlenen prim tutarını peşin olarak tahsil ederler.

7. Yetkili Sigorta Şirketlerine Ödenecek Komisyon

Doğal Afet Sigortaları Kurumu nam ve hesabına zorunlu deprem sigortası sözleşmesi yapmaya yetkili sigorta şirketlerine, kendileri veya acenteleri tarafından yapılan zorunlu deprem sigortası primi tutarı üzerinden İstanbul ili dahilinde bulunan rizikolar için %12,5 oranında, diğer illerde bulunan rizikolar için %17,5 oranında komisyon ödenir.

Ancak, her bir sigorta sözleşmesi itibariyle yetkili sigorta şirketine ödenecek asgari komisyon 10 TL'dir. Ödenen asgari komisyonun 3 TL'si sigorta şirketine, 7 TL'si acenteye aittir. Yukarıda belirtilen oranlar kapsamında sigorta şirketine ödenecek komisyonun 10 TL'yi aşması durumunda, acenteye verilecek komisyon, asgari tutarın altına düşülmemesi kaydıyla, sigorta şirketi ve acente arasında serbestçe belirlenir."

Yetkili sigorta şirketlerine ve acentelerine, DASK Yönetim Kurulunca belirlenecek esaslar dahilinde, bir takvim yılı içinde düzenledikleri toplam poliçe sayısı dikkate alınarak, sağladıkları toplam net prim üretimi üzerinden ve % 5 oranını aşmayacak şekilde teşvik komisyonu ödenebilir.

8. İhtiyari Sigorta

Doğal Afet Sigortaları Kurumu dışındaki kişi ve kuruluşlar Zorunlu Deprem Sigortası yapamazlar. Ancak, Zorunlu Deprem Sigortası yapılan bağımsız bölüm veya binaların değerinin 3 üncü maddeye göre hesaplanan sigorta

bedelinden yüksek olması durumunda söz konusu sigorta bedelini aşan kısım için, Zorunlu Deprem Sigortasının yapılmış olması kaydıyla, sigorta şirketleri tarafından ihtiyari deprem sigortası yapılabilir.

9. Yürürlük

Bu tarife ve talimat 27 Eylül 2000 tarihinde yürürlüğe girer.

(1) 20/06/2001 tarih ve 24438 sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

(2) 03/10/2001 tarih ve 24542 sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

(3) 12/12/2002 tarih ve 24691 sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

(4) 12/08/2003 tarih ve 25197 sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

(5) 22.12.2003 tarih ve 25324 (1.Mükerrer) sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

(6) 27.11.2004 tarih ve 25653 (Asıl) sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

(7) 06.02.2006 tarih ve 26072 (Asıl) sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

(8) 20.02.2007 tarih ve 26440 (Asıl) sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

(9) 05.03.2008 tarih ve 26807 (Asıl) sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

(10) 14.11.2008 tarih ve 27054 (Asıl) sayılı Resmi Gazetede yayımlanan Zorunlu Deprem Sigortası Tarife ve Talimatında Değişiklik Yapılmasına Dair Tarife ve Talimatla değiştirilmiştir.

THE ZDS DRAFT LAW

AFET SİGORTALARI KANUNU TASARISI

T.C. Başbakanlık Kanunlar ve Kararlar Genel Müdürlüğü
Kanun Tasarısı Tarihi : 29/08/2008
Sayı: B.02.0.KKG.0.10/101-160/ 3724

BİRİNCİ BÖLÜM

Amaç, Kapsam ve Tanımlar

Amaç ve kapsam

MADDE 1- (1) Bu Kanunun amacı, binalarda deprem sonucu meydana gelebilecek maddi zararların karşılanmasını teminen yaptırılacak zorunlu deprem sigortası ile sigorta şirketlerince teminat verilemeyen veya teminat verilmesinde güçlükler bulunan çeşitli afetler ve riskler sonucu meydana gelebilecek maddi ve bedeni zararların karşılanabilmesini teminen sunulacak sigorta ve reasürans teminatlarına ilişkin usul ve esasları belirlemektir.

Tanımlar

MADDE 2- (1) Bu Kanunda geçen;

a) Bakan veya Bakanlık: Hazine Müsteşarlığının bağlı bulunduğu Bakanı veya Bakanlığı,

b) Birlik: Türkiye Sigorta ve Reasürans Şirketleri Birliğini,

c) Kurum: Doğal Afet Sigortaları Kurumunu,

ç) Müsteşarlık: Hazine Müsteşarlığını,

d) Reasürans şirketi: Türkiye'de kurulmuş reasürans şirketi ile yurtdışında kurulmuş reasürans şirketinin Türkiye'deki teşkilatını,

e) Sigorta şirketi: Türkiye'de kurulmuş sigorta şirketi ile yurtdışında kurulmuş sigorta şirketinin Türkiye'deki teşkilatını,

f) Teknik işletici: Kurumun teknik işleri ile işletmeye ilişkin iş ve işlemlerini yürüten şirketi,

g) Yönetim Kurulu: Doğal Afet Sigortaları Kurumu Yönetim Kurulunu,

ğ) Zorunlu deprem sigortası: Depremin doğrudan neden olduğu maddi zararlar ile deprem nedeniyle ortaya çıkan yangın, infilak, su basması ve yer kayması sonucu oluşan maddi zararları teminat altına alan zorunlu sigortayı,

ifade eder.

İKİNCİ BÖLÜM

Doğal Afet Sigortaları Kurumu

MADDE 3- (1) Bu Kanuna göre sunulacak sigorta ve reasürans teminatları, Bakanlık nezdinde kurulan kamu tüzel kişiliğini haiz Doğal Afet Sigortaları Kurumu tarafından verilir. Kurumun merkezi, teknik işleticinin idare merkezinin bulunduğu yerdir. Kurumun tescilli isim hakkı Müsteşarlığa aittir.

(2) Kurum ve gelirleri her türlü vergi, resim ve harçtan muaftır.

(3) Kurum ile bu Kanun kapsamında gerçekleştirilen iş ve işlemler, 2/4/1987 tarihli ve 3346 sayılı Kamu İktisadi Teşebbüsleri ile Fonların Türkiye Büyük Millet Meclisince Denetlenmesinin Düzenlenmesi Hakkında Kanun, 21/2/1967 tarihli ve 832 sayılı Sayıştay Kanunu, 10/2/1954 tarihli ve 6245 sayılı Harcırah Kanunu, 10/12/2003 tarihli ve 5018 sayılı Kamu Malî Yönetimi ve Kontrol Kanunu ile 4/1/2002 tarihli ve 4734 sayılı Kamu İhale Kanununa tâbi değildir.

(4) Kurumun taşınır ve taşınmaz varlıkları ile diğer hak, gelir ve alacakları haczedilemez, Kurum iflas yoluyla takip edilemez. Kurumun süresinde ödenmeyen sigorta primi alacakları, 21/7/1953 tarihli ve 6183 sayılı Amme Alacaklarının Tahsil Usulü Hakkında Kanun hükümlerine göre tahsil edilir.

(5) Kurumun yıllık hesap, iş ve işlemleri ile harcamaları Müsteşarlık tarafından denetlenir.

Doğal Afet Sigortaları Kurumu Yönetim Kurulu

MADDE 4- (1) Kurum, Doğal Afet Sigortaları Kurumu Yönetim Kurulu tarafından yönetilir. Yönetim Kurulu, Müsteşarlıktan ve Bayındırlık ve İskan Bakanlığından birer üye, Birlik ve Yükseköğretim Kurulu tarafından önerilecek üçer aday arasından belirlenecek birer üye ile teknik işleticinin temsilcisinden oluşur.

(2) Yönetim Kurulu üyelerinin, 14/7/1965 tarihli ve 657 sayılı Devlet Memurları Kanununun 48 inci maddesinin (A) bendinin (1), (4), (5), (6) ve (7) numaralı alt bentlerinde belirtilen şartları taşımaları, temsil ettikleri kuruluşların görev alanına giren sigortacılık, acil durum yönetimi, doğal afetler ve benzeri konulardan birinde, görevlerini yürütebilmeleri için gerekli bilgiye ve en az on yıllık deneyime sahip olmaları gereklidir. Müsteşarlık ile Bayındırlık ve İskan Bakanlığını temsilen atanacakların en az genel müdür yardımcısı düzeyinde olmaları şartı aranır.

(3) Yönetim Kurulu üyeleri, ilgili kurumların bildirimi ve Müsteşarlığın teklifi üzerine Bakan tarafından atanır. Yönetim Kuruluna Müsteşarlık temsilcisi başkanlık eder.

(4) Yönetim Kurulu üyeliğine atanan kimseler dört yıl için görev yapar ve en fazla iki defa atanabilir.

(5) Yönetim Kuruluna atanan üyeler temsil ettikleri kuruluşlardan ayrıldıkları takdirde Yönetim Kurulu üyelikleri sona erer. Yönetim Kurulu üyelerinin bu nedenle veya görev sürelerinin sona ermesi hâli hariç olmak üzere diğer herhangi bir nedenle üyeliklerinin sona ermesi durumunda yerlerine ilgili kuruluş tarafından birinci fıkrada belirtilen usule göre aday gösterilir ve bu üyelerin üçüncü fıkrada belirtilen usule göre atamaları yapılır. Bu üyeler, yerine atandıkları üyelerin sürelerini tamamlar ve her hâlde en fazla iki defa atanabilir.

(6) Yönetim Kurulu en az dört üyenin katılımıyla toplanır ve kararlarını en az üç üyenin aynı yöndeki oyuyla alır.

(7) Yönetim Kurulunun temsili başkan tarafından, Yönetim Kurulunca alınan kararların yürütülmesi teknik işletici tarafından yapılır.

(8) Yönetim Kurulu başkan ve üyelerine, kamu iktisadi teşebbüslerinde yönetim kurulu başkan ve üyelerine ödenen aylık ücret ve diğer ödemeler tutarında ücret ödenir.

Yönetim Kurulunun görevleri

MADDE 5- (1) Yönetim Kurulunun görevleri şunlardır:
a) Kurumun iş ve işlemlerine ilişkin çalışma planını düzenlemek,
b) Tazminat ödemelerine ilişkin usul ve esasların belirlenmesi ile tazminat ödemelerinin en kısa sürede yapılmasını sağlamak,
c) Risk paylaşımı, reasürans ve retrosesyon planını onaylamak,
ç) Kurum varlıklarının yatırıma yönlendirilmesine ilişkin usul ve esasları belirlemek,
d) Halkla ilişkiler, tanıtım ve eğitim kampanyaları yapılmasına karar vermek,

e) Pazarlamaya ilişkin usul ve esasları belirlemek,
f) Kurumun faaliyetleri hakkında Bakana ve Müsteşarlığa bilgi vermek,
g) Bu Kanunla ve bu Kanuna göre çıkarılan yönetmeliklerle verilen diğer görevleri yerine getirmek.

(2) Yönetim Kurulu üyeleri bu sıfatları dolayısıyla öğrenmiş oldukları bilgileri üyelik sıfatını kaybetmiş olsalar dahi Yönetim Kurulunun izni veya onayı olmaksızın açıklayamazlar.

Kurumun işlerinin yürütülmesi

MADDE 6- (1) Kurumun teknik işleri ile işletmeye ilişkin iş ve işlemleri, yangın ve doğal afetler branşında ruhsatı bulunan sigorta şirketlerinin eşit hisselerle katılımıyla, münhasıran bu amaçla kurulan ve Müsteşarlık tarafından teknik işletici olarak görevlendirilen bir anonim şirket tarafından yürütülür. Bunun gerçekleşmemesi durumunda teknik işletici, yangın ve doğal afetler branşında ruhsatı bulunan sigorta veya reasürans şirketleri arasından Müsteşarlıkça belirlenir. Teknik işleticinin belirlenmesinde; şirketin mali bünyesinin sağlamlığı, sigortacılık alanında ve uluslararası reasürans işlemleri ile afet risklerinin yönetimindeki deneyimi, teknik ve insan kaynakları alt yapısı ve benzeri hususlar dikkate alınır.

(2) Müsteşarlık, Kurum iş ve işlemlerinin yürütülmesi amacıyla teknik işleticiyle sözleşme yapar. Sözleşme en fazla beş yıllık süre için yapılır ve aynı usule göre yenilenebilir. Teknik işleticiye ödenecek işletme ücreti sözleşmede tespit edilir.

(3) Teknik işleticinin ana sözleşmesinde ve ana sözleşme değişikliklerinde Müsteşarlığın uygun görüşü **aranır.**

(4) Kurumun çalışma usul ve esasları ile teknik işleticinin yetki ve sorumlulukları Müsteşarlık tarafından hazırlanan yönetmelikle belirlenir.

Kurum tarafından verilecek teminatlar

MADDE 7- (1) Zorunlu deprem sigortası teminatı münhasıran Kurum tarafından verilir. Bu teminat, risk yönetimi açısından şartların gerekli kılması durumunda ve Bakan tarafından uygun görülmesi hâlinde sigorta şirketleri ile müştereken de verilebilir.

(2) Sigorta şirketlerince teminat verilememesi veya verilmesinde güçlükler bulunması durumunda deprem, seylap, yer kayması, fırtına, çığ, dolu, don ve benzeri doğal afetler ile terörizm ve çevre kirlenmesi ve benzeri riskler için kamu yararı açısından gerek görülmesi hâlinde sigortacılık ilkeleri gözetilerek Kurum tarafından sigorta veya reasürans teminatı verilebilir. Kurum tarafından bu teminatların hangilerinin verileceği hususu Bakanın teklifi ile Bakanlar Kurulunca belirlenir.

(3) Kurum tarafından verilen teminatlara ilişkin hesaplar, kayıtlar ve hesaplararası aktarıma ilişkin esaslar Müsteşarlık tarafından hazırlanan yönetmelikle belirlenir.

(4) Kurum tarafından verilen teminatların uygulama usul ve esasları ile sigorta şirketleriyle müşterek sigorta yapılmasına ilişkin esaslar Kurumun ve Birliğin görüşü alınarak sigortacılık ilkeleri çerçevesinde Müsteşarlık tarafından belirlenir.

(5) Kurum tarafından verilen ihtiyari teminatlara ilişkin teminat hadleri, sigorta genel şartları ile tarifelerin nasıl tespit edileceği hususu Müsteşarlık tarafından belirlenir.

Hasar fazlası desteği

MADDE 8- (1) Kurum tarafından üstlenilen riskler için ulusal ve uluslararası piyasalardan uygun koşullarda yeterli koruma sağlanamaması hâlinde, Bakanın teklifi ile Bakanlar Kurulunca belirlenecek kısmının uygun bir bedel karşılığında Devlet tarafından taahhüt edilmesine karar verilebilir.

Kurumun gelirleri ve kullanılabileceği yerler

MADDE 9- (1) Kurumun gelirleri; sigorta ve reasürans primlerinden, reasürans ve retrosesyon işlemlerinden elde edilen komisyonlardan, Kurum varlıklarından sağlanan gelirlerden ve sair gelirlerden oluşur.

(2) Kurum, tazminatların ödenmesi için gerekli görülen durumlarda yıllık prim gelirlerinin toplam tutarını geçmemek üzere Bakanın uygun görüşü ile borçlanabilir.

(3) Kurumun gelirleri, Kurum tarafından ve sadece aşağıdaki amaçlar doğrultusunda kullanılabilir.

a) Kurum tarafından verilen sigorta ve reasürans teminatlarına ilişkin tazminat ödemeleri, hasar tespit işlemlerine ilişkin ödemeler ve mahkeme masrafları,

b) Kurumun yönetimi ve işleyişi için gerekli masraflar,

c) Yurtiçi ve yurtdışı piyasalardan sağlanan reasürans ve benzeri koruma teminatlarına ilişkin ödemeler,

ç) Kurumun görev alanına giren konularda yaptıracağı çalışma ve araştırmalara ilişkin ödemeler,

d) Danışmanlık hizmetleri ve yatırım yönetimi gibi dışarıdan sağlanan hizmetlere ilişkin ödemeler,

e) Halkla ilişkiler, tanıtım ve eğitim kampanyalarına ilişkin ödemeler,

f) Sigorta şirketlerine ve diğer aracı kuruluşlara ödenen komisyonlar,

g) Kurumun aldığı borçların geri ödenmesine ilişkin faiz ve anapara ödemeleri,

ğ) Retrosesyon ve reasürans primleri ile reasürans komisyonları.

(4) Kurum varlıklarının yatırıma yönlendirilmesinde, yatırım araçları bakımından çeşitlendirme yapılır ve öncelikli olarak; varlıkların likit olması, anapara kaybı riskinin en düşük olması ve getiri oranının yüksek olması ilkeleri esas alınır.

ÜÇÜNCÜ BÖLÜM

Zorunlu Deprem Sigortası

Kapsam ve sigorta yapma zorunluluğu

MADDE 10- (1) 23/6/1965 tarihli ve 634 sayılı Kat Mülkiyeti Kanunu kapsamındaki bağımsız bölümler, tapuya kayıtlı ve özel mülkiyete tâbi taşınmazlar üzerinde mesken olarak inşa edilmiş binalar, bu binaların içinde yer alan ve ticarethane, büro ve benzeri amaçlarla kullanılan bağımsız bölümler ile doğal afetler nedeniyle Devlet tarafından yaptırılan veya sağlanan kredi ile yapılan meskenler zorunlu deprem sigortasına tâbidir.

(2) 9/11/1983 tarihli ve 2946 sayılı Kamu Konutları Kanununa tâbi olan veya kamu hizmet binası olarak kullanılan binalar ve bağımsız bölümler, köy nüfusuna kayıtlı ve köyde sürekli oturanlarca köy yerleşik alanları ve civarında ve mezralarda yapılan binalar ile Kat Mülkiyeti Kanunu kapsamında olsalar dahi tamamı ikamet dışı amaçlarla kullanılan binalar zorunlu deprem sigortasına tâbi değildir.

(3) Birinci fıkrada belirtilen binalar ve bağımsız bölümler için malikler veya intifa hakkı sahipleri tarafından zorunlu deprem sigortası yaptırılır ve bu sigorta her yıl yenilenir.

(4) Kurum, ilgili mevzuata aykırı olarak inşa edildiği, projeye aykırı olarak ve taşıyıcı sistemi olumsuz yönde etkileyecek şekilde tadil edildiği veya zayıflatıldığı tespit edilen binaları sigortalamama hakkına sahiptir.

Yükümlülerin saptanması ve sigortanın kontrolü

MADDE 11- (1) Zorunlu deprem sigortasını yaptırmakla yükümlü olanlar, 10 uncu madde hükümleri çerçevesinde Kurum tarafından tespit edilir. Mahallî idareler dahil kamu kurum ve kuruluşları ile gerçek ve tüzel kişiler, sigorta yükümlülerinin saptanması ve izlenmesine yönelik olarak Kurum tarafından kendilerinden istenecek bilgileri belirli aralıklarla ve düzenli olarak vermek zorundadır. Bu konudaki bilgi paylaşımı, gerektiği hâlde, elektronik ortamda yapılabilir.

(2) Tapu sicil müdürlükleri, maliklerin veya intifa hakkı sahiplerinin taleplerine bağlı olarak tapu kütüğünde bu sigortaya tâbi bağımsız bölümler ve binalarla ilgili tescil işlemlerini veya tapuya kayıtlı taşınmazın kayda tâbi olmayan bir taşınmaza dönüşmesi hâli hariç olmak üzere terkin işlemlerini zorunlu deprem sigortasının yaptırıldığı ve işlem tarihi itibarıyla geçerli olduğu belgelenmedikçe yapamaz.

(3) Zorunlu deprem sigortasının kapsamına giren binalar ve bağımsız bölümlerle ilgili olarak malikler veya intifa hakkı sahipleri tarafından yaptırılan su ve elektrik abonelik işlemlerinde ve bu hizmetlerin temini süresince zorunlu deprem sigortasının yaptırılması şartı aranır.

(4) İkinci ve üçüncü fıkra hükümlerinin uygulanmasına ilişkin usul ve esaslar, ilgili kurumların görüşü alınarak Müsteşarlık tarafından belirlenir.

Sigortalının sorumluluğu

MADDE 12- (1) Malik veya intifa hakkı sahibi, binanın ve her bir bağımsız bölümün projeye aykırı olarak ve taşıyıcı sistemi olumsuz yönde etkileyecek şekilde tadil edilmesine veya zayıflatılmasına karşı gerekli tedbirleri almakla yükümlüdür.

(2) Malik veya intifa hakkı sahibi, hasarın projeye aykırı olarak ve taşıyıcı sistemi olumsuz yönde etkileyecek tadilat nedeniyle ortaya çıktığının tespit edilmesi durumunda, sigortadan tazminat alma hakkını kaybeder.

Tarife ve talimatlar ile uygulama esasları ve genel şartlar

MADDE 13- (1) Zorunlu deprem sigortasına ilişkin tarife ve talimatlar ile azami teminat tutarı her yıl Bakan tarafından belirlenir ve Resmî Gazetede yayımlanır. Sigorta primlerinin tespitinde; binanın yüzölçümü, inşaat türü ve kalitesi, binanın üzerinde bulunduğu arazinin zemin özellikleri, deprem riski ve benzeri unsurlar değerlendirilir.

(2) Zorunlu deprem sigortasına ilişkin uygulama usul ve esasları ile sigorta genel şartları Müsteşarlık tarafından belirlenir.

DÖRDÜNCÜ BÖLÜM

Diğer Hükümler / Yönetmelik

MADDE 14- (1) Bu Kanunun uygulamasına ilişkin yönetmelikler bu Kanunun yayımı tarihinden itibaren bir yıl içinde yürürlüğe konulur.

Yürürlükten kaldırılan hükümler

MADDE 15- (1) 25/11/1999 tarihli ve 587 sayılı Zorunlu Deprem Sigortasına Dair Kanun Hükmünde Kararname yürürlükten kaldırılmıştır.

MADDE 16- (1) 15/5/1959 tarihli ve 7269 sayılı Umumi Hayata Müessir Afetler Dolayısiyle Alınacak Tedbirlerle Yapılacak Yardımlara Dair Kanunun 29 uncu maddesine aşağıdaki fıkra eklenmiştir.

“Bu Kanundan ve ilgili diğer mevzuattan doğan Devletin konut kredisi açma ve bina yaptırma yükümlülükleri, zorunlu deprem sigortası yaptırılmamış olmasının tespit edilmesiyle birlikte ortadan kalkar.”

GEÇİCİ MADDE 1- (1) Mülga 587 sayılı Zorunlu Deprem Sigortasına Dair Kanun Hükmünde Kararname ile kurulan Doğal Afet Sigortaları Kurumunun aktif ve pasifleri ile her türlü hak ve yükümlülükleri, hiçbir işleme gerek kalmaksızın, bu Kanunla kurulan Doğal Afet Sigortaları Kurumuna devredilmiş sayılır.

(2) Mülga 587 sayılı Zorunlu Deprem Sigortasına Dair Kanun Hükmünde Kararnamenin 7 nci maddesine göre Yönetim Kuruluna atanan üyelerden, aynı maddenin (a) ve (d) bentlerine göre atananlar hariç diğer üyeler görev sürelerinin sonuna kadar görevlerine devam eder.

GEÇİCİ MADDE 2- (1) Bu Kanunda belirtilen yönetmelik ve diğer düzenlemeler yürürlüğe girinceye kadar, bunların düzenleyeceği konulara ilişkin mevcut düzenlemelerin bu Kanuna aykırı olmayan hükümlerinin uygulanmasına devam olunur.

(2) Bu Kanunun yürürlüğe girdiği tarihten önce Müsteşarlık ile teknik işletici arasında yapılan sözleşme, süresi sonuna kadar devam eder.

MADDE 17- (1) Bu Kanun 30/6/2009 tarihinde yürürlüğe girer ve hükümlerini Bakanlar Kurulu yürütür.

APPENDIX B

THE DISASTER POLICY IN TURKEY

BEFORE 1999: EMPHASIS ON CONVENTIONAL DISASTER POLICIES

Natural disaster management in Turkey is organized according to the Disasters Law (No. 7269), which determines major responsibilities of government at both central and local levels. Although the Disasters Law determines the tasks that should be done before and after disasters, it has long emphasised the post-disaster process [1]. Accordingly, Ministry of Public Works and Settlement (MPWS) is responsible for all pre-disaster plans and coordination [2]. Natural hazard threats are determined by MPWS and emergency measures are implemented by local authorities (Article 4 and 6). Departments of MPWS that deal with disasters are: GD of Disaster Affairs, GD of Technical Research and Implementation and GD of Construction. After disasters, MPWS should gather public entities under its authority [3]. At the local level, governorates, i.e. the local units of central government, are responsible for the post-disaster groups (Regulation: 88/12777) such as Province Committee of Rescue and Aid, Province Disaster Bureau, District Rescue and Emergency Committee [4]. Municipalities have also responsibilities at the local level for rescue works and helping victims, if civilian authority instructs. Mayors contribute to province and district aid committees, which are headed by civilian authorities. Besides, metropolitan municipalities are responsible for fire brigades that carry out fire and rescue works.

OTHER CHANGES IN THE DISASTER POLICY AFTER 1999 EARTHQUAKES

Changes toward Risk Mitigation: The Independent National Earthquake Council of 20 scientists has been instituted by the Prime Ministry (Prime Ministry Mandate 2000/9, 21.3.2000), because an authority was considered necessary to make the final assessment of events in relation to earthquakes, and point to the necessary lines of action. Members were identified by universities and related instiutions, each nominating individuals other than their own [5] (Balamir 2001a). The Council has produced a report as 'National Earthquake Strategy' (UDK 2002). However, the Council is abolished in 06.01.2007. Following the 1999 earthquakes, there has been a great concern on earthquake risk, risk mitigation and preparedness issues among indiviuals, governmental, non-governmental and academic organizations. The produced national reports in this period were: The report of the 'National Strategy of the Reduction of Earthquake Losses' that is published by the National Earthquake Council in 2002; the report of the 'Earthquake Management Study Group' in the 4th Economics Conference of Turkey organized by State Planning Organization in 2004; and the reports of the 'Earthquake Convention' organized by the Ministry of Public Works and Resettlement in 2004.

Risk Mitigation Projects: Several earthquake risk mitigation projects are caried out, particularly for Istanbul. In response to the established likelihood of a major earthquake in Istanbul, the Metropolitan Municipality of Istanbul (MMI) cooperated with the Japanese JICA teams in an analysis of hazard probability distribution and the preparation of microzonation maps. The JICA study (and later the Red-Cross study) identified the extent of damages throughout the metropolitan area. Having obtained a 'diagnosis' of the hazard. The following step for the MMI was to obtain a 'prescription' for action to avoid or minimize the impact of the earthquake, which was entitled as the Earthquake Master Plan for Istanbul (EMPI) aimed to identify all possible lines of action for mitigation (Balamir 2004b). The METU-ITU approach in EMPI (2003) rested on an Urban Risk Analysis methodology in which the risks based on natural hazard distribution together with the conceptualizations of Urban Risk-Sectors led to the structuring of a comprehensive line of action, or the Mitigation Plan, which refers to analyses and risk management activities for the metropolitan area. Action Plan refers to local comprehensive rehabilitation projects that cover physical transformation and community regeneration programs. Action Plans are recommended in high risk areas for the transformation and upgrading of such areas in physical and social terms. The studies of Local Action Plan that is suggested in sub regions having high-risk has started in 2003 in Zeytinburnu District named Zeytinburnu Urban Regeneration Project, because Zeytinburnu is the primary risky area according to JICA study and the district has also a high potential for urban transformation. Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP) was proposed by the Turkish government and the World Bank within the framework and conceptual comprehensive approach of the EMPI.

Changes involved with Local Administrations: Following 1999 Earthquakes, responsibilities of local administrations were extended by governmental Decrees to cover disaster mitigation efforts by amendments to existing Laws (Balamir 2001a). Moreover, to overcome implementation problems of current legal system, two new institutions were established in Istanbul in 1999: 1-) Disaster Management Center (Afet Yönetim Merkezi-AYM) and 2-) Disaster Coordination Center (Afet Koordinasyon Merkezi-AKOM). Former depends on State Province, when latter to Istanbul Greater Municipality. While AYM is responsible for post-disaster emergency management, AKOM is responsible for risk reduction before a disaster strikes. In addition, new laws were enacted to restructure central and local administrations recently to increase the tasks and privileges of municipal and special provincial administrations for preparedness, mitigation, intervention and rehabilitation (JICA, 2004). First, the Metropolitan Municipal Governments Law (5216; 10.07.2004) gives the metropolitan municipalities the main responsibility for pre-disaster risk mitigation activities [6]. In addition, the Municipalities Law (5393; 03.07.2005), gave the municipalities power and authority for risk mitigation to implement urban regeneration and development projects [7].

Changes in Post-Disaster Management and Establishment of Disaster and Emergency Management Directorate: Organizational rehabilitation and establishment of new and complementary units was inevitably taken into the agenda of government. The General Directory of Disasters of the Ministry of Public Works and Settlements (MPWS), and the Kandilli Observatory attached to the Prime Ministry. In addition, Directorates of Civil Defense for Rescue and Emergency attached to the Ministry of the Interior (Decree 586 and 596; 27.12.1999 and 28.4.2000). Besides, General Directorate of Emergency Management attached to the Prime Ministry (Decree 583; 22.11.1999). Recently, 'the 'General Directorate of Emergency Management of Turkey' under the Prime Ministry, the 'General Directorate of Disasters' under the MPWS and the 'General Directorate of Civil Defense' under Ministry of Interior are integrated as 'Disaster and Emergency Management Directorate' (DEMD) is established as attached to Prime Ministry (Law No. 6902; 29.05.2009). With this change, three councils are to be constituted as 'Disaster and Emergency High Commision', 'Disaster and Emergency Coordination Council' and 'Earthquake Advisory Council'. DEMD will have five departments as 'Planning and Mitigation Department', 'Earthquake Department', 'Defense Department', 'Intervention (Recovery) Department', 'Rehabilitation Department', and 'Adminisitrative Services Department'. 'Planning and Mitigation Department' is to be responsible for the intervention on natural disasters and emergency through national plans, national risk management and mitigation plans, and developing insurance services. 'Earthquake Department', on th eother hand, is to be dealth with activities before and after earthquakes such as earthquake risk management and mitigation plans, public works, and development plans and projects. 'Rehabilitation Department', on the other hand, is inolved with the post-disaster activities such as public works, development plans and projects, coordination of institutions and monitoring. 'Intervention Department' is to be linked to Disaster and Emergency Management Directorates in provinces, when 'Civil Defense Department' is to be related to Civil Defence Directorates and, when these direcorates will be dependent on Provincial Governors. However, how the departments involved with pre-disaster risk mitigation, post-disaster rehabilitation and earthquakes will be linked to local adminsitrations, i.e. Municipalities, Ministry of Public works and Settlements and the ZDS System is not obivous yet.

NEED TO INTEGRATE RISK MITIGATION INTO DEVELOPMENT LAW

Changes in the Development Law, introduction of contemporary tools and establishment of a functional administration remain central to efforts for in mitigation and risk management. Moreover, although mitigation projects were developed after 1999 earthquakes such as EMPI, MEER and ISMEP, only EMPI and Zeytinburnu Urban Regeneration Project emphasized pre-disaster urban risk reduction in a comprehensive manner. ISMEP does not take into account international and national experiences (Balamir 2006:7). The country insist on emphasizing post-disaster activities. Concepts and measures of urban safety, as well as new and extended tools of land use and property management need to be incorporated into the law and entrusted to local administration. Essential changes for revitalized land-use planning are likely to cover the following issues: Microzonation, area classification and zoning, urban risk analysis and contingency plans, participatory local governance, surveys of building stock and supervision of planning and construction, action plan areas, general rehabilitation areas, risk assessment and disclosure, development rights exchange or transfer, and obligations of keeping city database. Other required regulations for risk management in land use and construction can be described as principles of microzonation, urban risk analysis and preparation of contingency plans, action plans and programs for high-risk areas, standards in building performance, mechanical equipment, and furnishing, and safety in urban exteriors. These could be identified as regulations to be included in the Development Law (Balamir 2005).

APPENDIX C

THE NEW INTERNATIONAL POLICY OF DISASTER REDUCTION

THE THERMINOLOGY OF THE NEW INTERNATIONAL POLICY

Natural disaster risk: The product of *hazard* and *vulnerability* (Risk = Hazard x Vulnerability) that can cause losses as a result of the interaction of '*extreme natural event'* with '*vulnerable human settlements'* (Blaikie et al. 1994: 9; Smith 1996:25-6; Pelling 2003: 5).

Risk: The combination of probability and loss. The statistical analysis of risk is based on theories of probability, which calculate risk (R) as a product of probability (p) and loss (L): R=p×L (Smith 1996:38).

Natural hazard: Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UN/ISDR 2009).

Hazard: A general source of danger, which can occur naturally or by human-induced processes or events (Smith 1996:5).

Vulnerability: Being prone or susceptible to damage or injury, when vulnerability of human settlements to natural hazards means a set of conditions and processes resulting from physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards (UN/ISDR 2009).

Physical vulnerability addresses the susceptibilities of location and the built environment as exposure, placed in harm's way and unsuitable design or materials used in construction.

Environmental vulnerability depends on the extent of natural resource depletion and the state of resource degradation.

Social vulnerability is linked to the level of wellbeing of individuals, communities and society, when some groups are more vulnerable than others. This difference arises from social factors such as literacy, education, access to human rights and social equity, etc and depends on the political factors such as social power relations, institutional organizations governance structures.

Economic vulnerability: Economic status of individuals, communities and nations causes the differences in the vulnerability levels, when economic vulnerability usually depends on the economic reserves, access to credit, loans and insurance (UN/ISDR 2004).

Resilience refers to "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions" (UN/ISDR 2009).

Need to Include Hazard Mitigation into Urban Planning

The procedural steps of urban planning to be integrated into the steps of mitigation include: 1) generating planning intelligence; 2) setting goals and objective; 3) adopting policies and programs; 4) monitoring, evaluation, and revision. Risk identification and analysis steps of hazard mitigation can be integrated into the first step of urban planning, i.e. intelligence, that includes land-use projections, hazard assesment and capability analysis (Godschalk et al. 1998), because land-use planning is the means for gathering and analyzing information about the suitability for development of land exposed to natural hazards (Burby et al. 2000). Then, the first fundamental choice is whether the mitigation plan will be a stand-alone plan focusing on hazards or will be a part of a comprehensive community plan (Godschalk et al. 1998). In this step, land-use plans state community goals, principles, and actions (Burby et al. 2000) that gives the community the opportunity to consider community issues in a systematic and comprehensive manner. Accordingly, hazard and vulnerability reduction/ mitigation, environmental quality and population accommodations may exist among the goals of a land use plan, along with other community goals such as coordinating future growth with infrastructure capacity or protecting fragile natural resources (Godschalk et al. 1998). Next, the plan is involved with growth management and may choose to focus on future development or on existing development or both, depending on the relationships between hazards and urban land use patterns (Godschalk et al. 1998). At the last step, performance of the land-use plans and programs has to be monitored and evaluated from the aspect of mitigation effectiveness and impact measurement (Godschalk et al. 1998).

1) Production of Urban Risk Maps: An urban risk map can be described as a map of potential losses through zoning the urban area according to risk levels. Urban risk map provides information about the potential areas that are exposed to multiple hazards; the areas with the potential loss of lives and properties; and the areas with potential loss of investments and infrastructure. Urban risk map includes also information about the risk reasons to provide a guideline for policy implementation. Urban risk maps are obtained through the implementation of certain techniques at different scales and at different steps as the identification of hazards and vulnerabilities, preparation of integrated hazard map and micro-zonation map and the identification and analysis of urban deficiencies. Urban risk maps can be generated by local administrations (Balamir 2005).

2) Including Risk Reduction Policy Instruments into Urban Plans: In new development areas, planning programs reduce potential losses by steering urban expansion or development to the least hazardous parts of building sites (hazard avoidance) and by modifying building and site design practices (risk minimization) (Burby 1999). The measures to restrict development of hazardous areas in urban plans can be as: 1) prohibition of development in high-hazard areas and 2) low density zoning to limit the number of dwelling units that can be built in hazardous areas (Burby and Dalton 1994). Local governments can use a wide variety of development plan tools that can help mitigate natural hazards such as building standards, development regulations, critical and public facilities policies, land and property acquisition, taxation and fiscal policies, and information dissemination (Olchansky and Kartez 1998; Burby et al. 2000). For existing/past development located in hazardous areas, planning programs can help property owners relocate their homes and commercial buildings to hazard-free sites, or to modify them to reduce the risk of loss (Burby 1999). Focus on existing vulnerable settlements necessitates requirements or incentives for retrofitting, or acquisition of property at risk and relocation of residents and businesses (Godschalk et al. 1998). The measures in urban plans can be 1) density bonuses to compensate developers with increased density outside of hazard areas in return for reduced density in areas subject to natural hazards; 2) reduced property taxes for parcels located in hazardous areas that developers have dedicated to open space uses; and 3) transfer of development rights, a procedure that allows landowners to recoup financial losses from density reductions in hazardous areas by selling rights to build at higher densities than normally allowed hazard-free areas (Burby and Dalton 1994).

3) Monitoring the Urban Plans, Programs and Construction Practices: The integration of hazard mitigation or safety elements into urban plans can confront difficulties such as the low staff capacity and commitments of planners in local administrations and demand for land in hazardous area. In addition, construction of new infrastructure and transportation systems and mitigation of risk in the existing ones are involved with the public investments as an issue of urban growth or economic development. There is a need to evaluate the plans and monitor their implementation as well as construction practices, which can encourage the mitigation efforts of local communities as well as collective risk reduction. Local administrations can be provided with incentives or mandates to implement certain risk reduction policies or to make hazard mitigation plans. The experience of USA with mandates to add safety elements shows that local administrations are not likely to adopt hazard

mitigation plans without upper level administrative mandates that are actively monitored and enforced (Burby and Dalton 1994).

Enhancing Socio-Spatial Capacities

Local authorities have an essential role in improving conditions of human settlements to reduce natural disaster risk, because of their direct contacts with local people and their responsibility for the application of national policies and implementation of infrastructure and development projects. Local authorities can also upgrade the infrastructure and improve building construction, production of building materials and construction methods. Competing for national resources by local authorities can influence the national policies and the distribution of resources. The power of local authorities arises from their role in turning policies into actions for mitigation. Local policies, planning and regulations can be effective in guiding the interaction between the human and natural environment, in community development and in providing legislative support in terms of regulations and standards, as well as facilitating access to resources (El-Masri and Tipple 2002).

1) Direction of Resources into Risk Mitigation: The success of risk mitigation policies requires substantial financial resources, particularly in developing countries due to the high risks. The new international policy emphasizes that disaster risk reduction has a higher priority within bilateral and multilateral donor policy and international financial institutions. Both pre- and post-disaster processes need to invest in disaster risk reduction as complementary and considering other sectors such as education, health, agriculture, urban management, employment, transport, infrastructure, among others' (UNISDR 2004). With respect to the values of sustainability, the financial resources has to be structured out of continous, even if modest flows of sustainable income (as in the case of partial property taxation), and are likely to be monitored more objectively and efficiently. Special-purpose funds can be structured and entrusted at the discretion of lower-echelon technical committees, or communities, even if of smaller sizes, are often more efficiently and extensively used. In this case, it may for instance more often be possible to allow local authorities or communities with competing projects apply for funds reserved for mitigation purposes (Balamir 2001b). Indeed, risk mitigation funds can be constituted for these purposes as observed in USA. The Hazard Mitigation Grant Program (HMGP) and The Disaster Mitigation Act (DMA 2000). HMGP assists States and communities to implement long-term hazard mitigation measures for all hazard types. HMGP provides fund for the mitigation measures like acquisition or relocation of flood-prone structures, elevation of flood-prone structures, seismic rehabilitation of existing structures, and strengthening of existing structures against wildfire. The applicant is responsible to carry out the project. The Disaster Mitigation Act (DMA) authorizes the creation of a pre-disaster mitigation program to make grants to State, local and tribal governments (NFIP 2002).

2) Designing Risk Mitigation and Hazard Insurance Strategies: Sustainability framework of new international policy requires involvement of NDRM with social context and addresses the distribution of responsibilities in an organized manner to constitute social solidarity. Describing individual responsibilities requires the consideration of different stakeholders in the society and the relationships among them. These include different levels of institutional authorities (international, national, provincial and local) and households, businesses/industries, banks, insurers, news media, etc. Implementing sustainable NDRM strategies requires to provide collective risk reduction, because the escalating hazard vulnerability is the result of individual and collective decision making. Thus, institutional authorities, particularly local administrations has to be involved with other stakeholders in the society. The capitalist societies encompasses different type of stakeholders that are involved with pre-disaster risk mitigation process as businesses, households, economic influentials, social influentials, legal influentials, and hazards professionals (Lindell et al. 1997).

3) Collective Risk Reduction with Households: To provide collective risk reduction, households can be made proactive in taking mitigation measures (Burby et al. 1998; Kunreuther and Roth 1998; Tierney et al. 2001). Households are involved with the primary living unit, when their risk reduction behavior does not only influence their individual vulnerability, but also the collective or community vulnerability in aggregate, because they control substantial amount of social assets, i.e. buildings and contents. Households can choose to live in more and less hazard prone locations as well as to engage in pre-disaster adjustments/ measures to limit their vulnerability to disasters (Lindell et al. 1997). These adjustments include: (1) hazard mitigation measures (e.g. structural measures such as retrofitting the foundation, strenghtening walls, strapping the water heater, tall and heavy furniture to walls), (2) emergency preparedness measures (e.g. establishing supplies of bottled water and canned food, fire extinguisher and making emergency plans) and (3) ex-ante financial measures (e.g. informal or formal such as purchase of hazard insurance), which can also be called as recovery preparedness measure (Lindell and Perry 2000). On one hand, households are required to be linked to the local administrations in

targeting and implementing mitigation measures because of the need for technical support as well as the constraints arising from individual decisions. On the other hand, the activities of local authorities should be broadened by increased public participation in terms of policies and strategies (El-Masri and Tipple 2002).

4) Stakeholder Approach and Social-Power Relations: The stakeholder approach provides to design the suitable strategy according to the problematic factors in the perception and behavior of the households through establishing suitable power and role relations. This approach describes the gatekeepers, i.e. urban managers, planners, emergency managers as well as programs or policies, as empowered to carry out tasks in the socio-political context. They are set between micro and macro levels and influence individuals, society and environment in terms of their societal roles or systems (Palm 1990). The strategies or policies involved with risk reduction and insurance that are directed to households act as gatekeepers or stakeholders constrain or enable households' decision process and behavior through societal rules and provision of information. From this approach, the strategies - to influence the perception and behavior of the households directly and indirectly- can be envisaged through finding out the suitable power and role relations (Arlikatti 2006). According to Lindell et al. (1997), the influence of stakeholders on each other can be viewed in terms of social power relationships that is conceptualized by French and Raven (1959; Raven 1965 cited in Arlikatti 2006) as six bases of power: reward, coercive, legitimate, expert, referent and information power. These power relationships can be constructed among institutions and between other stakeholders. Power operates in the upward (from household to local to state) and downward direction as well as vertical (between different levels of institutions/ governments) and horizontally (between private and public sectors as well as among agencies in a community). Reward and coercive power are based on the regulatory approach and requires continuing surveillance in order to assure rewards are provided only for compliance and punishment is certain to follow noncompliance. Legitimate power can be defined in terms of rights and responsibilities associated with each role in a social network. Referent power addresses the trustworthiness of different stakeholders. Expert and information power addresses the perception of other stakeholders' knowledge and guide risk communication strategies (Arlikatti 2006).

APPENDIX D

THE WORLD RISK SOCIETY

According to Ulrich Beck, the side effects of human progress that are confronted by the contemporary society encompasses qualitatitively new risks such as: *environmental risks* (e.g. environmental degradation, global warming and climate change); and *technological* risks (e.g. chemical, biological and nuclear risks) (Beck 1992b:20-21; Beck 1996:31) as well as *socio-economic* risks (e.g. unemployment, underemployment and low wages). The reason of the distinguishable socio-economic and physical impacts in global, national and local scales of new risks underlies in their changing characteristic as becoming more dependent on human decisions about environment and technology (Beck 1992a:98). Thus, these risks are called as 'manufactured uncertainties', because they are produced and legitimated by the central institutions of modernity, i.e. government, industry and science, negative-and/or dark side effects of industrialization during the production of goods. "[T]he social production of wealth is systematically accompanied by the social production of risks". (Beck 1992b:19). However, the existing rules of causality, blame and liability are not sufficient to account them and nobody is responsible for them (Beck 1996:31). Although risk, responsibility, trust and security are connected to each-other, the responsibility and costs cannot be attributed to someone due to the 'organized irresponsibility' (Beck 1999/2000: 7). Although the threats in pre-industrial society were incalculable (plague, famine, nattural catastrophes, wars, but also magic, gods, demons), the industrial society was a 'society of calculable risks', where the risks were statistically 'calculable' due to instrumental rational control of modernization. In risk society, these risks are statistically infrequent and there is little previous experience to to calculate, prevent and avoid them with the existing rules and mechanisms of industrial society (Beck 1996: 30-31).

Beck et al. (1994:6) claim that self-confrontation with new risks and limits of existing mechanisms make the contemporary society self-critical and reflexive. The society moves into a new phase of second modernity that is not beyond the realm of modern (as opposite to postmodern discourse), but toward a second stage of modernization, while industrial society disappears (Beck and Lau 2005). Beck (1996:31) advocates that this transition toward 'reflexive modernization' is an involuntary mutuation through systematically produced hazards. In this transformation, risk society is "a society increasingly preoccupied with the future (and also with safety), which generates the notion of risk" (Giddens 1998:26). Risk is defined in risk society -'a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself'' (Beck 1992b:20). Risks and their management become the central issue of global society, where new definitions of responsibility, hazard, security and control are defined to deal with new risks as well as to include all people in a cosmopolitan way (Beck et al. 1994). Reflexive modernization is not only involved with a structural change, but with a dynamic relationship between social structures and social agents (Beck 1992a: 95). Therefore, reversing the social construction of risk, i.e. production, legitimization and distribution, new mechanisms of risk management are to manufacture securities through calculating and managing (prevent and avoid) these risks in an organized responsibility context, where the responsibility of managing these socially produced risks belongs to society/public responsibility in cosmopolitan way of solidarity.

APPENDIX E

ASSESSMENT OF FACTORS INFLUENCING HOUSEHOLDS' DECISION PROCESS FOR TAKING RMMS AND PURCHASING HAZARD INSURANCE

Decision making process of "households" for taking risk mitigation measures and purchasing hazard insurance is discussed in a variety of scientific disciplines in the literature. In this section, these varying approaches are reviewed to develop suitable risk mitigation and insurance policies through assessing households' decison process.

ECONOMIC THEORY OF DECISION UNDER RISK AND 'ATTITUDES TOWARD RISK'

In 1947, von Neumann and Morgenstern developed 'expected utility model' (EUT) under under uncertainty. They showed that if an individual's preferences among gambles satisfied certain basic axioms of rational behaviour, then utilities could be outcomes in such a way that individual's try to maximize their preferences through utility function, or in other words, their expected utility (Kunreuther ans Slovic 1978). According to EUT if individuals' are acting rationally they would choose a level of risk in which the marginal expected benefits are equal to marginal expected costs. Expected costs and benefits are measures according to the probability of events. The probability is either based on expert judgment (objective probability) or individuals' perceptions (subjective probability) (Asgary 2003). In 1954, Savage generalized the theory to allow the probabilities to be subjective or personal (Kunreuther and Slovic 1978). Savage's innovation was an introductory point to psychological intervention in the utility theory. Using subjective probabilities instead of expert judgment required measuring of subjective probability and therefore risk perception. Subjective expected utility theory (SEUT) is a normative theory and has the same basis and axioms as EUT, this theory provides a set of rules for combining beliefs (probabilities) and preferences (utilities). Individuals assess probabilities and their assessments are based on the information, experience, etc (Asgary 2003).

The shape of the utility functions reveals information about people's attitudes concerning the spread of possible outcomes of their action around the action's expected value. When the extend of such a spread measures the risk, the attitudes of people toward such a spread reveal their attitudes toward risk. People can view risk in one of three ways. They can be averse, neutral to it or seek it out (Kohler 1982). Risk attitude, a person's standing on the continuum from risk aversion to risk seeking, is commonly considered to be a personality trait (Weber et al. 2002). A risk-averse person is a rational person that chooses the less risky or risk-less alternative and wants to pay for insurance to avoid the risky situation, when the insurance companies shows a risk neutral behavior (Friedman and Savage 1948). Risk averse households are expected to be willing to pay for insurance against the loss of their most valuable asset their home. Moreover, the risk-averter is assumed to over insure, when the actuarially rate is fair, and partially insure, when the rates are unfavourably.

There are criticisms of rational choice from "bounded rationality" (Simon 1955) and "prospect theory" (Kahneman and Tversky 1979). Bounded rationality model assumes that decision maker has cognitive limitations to deal with relatively little information and relatively few concepts (Kunreuther and Slovic 1978; Mileti 1999). Bounded rationality model find out several limitations in the adjustment to natural hazards: limited range of alternatives, misperception of risks and denial of uncertainty, crisis orientation, and individual versus collective management (Slovic et al. 2000). Prospect theory (PT) (Kahneman and Tversky 1979) emerged as behavioral decision theory in the field of psychology. PT assumes that individuals are loss averse and generally irrational in their decision making under uncertainty and complexity. PT indicates that decision makers prefer to simplify their choices cognitively whenever possible, satisfying rather than maximizing. In the natural disaster field, PT (Kahneman et al. 1982) showed that people (under uncertainty) tend to reduce and simplify or mis-processing information respond to probabilistic information by using a limited number of rules of thumbs or heuristics as *over-weighing*

the low probabilities, certainty, framing, media attention, familiarity and availability, *representativeness* and *anchoring.*

Further research in behavioral economics revealed that individuals tend to make different trade-offs between the probability of the event or its likely outcomes depending on the context of the problem and the means used to communicate the information. In addition to the biases explained by the prospect theory, with the findings in the low probability high consequence events like natural hazard studies (Kunreuther et al. 2004) found out that people may not adopt protective measures, due to certain factors as *myopic behavior and time insensistiviy, short time horizons, high discount rates, aversion of upfront costs, truncated loss distribution (e.g. expected government relief), role of friends and neighbours, role of emotions and affect*.

HAZARD / TECHNICAL APPROACH AND RISK PERCEPTION

Adapting the human ecology approach into environmental hazards, geographers (White, Burton and Kates) in USA accepted natural hazards as linked to the individual decisions to settle and develop hazard prone land (Smith 2004). They conceptualized disasters as events caused by physical hazard agents and human behavior as responses to the impacts. They dealt with both environmental and behavioral aspects of disasters through hazard-based and agent-specific approach. This apprach has a technical perspective, which advocates that technical, i.e. engineering, solutions can modify hazards to prevent the impact of periodic flooding to human (Tobin and Montz 1997). That is, the solution to prevent disaster impacts was sought in applied science and technology through the 'technical fix' methodology (Smith 2004). This approach led the emergence of a technical approach in other scientific disciplines. The technical focus of geographers also lead to be involved in risk-related research and documentation of hazard probabilities and impacts [8], when they mostly involved with mitigation programmes through human adjustments (Smith 2004: 5). Occupancy of hazardous locations are attempted to be reduced in terms of education, warning programs and legislation such as hazard zoning (Liverman 2001). This approach led to the establishment of centralized organizations, because only government-backed bodies possessed the financial resources and technical expertise (Smith 2004:7).

To understand the interaction of human and natural hazard, White focused on hazard impacts, vulnerability and adjustment mechanism with the emphasis on *human behavior*, *perception and choices,* particularly in flood hazards in the United States (Liverman 2001; Hinshaw 2006). The studies of hazard researchers are based on *behavioral theories* of decisions and *bounded rationality*. Accordingly, individuals make decisions based on limited knowledge about risks within the constraints of a social system (Burton *et al.* 1993; Liverman 2001: 4656). Although natural hazard field is diversified in time, current hazard research continues to interest in human choices based on 'bounded rationality' model. Saarinen (1966) and Kates (1962) showed that adjustments to hazards are influenced by *socio-economic* and *personality* characteristics of individuals as well as by their *knowledge* and *experience* (cited in Liverman 2001: 4656). They also recognized that 'both knowledge about potential adjustments and the ability to carry out such measures are social structures' (Tierney 2006: 111). Researchers like Lindell (1994), Slovic (1986) and Stoffle *et al.* (1991) used hazard information, bounded rationality and risk perception issues as the prominent features of hazard awareness and warning response studies [9] (Bolin an Stanford 1998: 30). The studies involved with households' decision process and behavior searched the influence of earthquake related variables, i.e. risk perception through hazard awareness, previous earthquake experience, length of residence, perceptions about the likelihood of earthquakes, perceptions about vulnerability to earthquakes, degree of damage experienced or witnessed from earthquakes, and information seeking regarding preparedness (Russell et al 1995).

Risk perception is the subjective assessment (intuitive judgment) of both the 'probability of occurrence' of a specified type of accident and the severity of the 'associated consequences' (i.e. how concerned we are with the consequences) (Oltedal et al. 2004; Sjöberg et al. 2004). Risk perception is measured in terms of "the perceived outcome" (i.e. consequences or severity or vulnerability) and "the perceived likelihood" (i.e. probability) that this outcome will occur. Lindell and Perry (2000) summarizes the measures of risk perception used in the seismic adjustment adoption research as in a number of different ways as (1) free-response method (Jackson 1977, 1981), (2) global risk perception (Jackson and Mukerjee 1974; Dooley et al. 1992), and (3) specific risk perception.

Specific risk perceptions are measured in terms of (a) earthquake event characteristics such as the probability, severity (Mulilis and Lippa, 1990) and imminence (Mulilis and Duval 1995) as well as in terms of (b) personal consequences such as the probability and cost of property damage (Kunreuther et al. 1978; Palm et al.

1990) or death/ injury, property loss, interference with work, and social disruption (Showalter 1993). According to these research, there is found general significant correlation between risk perception, seismic adjustment (Lindell and Perry 2000) and insurance purchase (Kunreuther and Slovic 1978; Schwarze and Wagner 2007). When risk perception is theoretically linked to hazard awareness, personalization of risk and personal experience, these are usually related to each other (Lindell and Perry 2000) and to location/proximity to fault (or living near to hazardous areas) (Palm and Hodgson 1992b), and resulted in the adoption of seismic adjustments.

Perceived probability and damage: Adoption behavior was predicted by the greater perception of earthquake probability in a study of Parkfield community, while the estimated damage by respondents was found as correlated the number of adopted seismic adjustments (De Man and Simpson 1987). In addition, the survey before and after the Browning forecast, residents were more concerned about the property damage and loss of services than they are concerned with death, injury, and income loss (Showalter 1993). In contrast, adjustment adoption was found unrelated to expectation of future earthquake losses in the survey of Jackson (1977; 1981). On the other hand, insurance purchase was found as associated with the perceived likelihood and expected property damage from a severe event (Kunreuther et al. 1978; Palm et al. 1990), while the threats of death and injury had no significant effect on the insurance purchase but on all other protective measures (Showalter 1993). The reason can be the expectation of insurance purchase is involved with the threats to property damage (Lindell and Perry 2000). Palm and Hodgson (1992b) found also a consistent relationship that was reported between the belief of personal vulnerability and the adoption of earthquake insurance.

Hazard Awareness and Risk Personalization

Hazard awareness: If individuals are aware of the hazard and the hazard is salient to them, they translate hazard awareness into a belief that their own lives and property are vulnerable (the perception/ belief of personal vulnerability) and therefore, they are motivated to take the necessary precautions. In fact, the 'adverse selection' assumption of insurance theory suggests that only those susceptible to the hazard purchase insurance. However, the adverse selection may not exist due to the lack of awareness of the location of the risk (Palm and Hodgson 1992b).

Personalization: Lack of personalization - despite being aware- results in the failure of adoption behavior (Lindell and Perry 2000). Findings showed that risk area residents can fail to personalize the risk and then fail to adopt these measures. For instance, Jackson and Mukerjee (1974) found that lack of personalization of the risk causes respondents to expect global effects to city but slight or no damage to themselves. Similarly, Turner et al. (1986) reported that personalization of risk is failed among risk area residents and their hazard awareness fluctuates in time. Dooley et al. (1992) reported consistent findings in a longitudinal data that explains residents' concern increases after they experience earthquake immediately, but decreases by the time. On the other hand, Mileti and Fitzparick (1993) noted that 80% of respondents expect an earthquake, when only one third expect harm to thelselves, their families and property.

Optimistic bias (unrealistic optimism): It is described as the tendency of people to estimate that their own chances of experiencing harmful events are less important than the chances of other people, can hinder efforts to promote risk-reducing behaviors (Weinstein 1989). If the fail of risk personalization is measured in terms of time factor, Mileti and Darlington (1995) found that people were optimistic about their personal loss although they expect an earthquake in the next years. In contrast, there are also studies that found non-significant correlations between the high level of concern and adoption behavior (Russell et al. 1995; Mileti and Darlington 1995). According to Palm and Carrol (1998), empirical findings from surveys of Japanese and California homeowners also showed that Californians tended to be overly optimistic, to believe their own neighborhoods were safer and better prepared for earthquakes than other areas in their city or region, while Japanese believed their own areas were more at risk and less well prepared (cited in Kunreuther and Roth 1998).

Global risk perceptions (earthquake concern, having trouble, fear/worry/anxiety): Dooley et al. (1992) found also that earthquake concern and preparation as consistent and fear-inducing experience as an increasing factor in expressing the level of concern. In addition, they found that unprepared people deny their concern, when concern is positively related to both self-reported and objective earthquake experience. Another finding was that high level of concern increases "preparation (positive association), whereas preparation leads subsequently to decreased concern (negative association)." However, although significant, there is a relatively small total effect on amount of preparation of such predictors such as earthquake experience, general anxiety, and even earthquake concern. An active measuring survey by Mulilis and Lippa (1990) revealed that negative threat-inducing communications increased earthquake preparedness. Although earthquake concern was found

as associated with preparation, the level of concern in the same risk area differs among homeowners. Prior studies identified subgroups who are less or more likey to prepare against earthquakes based on the several personal characteristics involved with concern and preparation. “Perceived probability of earthquake was found positively associated with education (De Man and Simpson-Housely 1987), and length of residence (De Man and Simpson-Houseley 1988). Turner et al. (1986) found people with moderate concern was prepared more than others. Dooley et al. (1992) found that gender, age, experience, ethnicity and general anxiety is associated directly with earthquake concern, when earthquake concern is associated with preparadness behavior. However, education, years resided at the present address, and marital status influence preparation directly. Women and non-anglos expresses their concern more than men and anglos, when earthquake concern decreased about 20% with each years of age.

SOCIAL VULNERABILITY: SOCIAL, DEMOGRAPHIC AND ECONOMIC FACTORS

The vulnerability analysis can be described as ‘socio-political ecology’ perspective and differs from Marxist and post-structuralist approaches. Vulnerability science explores disaster vulnerability ‘as a function of both physical place and social conditions that expose some social groups to the potential for greater harm and that limit their ability to cope when disasters strike.’ Accordingly, vulnerability and resilience of people differ depending on the social factors, particularly their position in the stratification system. Thus, power and resources are not distributed equally, when access to power differs according to gender, racial, and ethnic stratification and economic inequality. Any program or planning effort for loss reduction and recovery must consider the diverse patterns of vulnerability and resilience (Tierney et al. 2001; Tierney 2006). Social vulnerability perspective provides a critical focus on understanding the nature of social systems and processes that generate vulnerability (Peacock 2003). Since each household take decisions in a social context, the society constraints and/or enables individual/household acitivities through political-economy. Households are linked to the society (social structure) in terms of their social positions in a class structure, which is determined by the political economy and influential in their access to power and resources (Palm 1990). Therefore, social and economic factors influence the vulnerability of individuals and households as consequences of socio-economic inequalities. Different levels of vulnerability can be understod through social class, income, wealth, race and ethnicity (Blaike et al. 1994; Peacock et al. 1998; Bolin and Stanford 1998; Mileti 1999).

Recently, the studies that developed techniques and methods of spatial social science quantitative database) contributed to vulnerability science by creating spatial place-based social vulnerability indices of different groups. However, relating the knowledge of social inequality into disaster vulnerability is criticized as being insufficient to explain the causes and processes in which vulnerability is shaped (Cutter 2001 citedn in Tierney et al. 2001). On the other hand, social vulnerability factors have already been understood within the literature under the rubric of demographic and socio-economic factors. A large number of studies included socio-economic and demographic variables into their analysis (Peacock 2003). These factors are essential for several reasons. First, these factors can be used to identify and target the populations that are most likely to adopt these adjustments (Lindell and Prater 2000) or that fail to adopt appropriate mitigation measures. Therefore, education and mitigation programs can be developed for targeted populations (Peacock 2003).The socio-economic and demographic characteristics of the household that are correlated with the seismic adjustment adaoption were found as gender, ethnicity, age, education level, income, occupation, place of residence, and presence of children in household. From the ‘insurance’ point of view, it is important to identify the relationship between income, age, net-equity and insurance purchase, because insurance purchase may differ according to the economic and demographic characteristics of households. If low income and house-rich households are uninsured, they are vulnerable to loosing their homes and their major source of household wealth. However, earthquake insurance purchase is found unrelated to socio-economic characteristics in some studies, which implies that vulnerability to uninsured losses is widespread throughout the population regardless of income or age. In this case, any plan can subsidize or mandate earthquake insurance will affect all segments of the population (Palm and Hodgson 1992).

Age: Younger people are found more likely to believe the forecasts and behavioral response to the forecasts than older people (Turner et al. 1987 cited in Farley et al. 1993). According to Turner et al. (1986) both young and elderly people are least likely to take recommended precautions, while middle-aged people were most likely to adopt household preparedness measures (Edwards 1993). Schiff (1977) argued that older homeowners might tend to be more risk-averse and therefore more likely to purchase insurance because of their cumulative knowledge about proper adjustment to hazards and their usually fixed incomes, which leads them also to have relatively high home equity (Palm and Hodgson 1992). However, Palm and Hodgson (1992) found that age of

household head did not distinguish between insured and uninsured homeowners except in Contra Costa County, where older homeowners were more likely to purchase insurance. According to Russell et al. (1995), survival preparedness and preparedness planning was predicted by being younger only after Loma Prieta Earthquake. Level of seismic adjustment was found siginificantly associated with age (Dooley et al. 1992).

Income Level: Turner et al. (1986) and Edwards (1993) found that higher income and more financial resources to invest in home safety increases the likelihood of engaging in preparedness activities. Income was found also by Russell et al. (1995) as a predictor variable in taking survival preparedness measures, preparedness planning including insurance and hazard mitigation measures before Whittier Narrows Earthquake. After this earthquake, however, income predicted only preparedness planning including insurance. on the other hand, income predicted only hazard mitigation before Loma Prieta Earthquake, when it predicted no preparedness measure after this earthquake. Previous natural hazards research has addressed that those with more to lose – with relatively higher net equity in the property and with more dicretionary income to spend on insurance – as well as those with a shorter earning future (i.e. elderly) are more likely to purchase insurance (Anderson and Weindrobe 1981; and Schiff 1977 cited in Palm and Hodgson 1992). Kunreuther et al. (1978) claimed that income level may be related with insurance purchase. However, if house-rich and income poor may not afford insurance premiums, the direct relationship between net equity and insurance purchase could be modified by income level (Palm and Hodgson 1992). However, Palm and Hodgson (1992) found that home equity position generally does not differentiate between insured and uninsured households. Lindell and Perry (2000) commented on the inconsistent findings with respect to income as the result of considering a relatively different and large number of investment mitigation actions, i.e. getting a flashlight and batteries or attending meetings in hazards adjustment indices (Peacock 2003).

Education: Education influenced both belief in the earthquake forecast and behavioral response to it. People with higher education were less likely to believe the forecast, but more likely to prepare against earthquake (Farley et al. 1993). Although Mileti and Darlington (1997) reported that education was negatively related to adjustment adoption after the dissemination of a hazard awareness brochure, they noted that education was indeed positively correlated with adjustment adoption, because more highly educated respondents already had adopted many adjustments before receiving the brochures (Lindell and Perry 2000). Higher education increases the likelihood of engaging in preparedness activities, while lower education can cause homeowners to be limited with their abilities to understand complex nature of information about earthquakes and preparedness (Turner et al. 1986; Edwards 1993). Being more educated was predictor of only preparedness planning including insurance before Loma Prieta and Whittier Narrows Earthquakes (Russell et al. 1995). Dooley et al. (1992) found that education influences preparation directly.

Household Structure

Gender and Marital Status: Being female and married was found as a predictor of taking survival preparedness measures before and after Loma Prieta Earthquake (1989), while these factors predicted preparedness planning after this earthquake and did not predicted hazard mitigation behavior. Similarly, these factors predicted only preparedness planning and only after Whittier Narrows Earthquake (1987). (Russell et al. 1995). On the other hand, in another survey in California by Dooley et al (1992), level of seismic adjustment was found siginificantly associated with marital status and having family members (motivational factors), while living without a partner was one reason of being unprepared. In addition, there is no study that investigated gender and insurance purchase relationship (Palm and Hodgson 1992).

Presence of Children in the Household: Presence of children in the home was found associated with the level of seismic adjustment (Dooley et al. 1992) and preparedness activities (Edwards 1993), when number of children in home predicted the preparedness planning before Whittier Narrows Earthquake, but hazard mitigation after this earthquake (Russell et al. 1995). Edwards (1993) explains the importance of this variable in terms of two reasons. First, adults may be more attentive to the safety of their children than they are to their own safety. They may take precautions to protect their children that they would not otherwise invest in for themselves. Second, children are likely to bring safety information from school into the household that might not otherwise be familiar to adults. Children can act as a motivational tool for adults, making preparedness a fmaily event (Edwards 1993). Similarly, Turner et al. (1986) reported that school-age children in home is correlated with community bondedness that is associated with a milti-item index of sesimic adjustments (Lindell and Perry 2000).

Neighbourhood Tenure and Homeownership: Level of seismic adjustment was found siginificantly associated with neighbourhood tenure (Dooley et al. 1992). Russell et al. (1995) found that survival preparedness and

preparedness planning including insurance was correlated with homeownership before earthquakes, when the number of years in the neighbourhood was correlated with the hazard mitigation before earthquakes.

Community bondedness and Responsibility: Turner et al. (1986) suggested that a predictive construct reflected by variables such as presence of school-aged children in the household, marital status, home-ownership, and length of residence in a neighbourhood may represent community bondedness or involvement. Community bondedness may represent a sense of investment in a lifestyle and geographic place, as well as access to a social network with similar interests in preparing for survival in a disaster. On the other hand, having school-aged children in the household, being married, owning one's home, and having longer residential tenure may characterize individuals with a capacity and willingness to take responsibility for themselves and their families. That is, willingness to take responsibility for oneself and others and community bondedness are likely to be overlapping constructs (Russell et al. 1995). Dooley et al (1992) found that years resided at the present address influences preparation directly.

Ethnicity and Immigrant Status: When Edwards (1993) found seismic adoption behavior as positively correlated with white ethnicty, Bourque et al. (1997) found also correlation between immigrant status and adoption behavior.

SOCIO-CULTURAL VALUES AND BELIEFS

Social Construction Perspective

Cultural theory of Douglas and Wildawsky (1982) provides a socio-cultural perspective to assess values, beliefs and perceived roles and responsibilities. Douglas and Wildawsky (1982) described views on risk as a cultural phenomena that reflect societal and group values, which must be interpreted in their broader cultural functions (Tierney 1999: 218). This cultural theory of risk gained attention from technical-scientific studies in risk perception and risk management (Lupton 1999a:16). Culture is embedded in a person's way of life, which is defined by the strength of the grid-group characteristics of their social relations (Oltedal et al. 2004). Group refers to the extent to which an individual is incorporated into bounded (social) units (Marris et al. 1998). Grid refers to what degree a social context is regulated and restrictive in regard to individuals' behavior. When interaction between grid and group changes, this may influence peoples' social participation. The grid-group analysis describes different modes of social control (Oltedal et al. 2004). The degree of group and grid determines the nature of response to risk. High-grid and high-group refer to hierarchical nature and place high trust in institutions. Low-group and low-grid addresses individualistic nature and prefer self regulatory approaches to risk. This model is a functional structuralist analysis of the cultural response to risk. It provides going beyond individual and psychological and cognitive response to risk. People are assumed that they make their risk judgments on a socio-cultural context (Lupton 1999b:3). This cultural perspective of risk tends to closer towards the relativists; however, all risks are treated as real, when Douglas attempted to explain the way of their politicization (Douglas 1992: 29 cited in Lupton 1999b:5-6).

Accordingly, adherence to specific patterns of social relationships generates distinctive ways of looking at the world, which is referred as cultural biases. This adherence to a particular world view legitimizes a corresponding type of social relations (Marris et al. 1998). These world-views and value systems are supposed to influence risk perceptions, risk judgments, and preferences for risk management strategies (Steg and Sievers 2000). There are four viable ways of life, which have a self-preserving pattern of risk perceptions: hierarchy (high-grid and highgroup), egalitarianism (high-group but low-grid), individualism (low-group and low-grid), and fatalism (high-grid but low-group) (Marris et al. 1998). Individuals perceive things that endanger their own way of life as risky (Oltedal et al. 2004). Thompson (2003) used people's attitudes towards ecological systems as a basis for their analysis to develop clumsy public solutions. Myths of nature have been applied to explain differences in environmental risk perception, risk judgments, and preferences for risk management strategies on a societal level. These are interwoven with world-views and ways of life and can be categorized as nature capricious (fatalist), nature perverse/tolerant (hierarchist), nature benign (individualist), and nature ephemeral (egalitarian) (Steg and Sievers 2000).

Table E.1. Measures and Variables of Seismic Adjustment Adoption by Households

Measures	Variables	Authors
Social and Demographic Characteristics	Age	Turner et al. (1986); Kiecolt et al. (1982); Palm et al. (1990); Dooley et al. (1992); Mileti and Darlington (1995)
	Education	Jackson (1977; 1981); Turner et al. (1986); Kiecolt et al. (1982); Palm et al. (1990); Edwards (1993); Russel et al. (1995); Mileti and Darlington (1995)
	Gender	Mileti and O'Brien (1992)
	Income	Jackson (1977; 1981); Turner et al. (1986); Kiecolt et al. (1982); Edwards (1993); Russel et al. (1995); Percentage of net equity: Palm et al. (1990); Occupation: Mileti and Darlington (1995); Employed: Russel et al. (1995)
	Household Structure	Marital Status: Turner et al. (1986); Kiecolt et al. (1982); Dooley et al. (1992); Children at home: Turner et al. (1986); Kiecolt et al. (1982); Palm et al. (1990); Dooley et al. (1992); Edwards (1993); Aged at Home: Palm et al. (1990)
	Tenure and Home-ownership	Dooley et al. (1992) ; Russel et al. (1995) ; Turner et al. (1986) ; Palm et al. (1990)
	Ethnicity/ Immigrant Status	Ethnicity: Turner et al. (1986); Kiecolt et al. (1982); Palm et al. (1990); Dooley et al. (1992); Edwards (1993); Immigrant Status: (23) Bourque et al (1997)
Housing Characteristics and Risk/ Location	Age of Structure	Palm et al. (1990); Palm and Hodgson (1992a)
	Home Value	
	Location; Fault Proximity	
Risk Perception	Specific risk perceptions	Characteristics of the event (probability, severity and imminence): Mulilis and Lippa (1990); Mulilis and Duval (1995) Earthquake Probability: Turner et al. (1986); Kiecolt et al. (1982); Mulilis and Lippa (1990); Farley et al. (1993); Mulilis and Duval (1995); Expected Earthquake in next years/ immediacy: Palm and Hodgson (1992a); Mileti and Fitzparick (1992; 1993); Mulilis and Duval (1995); Mileti and Darlington (1995) Expected Damage: Jackson and Mukerjee (1974); Jackson (1977; 1981); Damage Probability and Cost: Kunreuther et al. (1978); Palm et al. (1990); Event Severity: Mulilis and Lippa (1990); Mulilis and Duval (1995); Threat of death or injury: Showalter (1993) Personal consequences: Probability and cost of property damage: Kunreuther et al. (1978); Palm et al. (1990); Personal death/injury: Showalter (1993)
	Hazard Awareness and Risk Personalization	Sullivan et al. (1977); Jackson and Mukerjee (1974); Turner et al. (1986); Dooley et al. (1992); Mileti and Fitzparick (1993); Palm and Hodgson (1992b)
	Global risk perceptions (earthquake concern, having trouble, fear/worry/anxiety)	Jackson and Mukerjee (1974); Kiecolt et al. (1982); Turner et al. (1986); Dooley et al. (1992); de Man and Simpson-Housley (1987); (Lehman and Taylor (1987) with students); Dooley et al. (1992); Mileti and Darlington (1995)

Individualists. They fear things that might obstruct their individual freedom. Individualists support market liberalism and believe that people should have the opportunity to keep their economical gains for themselves. The individualist sees the nature as self-preserving, with the ability to reestablish its own status quo. Hence, people do not need to care a great deal about how nature is treated (Oltedal et al. 2004). Nature benign legitimizes individualistic social relations. Resources as well as needs are controllable, when environmental risks are opportunities for the rise of new technological solutions. Therefore, they are less bothered by environmental problems. Since they are opposed to collective control, i.e. government regulation, their rational risk management strategy is the market system. They strongly believe in market forces and in equal opportunity for all (Steg and Sievers 2000). However, individualists are not good customers of insurance. When they think that social security is a bad deal, they prefer individual investments and informal personal networks (Ingram 2009).

Egalitarians. They fear development that may increase the inequalities amongst people. They tend to be skeptical to expert knowledge, because they suspect that experts and strong institutions might misuse their authority. Egalitarians are placed politically to the left, and support political action aiming to increase social equality, like placing the highest taxes on the society's richest members (Oltedal et al. 2004). Nature ephemeral legitimizes egalitarian social relations. They are very concerned with environmental problems. Egalitarians prefer risk management strategies that foster equality of outcomes for present as well as future generations. Because resources are supposed to be depleting (and not controllable), the only solution is to control one's needs. Therefore, they call for radical changes in behavior and society (Steg and Sievers, 2000). Egalitarians tend to be good customers for insurance, when they prefer social insurance and security programs. They also favor increasing social security tax on wealthy (Ingram 2009).

Hierarchical. They emphasize the natural order of the society and the perseverance of this order. They fear such tings as social commotion, demonstrations, and crime. The hierarchist see nature as largely self-preserving, though within strict and rigid limits. If people cross these limits, nature will no longer be able to heal itself, and this may have dramatic consequences (Oltedal et al., 2004). Hierarchists believe environmental problems can be controlled by government regulations based on experts' knowledge on the limits of growth. The rational risk management strategy is sustainable growth (WCA 1987). They usually buy carefully determined amount of insurance, when they believe that social security can keep lower costs than private industry (Ingram 2009).

Fatalists. They take little part in social life, though they feel tied and regulated by social groups they do not belong to. They are quite indifferent about risk, i.e. unaware of dangers, since risks are assumed as unavoidable. They try not to know or worry about things they think they can't do anything about. (Oltedal et al. 2004). Nature capricious, which justifies fatalistic social relations, represents nature as an unmanageable, unpredictable, *uncontrollable* and inefficacious system. Risk perception is based on the belief that what you don't know cannot harm you. Their rational risk management strategy is "Why bother?" This attitude rationalizes isolation and resignation to stringent control on their behavior. Fatalists do not differ systematically and consistently from the other myths of nature because they are not consistent in their thinking and acting; the fatalist is just coping (Steg and Sievers 2000). They tend to buy low premium but high benefit insurance like travel insurance. they believe that social security will not pay benefits by the rime, so they there is no need to waste time (Ingram 2009).

The initial empirical support for the theory was described by Wildavsky and Dake (1990), when Dake (1991) have tried to empirically verify the cultural theory (Oltedal et al. 2004). They claimed that cultural biases or world views, i.e. hierarchical-, egalitarian-, and individualistic ways of life can predict a broad pattern of risk perceptions. They developed indexes as scale-scores for cultural biases and attempted to correlated these scores with risk perception ratings. Index for hierarchy is based on patriotism, law and order and ethical standards. In addition, assertions expressing concern about the lack of discipline among young people nowadays are included. Individualism index expresses support of continued economical growth as the key to quality of life, and private profits as the main rationale for hard work. The index contains assertions in favour of a weaker government control. The index for egalitarianism intends to measure attitudes towards social equality of conditions. In the study, cultural adherence was found to be the best predictor of risk perception. Other predictors tested were personality, economy, knowledge, political attitudes, and level of knowledge. Dake (1991) claimed that his study gave strong support to the cultural theory of risk perception (Oltedal et al. 2004).

Technical Perspective

Studies that are made from technical perspective, i.e. 'hazard approach' and 'cognitive theories', have more empirical findings than socio-cultural theory. According to technical perspective, households are also constraint or enabled with culture, which links households to society. Therefore, culture is another factor that influences the vulnerability households. Socio-cultural values, can be argued in terms of beliefs about nature, human activity (such as fatalism and controllability) and perception of individual versus collective roles and responsibilities (Palm 1990). In addition, trust on institutions can also be influential. undertaken from.

Perceived Controllability of Hazards: The studies that deal with coping with earthquake threat in pre-earthquake processes used the 'stress appraisal model' of Lazarus and Folkman (1984), which conceptualized that threatened people are more likely to take preventive action (prefer behavioral coping instead of emotional coping), if they perceive threat controllable. However, people deny the threat, if they perceive it as uncontrollable (Dooley et al. 1992). Consistent with this model, De Man and Simpson-Housely (1987) found positive relationship between damage reduction measures and damage expectation, while denial was seen among people who failed to take preventive measures. According to Dooley et al. 1992, high earthquake concern increases preparation, if people perceive the threat or the preparatory behavior is controllable by themselves.

Perceived Protection Responsibility and Trust on Institutions: First researches on the beliefs about perceived protection responsibility from seismic hazard in USA revealed that respondents usually believe that federal government was the most responsible (Jackson 1977, 1981). In further studies, however, people perceived earthquake preparedness responsibility as belong to individuals, which was involved with higher level of seismic adjustment adoption (Mulilis and Duval 1997). In addition, failure of risk control efforts addresses lack of trust, transparency and openness in several studies, when increased trust in institutions can increase level of risk perception, improve transparency and opennes, which can increase risk reduction behavior (Arlikatti 2006).

Fatalism and Perceived Personal Control: Fatalistic attitudes of households are found as related to some research such as Turner et al. (1986), while fatalistic judgements are considered as lack of 'self-efficacy'in research of Mulilis et al. (1990). Likewise, perceived personal control is also considered in researches of Mulilis and Duval (1995) and Arlikatti (1999).

PERCEIVED ATTRIBUTES OF STAKEHOLDERS/ GATEKEEPERS AND DISASTER POLICIES

According to stakeholder approach [Appendix C], gatekeepers can be individuals such as urban managers, planners, emergency managers, real estate agencies and/or impersonal structures such as programs or policies involved with urban development and natural disasters. Gatekeepers are set between micro and macro levels and influence the relationship between individuals, society and environment in terms of their societal roles or systems. These may constrain or enable individual behavior through their administration of societal rules and provision of information. Each factor can be involved with different strategies and power role relations. Using expert and information power addresses designing risk communication strategies; and therefore, assessment of risk perception (Arlikatti 2006). That is, effectiveness of a risk communication strategy can be found in terms of its influence on risk perception levels of other stakeholders, e.g. households. How the households perceive responsibilities for insurance purchase and risk mitigation, within the implemented policies, can also be useful to understand effectiveness of a strategy that uses the legitimate power. Trustworthiness, i.e. referent power, of stakeholders that implies the policy can also be influential on decision process of households. In addition, assessing social vulnerability provides to envisage targeted programs to the vulnerable, which means using the rights component of legitimate power. In addition, implementation of 'regulatory' power can be assessed through the success of 'mandates' or 'incentives'. In other words, designing suitable strategy depends on constructing suitable power and role relations through gatekeepers or stakeholder. Therefore, assessing the varying aspects of households can indicate failures in current implementation of policies; or can indicate potentials of society to implement risk mitigation or insurance policies as well as complementary policies. For this reason, this section reviews frameworks and findings of these different approaches to assess varying aspects of households' decision process.

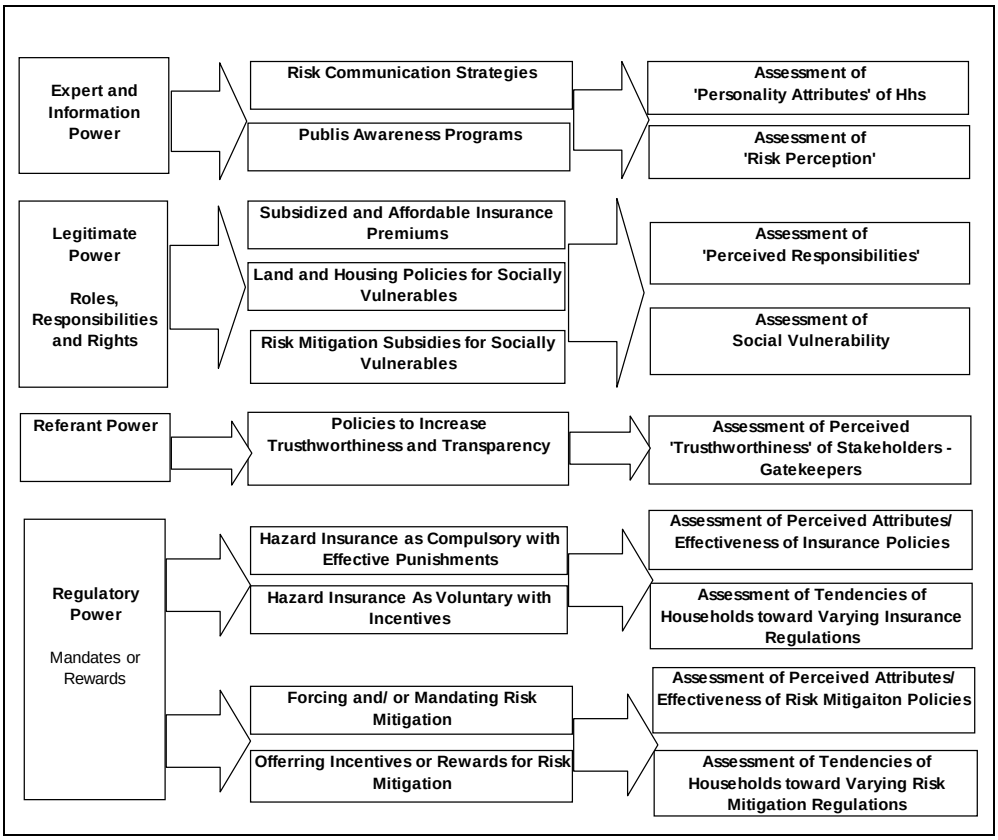


Figure E.1. Designing Risk Mitigation Strategies through Establishing Power and Role Relations
(Drawn by authors, Source: from Lindell et al. 1997 and Arlikatti 2006).

[1] Second article gives the task of giving information to public about occurred disasters or disasters that are possible to occur. Fifth article gives the task of searching measures to prevent citizens and national wealth; and to publish them for public interest. 16th article says that settlement should be moved if necessary.

[2] In 1958, the Organic Law (No. 7116) of former MPWS charged with taking 'all necessary measures before and after disasters' (article 2). In 1983, Law Amending Ordinance (No: 180) that reorganized bureaucracy charged MPWS with 'execution of disaster services in an efficient, orderly and swift manner' (article 1).

[3] Disaster Central Coordination Council, National Defense, Ministries (Foreign Affairs, Internal Affairs, Finance and Customs, National Education, Health and Social Aid, Transportation, Agriculture, Forestry and Rural Affairs, Working and social Security, Industrial and Trade, Energy and Natural Resources), General Chair of Turkish Red-Crescent and the Representative of General Staff. The task of this council is to communicate, coordinate and aid each other with Prime ministry. Other involved bodies in disaster management can be described as 1) Crises Management Center (Temporary Ad-Hoc); 2) Prime Ministry - General Directorate (GD) of Emergency Management of Turkey; 3) Ministry of Interior: a. GD of Civil Defense and b. GD of Provincial Administration; 4) Local Authorities: a. Governorates and b. Municipalities; and 5) Other Institutions and Authorities: a. GD of Turkish Red-Crescent and b. Turkish Armed Forces.

[4] *Province Committee of Rescue and Aid*, managed by the governor and responsible for implementing province emergency plans, investigating plans in districts; determining principles of aids; ensuring needs; if necessary, paying out emergency aids, temporary shelters and renewal to victims. *Province Disaster Bureau,* is responsible for providing approval of emergency plans, their accrue and conceal; monitoring plan changes and giving information to personnel. *District Rescue and Emergency Committee* is responsible for duties determined by Kaymakam regarding duties of Province Rescue and Aid Committee.

[5] The tasks of the Council are identified as: 1) scientific assessment of earthquake predictions and informing the public; 2) identification of priority research areas concerning mitigation; 3) consultancy to public bodies and the development of policy and strategies; 4) ethical matters concerning earthquake prediction (Balamir 2001a).

[6] These activities are describes in Article 7.as: 1) preparing natural disaster plans coherent with the city-scale development plans and undertaking other metropolitan-scale preparations; 2) allocating places of production and storage of hazardous materials; 3) controlling the measures taken for the fire and other disasters in private and public bulidings.

[7] These are described in Article 73 as: reconstructing and restoring obsolescent areas of the city in accordance with the city development; designating residential areas, industrial and commercial areas, social areas and techno-parks; taking preventive measures for earthquake risks or protecting historical and cultural texture of the city.

[8] In addition, this realist approach to risk is diversified in various disciplines such as engineering, psychology, economics, medicine and epidemiology due to new catastrophic and long-lasting damage potential of new risks. They handle with risk as an objective phenomenon by accepting risk as pre-existing in nature, which can be identified and controlled through scientific measurement and calculation that are based on the probability calculations of hazard (Lupton 1999a: 17; Lupton 1999b: 2). That is, a new discipline is emerged as risk analysis, which focuses on risk assessment and risk management. When risk assessment deals with the identification, quantification, and characterization of health and environmental risks, risk management involves communication, mitigation, and decision making issues (Slovic and Weber 2002).

[9] The concern of social scientists of this approach became the conflict between scientists, industrial and governmental organizations and the public in the 1970's in USA. Public is evaluated as becoming more critical to the activities of industry and government by having an increasing awareness on risks and distrust of institutions since 1950s (Slovic and Weber 2002; Sjöberg et al. 2004; Lupton 1999a: 18; Lupton 1999b: 2). *Social scientists* accept scientific risk estimation as real, 'accurate' and 'objective' risks, when they evaluate public as 'lay people' that under- or over-estimate some risks subjectively. Lay people make 'biased' judgments by using 'intuition', because they respond to risk unscientifically due to lack of scientific knowledge about risk (Tierney 1999: 218; Slovic 1987; Lupton 1999b: 2; Lupton 1999a: 18-9). They attempt to measure the decision process and behavior of people with rationalist approaches (Lupton 1999b: 2). Their main concern with risk is 'risk perception' in terms of social and psychological factors, which are based on 'cognitive' science in psychology (Lupton 1999a: 17-8). The field of psychometric studies of risk attempt to assess people's risk perception in terms of heuristics or different frames (Slovic and Lichtenstein 1979 and Slovic 1992 cited in IADB 2003). Risk communication gained significance in this context.

APPENDIX F

QUESTIONNAIRE FORM

Sayın Hanehalkı,

Bu araştırma, toplumun deprem tehlikesini nasıl gördüğünü ve deprem tehlikesine karşı hazırlıklı olmaya ne ölçüde önem verdiğini tespit etmeye çalışmaktadır. Bu ankete verilen yanıtlar, daha etkili hazırlık biçimlerinin belirlenmesini sağlayacaktır. Bu nedenle, ankette yer alan soruların tamamını yanıtlamanız araştırma açısından büyük önem taşımaktadır. Anketin uygulanması için tesadüfi yöntemle seçilen Hanehalkları arasında siz de yer almaktasınız. Bu uygulamada kimliğiniz gizli kalacak ve anket bilgileri başka amaçla kullanılmayacaktır.

Vereceğiniz cevaplar, Merkezi Yönetim, Büyükşehir Belediyesi, İlçe Belediyesi, DASK (Doğal Afet Sigortası Kurumu) ve başka kurumlar tarafından dikkate alınması beklenen bu araştırma sonuçları açısından büyük önem taşımaktadır. Anketin, ***Hanehalkı reisleri tarafından yanıtlanması*** istenmektedir. Gösterdiğiniz ilgi ve ayırdığınız zaman için teşekkür ederiz.

Orta Doğu Teknik Üniversitesi (ODTÜ) / Afet Yönetimi Merkezi /
Şehir ve Bölge Planlama Bölümü Araştırma Grubu

1. Hanenizde yaşayan kişilerle ilgili bilgileri aşağıdaki tabloya yazınız.
(Eğitim Durumu için, kişinin bitirdiği okulu "ilk, orta, lise, yüksek okul, üniversite, yüksek lisans ve doktora" seçeneklerinden biri ile belirtiniz.)

Hanedeki Kişiler/ Hanehalkı Reisine Yakınlığını belirtiniz:	Cinsiyet		Yaş	Eğitim Durumu	Mesleği	İşi
	Kadın	Erkek				
1. Hanehalkı Reisi						
2. Eşi						
3. Oğlu/Kızı						
4. Oğlu/Kızı						
5. Oğlu/Kızı						
6. Başka						
7. Başka						
8. Başka						
9. Başka						

2. Hane gelirleriniz arasındaki en önemli ikisini işaretleyiniz.

❑ Ücret Geliri (Özel Kuruluş)	❑ Maaş Geliri (Resmi Kurum)	❑ Serbest Meslek Geliri	❑ Kira Geliri	❑ Sermaye ve Faiz Geliri	❑ Başka:.....

3. Hanehalkı aylık toplam net geliriniz hangi gruba düşer?

❑ 5000 YTL Üstü	❑5000- 2000YTL	❑2000–1000 YTL	❑ 999-751 YTL	❑ 750-500 YTL	❑ 499-201 YTL	❑ 200 YTL'den Az

4. Size göre, aşağıdaki harcama kalemlerinden hangilerine gereğinden az ya da fazla harcama yapıyorsunuz? (Her satırı ayrı yanıtlayınız.)

	Gereğinden Çok Az 1	*Gereğinden Az 2*	*Gerektiği Kadar 3*	*Gereğinden Fazla 4*	*Gereğinden Çok Fazla 5*
Gıda					
Eğitim					
Konut					
Ev Eşyası					
Sigorta Harcamaları					
Giyim					
Sağlık					
Eğlenme/Dinlenme/ Kültür					
Ulaşım					
Başka:.....					

5. Ödediğiniz, elektrik, su, telefon ve emlak vergisi gibi zorunlu ödemeler dışında, konutunuza yaptığınız tamir, bakım, onarım ve yenileme giderleri için yıllık ne kadar harcamaktasınız?

Yaklaşık ..... YTL

6. Oturduğunuz KONUT'un özellikleri:

- Büyüklüğü:	.....m^2			
- Oda sayısı: (mutfak ve banyo hariç)	.....oda			
- Piyasadaki alım satım değeri nedir?	.....YTL			
- Konutunuzu kiraya verecek olsanız aylık net kirası ne kadar olurdu?	.....YTL			
- Konutunuzu hangi yolla edindiniz?	❑ Satın aldım	❑ Miras	❑ Kendim Yaptırdım	❑Başka: ...

7. Oturduğunuz konutun bulunduğu BİNA'nın özellikleri:						
Bina kaç katlı? (bodrumlar hariç)	..... kat					
Binada toplam kaç daire var?	.....daire					
Bina yaklaşık kaç yıllıktır?	.....(yıl)					
Binanın taşıyıcı sistem özelliği nedir?	❑ Yığma	❑ Betonarme	❑ Karkas	❑ Çelik	❑ Ahşap	❑ Başka: ...
Binada kaç adet ticarethane ve büro var?	…… Adet		❑ Yok			
Binanın taşıyıcı sisteminde (kolon, kiriş, duvar gibi) değişik yapan oldu mu?	❑ Evet (Açıklayınız: ……..... ……..)			❑ Hayır	❑ Bilmiyorum	
Binaya ait otopark:	❑ Var			❑ Yok		

8. Bu konutta kaç yıldır oturuyorsunuz?	……(Ay) ya da …… (Yıl)

9. Bu konutta kaç yıl daha oturmayı planlıyorsunuz?	…… (Yıl) ya da: ……

10. Bu konuttan yakın zamanda taşınmayı planlıyor musunuz?	❑Evet (Neden?: ……)	❑ Hayır

11. Evinizde, aşağıdaki eşyaların hangileri var? Olanları işaretleyiniz:			
❑ Buzdolabı	❑ Çamaşır Makinesi	❑ Bilgisayar	❑ Fotoğraf Makinesi
❑ Fırınlı Ocak	❑ Şofben/ Su Isıtıcısı	❑ Internet Bağlantısı	❑ Cep Telefonu
❑ Mikro Dalga Fırın	❑ Elektrik Süpürgesi	❑ Televizyon	❑ Ev Telefonu
❑ Bulaşık Makinesi	❑ Kombi	❑ Uydu Anteni	❑ Dikiş Makinesi
❑ Mutfak Robotu	❑ Müzik Seti	❑ Sinema /DVD Seti	❑ Örgü Makinesi
❑ Başka: ……	❑ Başka: ……	❑ Başka: ……	❑ Başka: ……

12. Varsa, garanti süresi dolmamış eşyanızı belirtiniz:		
❑ Bilmiyorum	❑ Yok	❑ Var: ……/……/……

13. Özel oto ya da aracınız var mı?	❑ Var	❑ Yok (14. soruya geçiniz)

13a. Aracınızın ne tür sigortası var?	❑ Trafik Sigortası	❑ Kasko	❑ Yok

13b. Aracınızın deprem sigortası var mı?	❑ Var	❑ Yok

14. Aşağıdaki güvenlik önlemlerinden hangilerine sahipsiniz?		
❑ Çelik Daire Kapısı	❑ Arabada Yangın Söndürücü	❑ Pencerelerde Demir Parmaklık ya da Panjur
❑ Evde İlkyardım Çantası	❑ Konutta Yangın Söndürücü	❑ Apartman Dış Kapısında Sesli/ Görüntülü Otomatik Kapı Açma Mekanizması
❑ Araba Alarmı	❑ Konutta Alarm	❑ Başka: ……

15. Zorunlu Deprem Sigortasına ilişkin bilgi aldınız mı?	
❑ EVET *(Lütfen **15a**'yı cevaplayınız.)*	❑ HAYIR *(Lütfen **16.** sorudan devam ediniz.)*

15a. Zorunlu Deprem Sigortasına ilişkin nereden bilgi aldınız?			
❑ Arkadaşlar ve Akrabalar	❑ Televizyon Reklamları	❑ Belediye	❑ Internet
❑ Komşular/ Apartman Yöneticisi	❑ Basında Yer Alan Haberler	❑ Banka/ Sigortacı	❑ Başka: .....

16. Okuduğunuz günlük gazete ya da abone olduğunuz yayın varsa, zorunlu deprem sigortası hakkında bilgi veriyor mu?	
❑ **Yok**	❑ **Var** **a) Yayını Belirtiniz:** ……/……/……) **b) Verilen bilgi sizce yeterli mi?** ❑ **Evet** ❑ **Hayır**

17. Zorunlu Deprem Sigortasına ilişkin hangi konularda bilgilenme gereği duymaktasınız?	
❑ Ödemek Zorunda Olduğum Prim Miktarı (Yıllık Sigorta Ödemesi)	❑ Alabileceğim Tazminat Miktarı
❑ Toplanan Paranın Nerede ve Kim Tarafından Kullanıldığı	❑ Ek Konut Sigortası Yaptırmak
❑ Yapı Ruhsatı Zorunluluğu	❑ Başka: .....

18. Oturduğunuz konut için zorunlu deprem sigortası yaptırdınız mı?	
❑ **EVET** *(**18A** bölümüne geçiniz.)*	❑ HAYIR *(**18B** bölümüne geçiniz)*

18 A

1. Hangi yıllarda zorunlu deprem sigortası yaptırdınız?						
❑ 2000	❑ 2001	❑ 2002	❑ 2003	❑ 2004	❑ 2005	❑ 2006

2. En son ödediğiniz zorunlu deprem sigorta PRİMİ ne kadar?	Yaklaşık……..……. YTL

3. Zorunlu deprem sigortasına ödediğiniz prim karşılığındaki TAZMİNAT miktarı ne kadar?	Yaklaşık……..……. YTL

4. Zorunlu Deprem Sigortasını yaptırma kararınızda aşağıdakilerden hangileri ne ölçüde etkili oldu? (Her satırı ayrı yanıtlayınız.)	*Hiç Etkili Değil 1*	*Biraz Etkili 2*	*Etkili 3*	*Oldukça Etkili 4*	*Çok Etkili 5*
Sigortalı olmanın sağladığı güven duygusu					
Konutumun zarar görme olasılığı					
Devletin afet zararlarını karşılamaktan vazgeçmesi					
Yıllık sigorta ödemesinin (prim) uygun olması					
Evsahiplerinin konutlarda meydana gelecek hasardan finansal sorumluluğu olduğu düşüncesi					
Ailem için duyduğum endişe					
Komşularımın teşvik etmesi					
Arkadaş çevremin teşvik etmesi					
Bilim adamlarının açıklamaları					
Sigortanın zorunlu olması					
Sigorta yaptırmayana ceza verilecek olması					
Konut alım-satım işlemleri sırasında gerekli olması					
Başka:					

5. Zorunlu Deprem Sigortası ile ilgili aşağıda belirtilen düşünceleri ne ölçüde katılırsınız? (Her satırı ayrı yanıtlayınız.)	*Kesinlikle Katılıyorum 1*	*Katılıyorum 2*	*Kararsızım 3*	*Katılmıyorum 4*	*Kesinlikle Katılmıyorum 5*
Oturduğum konuta ait deprem sigortası poliçemi her yıl yenilemek istiyorum.					
Oturduğum konut için zorunlu deprem sigortasına ek olarak ayrıca özel deprem sigortası da yaptırmak istiyorum.					
Deprem sigortası yıllık ödemeleri (sigorta primi) bütçeme göre fazla geliyor.					
Deprem sigortası tazminat miktarını yetersiz buluyorum.					
Deprem sigortasından vazgeçmeyi düşünüyorum.					
Sahibi olduğum diğer konutlar için de deprem sigortası yaptırmayı doğru buluyorum.					
Başka: ……					

Lütfen 19. soruya geçiniz.

18 B

1. Zorunlu Deprem Sigortası yaptırmadıysanız, hangi nedenler etkili oldu? (Her satırı ayrı yanıtlayınız.)	*Hiç Etkili Değil 1*	*Biraz Etkili 2*	*Etkili 3*	*Oldukça Etkili 4*	*Çok Etkili 5*
Sigorta yıllık ödemelerinin (prim) pahalı olması					
Binanın sağlam olduğu düşüncesi					
Binada oturanların sigorta yaptırmamış olması					
Devletin yardım edeceği düşüncesi					
Sigorta tazminat miktarının az olması					
Sigorta yaptırmayana ceza olmaması					
Kimsenin sigortalı olup olmadığını sormaması					
Burada uzun süre oturmayı düşünmemem					
Yeteri kadar vaktimin olmaması					
Yeteri kadar bilgimin olmaması					
Bu konutta kiracı olmam					
Başka: ……					

2. Oturduğunuz konut için, bundan sonra zorunlu deprem sigortası yaptırmayı düşünüyor musunuz?	
❑ EVET (Nedenini açıklayınız: ……)	❑ HAYIR (Nedenini açıklayınız: ……)

Lütfen devam ediniz:

19. Şu anda hangi konularda sigortalısınız?			
❑ İhtiyari Deprem Sigortası	❑ Konut Sigortası	❑ Yangın Sigortası	❑ Kaza Sigortası
❑ Hayat / Emeklilik Sigortası	❑ Sağlık Sigortası	❑ İşyeri Sigortası	❑ Hırsızlık Sigortası
❑ Evdeki Eşyaların Deprem Sigortası	❑ Başka: ……	❑ Başka: ……	❑ Başka: ……

20. Siz ve Hanehalkı fertleri oturduğunuz konut dışında, aşağıdakilerden hangilerine sahip?					
❑ Konut	❑ Dükkan	❑Depo	❑ Arsa	❑ Başka: ……	❑ Hiçbirine (**21.**soruya geçiniz)

20a. Oturduğunuz konut dışında sahip olduğunuz diğer taşınmazlardan herhangi biri depreme karşı sigortalı mı?	❑ Evet	❑ Hayır

21. Oturduğunuz binada SİZCE kaç kişi zorunlu deprem sigortası yaptırdı?	
❑ …… Kişi	❑ Bilmiyorum

22.Oturduğunuz binada, zorunlu deprem sigortası yaptırmamış olanlar varsa hangi nedenlerle yaptırmıyorlar?	
❑ Önemsemiyorlar	❑ Devletin yardım edeceğini düşünüyorlar.
❑ Pahalı buluyorlar.	❑ Kiracı oldukları için yaptırmıyorlar.
❑ Depremin binaya zarar vermeyeceğini düşünüyorlar.	❑ Bilmiyorum
❑ Başka: ……	❑ Başka: ……

23. ***Şiddetli bir deprem*** **olabileceğini düşünerek:**			
Konutunuzda meydana gelecek kaybınız ne kadar olur?	Yaklaşık…… YTL		
Konutunuzda meydana gelecek kaybı karşılayacak zorunlu deprem sigortası tazminatı için yıllık ne kadar prim ödemeye katlanabilirsiniz?	Yaklaşık…… YTL		
Evinizdeki eşyalarda meydana gelecek kaybınız ne kadar olur?	Yaklaşık…… YTL		
Eşyalarda meydana gelecek kaybı karşılayacak zorunlu deprem sigortası tazminatı için, yıllık ne kadar prim ödemeye katlanabilirsiniz?	Yaklaşık…… YTL		
Bedensel zararınız ne olur?	❑ Hafif yaralı	❑ Orta Yaralı	❑Ağır Yaralı
Depremde Hanehalkı fertlerinin can kaybı veya bedensel zararına karşı, kişi başı yıllık ne kadar prim ödemeye katlanabilirsiniz?	Yaklaşık…… YTL		

24. Şiddetli bir deprem olursa, karşılaşacağınız kayıpların karşılanmasında, hangi kaynakları öncelikle kullanırsınız? (Her satırı ayrı yanıtlayınız.)						
	1. Derecede Öncelikli	*2. Derecede Öncelikli*	*3. Derecede Öncelikli*	*4. Derecede Öncelikli*	*5. Derecede Öncelikli*	*6. Derecede Öncelikli*
Kendi Varlıklarım ve Birikimim						
Akrabalar/ Arkadaşlar						
Banka kredisi/ borcu						
Zorunlu Deprem Sigortası						
Diğer Sigortalar						
Devlet Yardımı						

25. Zorunlu Deprem Sigortası, geçici bir *kanun hükmünde kararname* ile yürütülüyor. Sizce bu kanunlaşmalı mı?		
❑ Evet	❑ Hayır	❑ Bilmiyorum
Açıklayınız:		

26. Zorunlu deprem sigortasının "kapsamı" ve "prim miktarları" ile ilgili aşağıdaki ifadelere ne ölçüde katılıyorsunuz? (Her satırı ayrı yanıtlayınız.)					
	Kesinlikle Katılıyorum 1	*Katılıyorum 2*	*Kararsızım 3*	*Katılmıyorum 4*	*Kesinlikle Katılmıyorum 5*
Ruhsatsız binalar da sigorta kapsamına alınmalı.					
Ruhsatsız ve kaçak yapılaşmış binaların, sigorta primleri daha yüksek tutulmalı.					
Düşük risk altındaki insanlar daha az prim ödemeli.					
Ruhsatsız ve kaçak yapı sahipleri dar gelirli ailelerdir.					
Yüksek risk altında bulunan dar gelirli ailelerin sigorta primlerinin tamamını ödemeleri adil değil.					
Sigorta için yıllık ödemeler, risk düzeyine göre belirlenirse, dar gelirli aileler aleyhine olur.					
Devlet dar gelirli ailelere, ayrıca sigorta yardımı yapmalı.					
Sigorta için yıllık ödemeler risk düzeyine göre değişmemeli. Herkes eşit oranda sigorta primi ödemeli. Böylece, düşük riskliler yüksek risklilere yardım etmiş olur.					
Sigorta pimleri, riske göre farklılaşmalı. Böylece, ev sahipleri olası riskleri azaltmak için teşvik edilmiş olur.					
Başka: ……					

27. "Zorunlu deprem sigortası" ve "deprem öncesi zarar azaltma" ile ilgili aşağıdaki ifadelere ne ölçüde katılıyorsunuz? (Her satırı ayrı yanıtlayınız.)					
	Kesinlikle Katılıyorum 1	*Katılıyorum 2*	*Kararsızım 3*	*Katılmıyorum 4*	*Kesinlikle Katılmıyorum 5*
Sigorta sistemi, güçlendirilmiş binalara sertifika vererek insanları güvenlik önlemleri almaya teşvik etmeli.					
İnsanlar sigorta yaptırmıyor. Çünkü sigortaları olmadığı halde devletin afet durumunda yardım edeceğini düşünüyorlar.					
Toplanan sigorta ödemelerinin sadece deprem için kullanılacağından eminim.					
Toplanan sigorta kaynakları, Türkiye'de deprem öncesi zarar azaltma yatırımları için kullanılmalı.					
Sigortada toplanan kaynaklar, sadece deprem sonrasında kullanılmamalı, aynı zamanda mevcut sigortalı yapıların güçlendirilmesi için de kullanılmalı.					
Toplanan sigorta kaynaklarından, belediyelere güçlendirme ve iyileştirme projeleri için kredi verilmeli.					
Belediyeler, güçlendirme çalışmalarındaki çabaları ve başarılarına göre sigortadan kredi alabilmeli.					
Toplanan sigorta kaynakları bir kısmının okul, hastane ve diğer altyapı sistemlerinin taşıdığı riskleri azaltmak için bir fona aktarılmalı.					
Başka: ……					

28. Zorunlu Deprem Sigortasının, "zorunlu" veya "gönüllü" hale getirilmesi ile ilgili aşağıdaki ifadelere ne ölçüde katılıyorsunuz? (Her satırı ayrı yanıtlayınız.)					
	Kesinlikle Katılıyorum 1	*Katılıyorum 2*	*Kararsızım 3*	*Katılmıyorum 4*	*Kesinlikle Katılmıyorum 5*
Herkes deprem sigortası yaptırmak zorunda olmalı.					
Depremden zarar görme olasılığı düşük olanlar da dahil herkes deprem sigortası yaptırmalı.					
Bazıları sigorta yaptırırken diğerlerinin yaptırmaması adil değil.					
Sigorta bir çeşit deprem vergisi gibi düşünülmeli.					
Sigorta yaptırmayana etkili cezalar getirilerek, sigorta gerçekten zorunlu kılınmalı.					
Cezaları ağırlaştırılmış bir "deprem sigortası kanunu" çıkarılmalı.					
Deprem sigortası ödemesi, elektrik, su, telefon faturası gibi zorunlu ödemelere yansıtılabilir.					
Deprem sigortası, emlak vergisine yansıtılabilir.					
İnsanların bu sigorta sistemine katılmak istememeleri beni şaşırtıyor.					
Sigorta, deprem zararlarının toplum tarafından paylaşılmasını sağlayan bir sosyal yardımlaşma biçimidir.					
Toplumun depreme karşı iyi hazırlanabilmesi için deprem sigortasının zorunlu olması gereklidir.					
Deprem sigortası zorunlu olmazsa, kimse sigorta yaptırmaz ve deprem sonrası devletten yardım bekler.					
Deprem sigortasının zorunlu olup olmaması farketmez; çünkü devlet bunu zorlamıyor.					
İnsanlar ikna edilerek, sigortayı gönüllü olarak yaptırmaya özendirilmeli.					
Sigorta tamamen gönüllü olarak yaptırılmalı ve bir bireysel seçim konusu olarak bırakılmalı. Kimse kendini korumak için zorlanmamalı.					
Sadece yüksek risk altındakiler deprem sigortası yaptırmaya zorlanmalı.					
Deprem sigortası, binadaki konutlar yerine tüm bina için zorunlu olmalı. Böylece, bir binadaki tüm birimler sigortalanmış olur.					
Sigorta sadece yüksek ve orta gelirli ev sahiplerine zorunlu olmalı.					
Başka: ……..					

29. Sizce, Zorunlu Deprem Sigortası'nın daha fazla kişi tarafından alınmasını sağlamak için neler yapılmalı? **(Her satırı ayrı yanıtlayınız.)**					
	Kesinlikle Katılıyorum 1	***Katılıyorum 2***	***Kararsızım 3***	***Katılmıyorum 4***	***Kesinlikle Katılmıyorum 5***
Televizyonda daha fazla reklama yer verilmeli					
Televizyonda deprem ve sigortayı anlatan programlar yapılmalı					
Okullara deprem ve sigorta ile ilgili dersler konulmalı					
Daha fazla tanıtım kampanyaları hazırlanmalı					
Sigortayı herkesin yaptırması için ulusal seferberlik ilan etmeli					
Elektrik, su ve doğalgaz faturalarının ödenmesi sırasında, deprem sigortası poliçesini göstermek zorunlu kılınmalı					
Sigorta yaptırmayana para cezası getirilmeli					
Sigorta yaptırmayana hapis cezası getirilmeli					
Sigorta yaptırmayana, devlet konut için yardım etmemeli					
Tüm binadaki sakinler sigorta yaptırmış ise, bu binaya her yıl sertifika verilmeli.					
Sigortasını her yıl yenileyen binalara, sigorta prim miktarında indirim uygulanmalı.					
Sigortasını her yıl yenileyenlere, emlak vergisinde indirim uygulanmalı					
Sigortasını her yıl yenileyenlere, belediye tarafından bina güçlendirme projesi geliştirmek için teknik yardım sağlanmalı					
Sigortasını her yıl yenileyenlere, bina güçlendirilmesi projelerinde öncelik verilmeli					
Sigortasını her yıl yenileyenlere bina güçlendirme için bankadan veya devletten kredi alma önceliği verilmeli.					
Binasını güçlendirenlere, sigorta primlerinde indirim uygulanmalı.					
Zorunlu deprem sigortası devletten tamamen bağımsız olarak özel sigorta sektöre bırakılmalı.					
Başka: ……					

30. Size göre, yaşadığınız kentte insanları tehdit eden *EN YAYGIN 3 TEHLİKE BİÇİMİ* hangileridir?			
❑ Trafik Kazaları	❑ Bulaşıcı Hastalık	❑ Sel	❑ Yangın
❑ Kapkaç ve Gasp Olayları	❑ Sağlıksız Gıda Ürünleri	❑ AİDS	❑ Terör
❑ Deprem	❑ Belediye Hafriyat Çukuruna Düşmek	❑ Kanser	❑ Hırsızlık
❑ Dolandırıcılık	❑ GSM Baz İstasyonları	❑ Kuş Gribi	❑ Başka: ……

31. Aşağıdaki tehlike ve tehditlerle kendinizin bizzat KARŞILAŞMA OLASILIĞINIZI belirleyiniz. **(Her satırı ayrı yanıtlayınız.)**					
Tehlike ve Tehdit Türü	***Özellikle Benim Başıma Gelmez 1***	***Benim Başıma Gelmez 2***	***Herkesin Başına Gelebilir 3***	***Benim Başıma Gelebilir 4***	***Özellikle Benim Başıma Gelebilir 5***
Trafik Kazaları					
Kapkaç Olayları					
Kanser					
Deprem					
Hırsızlık					
Dolandırıcılık					
Sel					
Belediye Hafriyat Çukuruna Düşmek					
AİDS					
Bulaşıcı Hastalık					
Gıda Zehirlenmesi					
Yangın					
GSM Baz İstasyonundan Etkilenme					
Terör Olayına Kurban Gitme					
Kuş Gribi					
Başka: ……					

32. Aşağıdaki tehlike ve tehditlere uğramanız halinde KAYIP DÜZEYİNİZ ne olur? (Her satırı ayrı yanıtlayınız.)

Tehlike ve Tehdit Türü	*Hiç Kaybım Olmaz 1*	*Kaybım Çok Az Olur 2*	*Kaybım Olabilir 3*	*Kaybım Çok Olur 4*	*Kaybım Çok Fazla Olur 5*
Trafik Kazaları					
Kapkaç Olayları					
Kanser					
Deprem					
Hırsızlık					
Dolandırıcılık					
Sel					
Belediye Hafriyat Çukuruna Düşmek					
AİDS					
Bulaşıcı Hastalık					
Gıda Zehirlenmesi					
Yangın					
GSM Baz İstasyonundan Etkilenme					
Terör Olayına Kurban Gitme					
Kuş Gribi					
Başka: ……					

33. Depremlerle ilgili sahip olduğunuz bilgi ve yargılarınızı hangi yolla edindiniz? (Birden fazla işaretleyebilirsiniz)

❑ Kendi Deneyimlerimden	❑ Büyüklerimin Anlatmış Olduklarından	❑ Tanıdık ve Arkadaşlarımın Başına Gelenlerden	❑ Yaptığım Bilimsel Araştırma ve Görüşmelerden	❑ Kitap, Gazete ve Televizyondan Edindiğim Bilgilerden

34. Daha önce bir deprem yaşadınız mı? (Böyle bir deneyiminiz yoksa, bu soruyu atlayabilirsiniz.)

Yıl	*Depremi Nerede Yaşadınız?*	*Sizin/ Yakınlarınızın Bedensel Zararı/ Can Kaybı?*	*Maddi Kaybınız? (TL)*	*Diğer Kayıplarınız*

35. 1999 depremleri sırasında, şimdi oturmakta olduğunuz bina hasar gördü mü?

❑ O sırada bu binada oturmuyordum.	❑ Çok Ağır Hasar	❑ Ağır Hasar	❑ Orta Hasar	❑ Az Hasar	❑ Hiç Hasar Görmedi

36. Aşağıdaki tabloda depremlerle ilgili çeşitli ifadelere ne ölçüde katıldığınızı belirtiniz. (Her satırı ayrı yanıtlayınız.)

	Kesinlikle Katılıyorum 1	*Katılıyorum 2*	*Kararsızım 3*	*Katılmıyorum 4*	*Kesinlikle Katılmıyorum 5*
Depremler önceden bilinemeyen doğa olaylarıdır.					
Depremlerden kaynaklanan zararlar, doğal koşulların ciddiye alınmamasının bir sonucudur.					
Depremlerden kaynaklanan zararlar, yanlış kentleşme ve yapılaşmanın bir sonucudur.					
Depremler, insanların bilinçli ve akıllı davranmalarını sağlamak için öğretici bir vesiledir.					
Depremlere karşı bilimsel ve teknik yöntemlerle büyük ölçüde önlem almak mümkündür.					
İnsanlar hangi önlemleri alırlarsa alsınlar, doğa güçleri karşısında başarı sağlama olasılığı zayıftır.					
Depremin vereceği zararlar önceden tahmin edilebilir.					
Türkiye'de büyük kayıp yaratan depremler çok sık olmuyor.					
Deprem kendim ve yakınlarım için büyük bir tehlike oluşturuyor.					
Deprem tehlikesini fazla düşünmemeye çalışıyorum.					
Ailede deprem tehlikesine daha duyarlı olanlar var.					
Depremde yaşamımı kaybedebilirim.					
Deprem, eskiden fazla bilinmiyordu. Yeni bir tehlike biçimi.					
Depremde maddi malvarlığımı büyük ölçüde kaybedebilirim.					
Deprem tehlikesi fazla abartılıyor.					

37. İstanbul'da gerçekleşmesi olası bir depremle ilgili aşağıda belirtilenlere ne ölçüde katılıyorsunuz? **(Her satırı ayrı yanıtlayınız.)**					
	Kesinlikle Katılıyorum 1	***Katılıyorum 2***	***Kararsızım 3***	***Katılmıyorum 4***	***Kesinlikle Katılmıyorum 5***
İstanbul'da ***gelecek 10 yıl içinde*** büyük bir deprem olma olasılığı çok yüksek.					
Yaşadığım sürece İstanbul'da büyük bir deprem olma olasılığı çok yüksek.					
İstanbul'da büyük bir deprem olursa, ***kentteki hasar*** çok büyük olur.					
İstanbul'da büyük bir deprem olursa, ***Zeytinburnu'ndaki*** hasar çok büyük olur.					
İstanbul'da büyük bir deprem olursa, ***yaşadığım binada*** hasar çok büyük olur.					
Bu bina hasar görürse, ***can kaybı*** yüksek olur.					

38. Sizce, aşağıdakiler depreme karşı ne ölçüde güvenli? (Her satırı ayrı yanıtlayınız.)					
	Hiç Güvenli Değil 1	***Az Güvenli 2***	***Güvenli 3***	***Oldukça Güvenli 4***	***Çok Güvenli 5***
Yaşadığınız Konut					
İşyeriniz					
Varsa çocuğunuzun gittiği okul					
Yakınınızdaki hastane veya sağlık ocağı					
Yakınınızdaki tehlikeli madde üreten veya depolayan işyeri veya tesisler					

39. Aşağıda belirtilenlere ne ölçüde katılıyorsunuz?					
	Kesinlikle Katılıyorum 1	***Katılıyorum 2***	***Kararsızım 3***	***Katılmıyorum 4***	***Kesinlikle Katılmıyorum 5***
Oturduğum binanın yapıldığı arsa zemini sağlam.					
Binada inceleme yapılmadı.					
Yapılan incelemelere göre bu bina sağlam.					
Gerekli güçlendirme önlemleri alınırsa, bu bina depreme karşı güvenli hale getirilebilir.					
Depreme karşı güçlendirme yapmanın büyük yararı var.					
Binanın göreceği hasar, tesadüflere bağlıdır.					

40. Oturduğunuz binada, depreme karşı önlem alınması ile ilgili görüşler ve uygulamalar nelerdir?	
❑ Apartman yönetimi ve ortaklarıyla beraber oybirliğiyle binada önlem alınması için karar alındı.	❑ Çoğunluk istemesine rağmen itiraz edenler var.
❑ Çoğunluk istemiyor.	❑ Bu konu hiç gündeme gelmedi.
❑ Başka: ……	❑ Başka: ……

41. Hazırlanmakta olan kanun değişiliği ile oturmakta olduğunuz binada, oybirliği aranmaksızın yapı güçlendirme çalışmaları zorunlu hale getirilirse:					
	Kesinlikle Katılıyorum 1	***Katılıyorum 2***	***Kararsızım 3***	***Katılmıyorum 4***	***Kesinlikle Katılmıyorum 5***
Bu duruma mahkeme yoluyla itiraz edenler çoğunlukta olur.					
Verilen kararlara itirazsz uyarım.					
Bu işlemler için 3-6 ay buradan ayrılmaya razı olabilirim.					
Yapılacak güçlendirme işlemlerinden en ucuz olanını tercih ederim.					
Yapılacak güçlendirme işlemlerinden maliyetin yüksek de olsa en güvenli olanını tercih ederim.					
Bu zorlama karşısında taşınmazımı satıp başka bir yere taşınmayı düşünürüm.					
Bu zorlama karşılığında en az 10 yıl taşınmaz vergilerinden muaflık getirilmeli.					

42. Oturduğunuz binada, depreme karşı önlem alındı mı?	
❑ **EVET** (**42A'dan** devam ediniz.)	❑ **HAYIR** (**42B'den** devam ediniz.)

42A - Alınan Yapısal Önlem

1. Oturduğunuz binada depreme karşı hangi önlemleri aldınız?	
❑ Binanın hasar görme olasılığı inceletildi- bir uzmana danışıldı.	❑ Güçlendirme ruhsatı alındı.
❑ Güvenlik ve güçlendirme projesi yaptırıldı.	❑ Zemin ve temeller güçlendirildi.
❑ Taşıyıcı sistem güçlendirildi.	❑ Başka: ……

2. Yapısal önlemlerin tamamının maliyeti ve sizin payınız nedir?	
Tamamının Maliyeti: Yaklaşık……TL	**Sizin Payınız:** Yaklaşık ……TL

3. Yapısal önlemleri almanızda, aşağıda yer alan ifadelerin en etkili İKİSİNİ işaretleyiniz:	
❑ Deprem olasılığı yüksek	❑ Alınan önlemlerin yararı maliyetinden daha fazla
❑ Devlet artık deprem zararlarını karşılamıyor.	❑ Önlemler, gelecek için iyi bir yatırım
❑ Taşınmazın değerinin korunması ve artması	❑ Komşular ve yöneticinin teşvik etmesi
❑ Binanın bulunduğu arsa zemini güven vermiyor.	❑ Akrabalarımın teşvik etmesi
❑ Bina sağlamlık açısından güven vermiyor.	❑ Ev halkının can güvenliği sağlama endişesi
❑ Bilim adamlarının tespit ve açıklamaları	❑ Başka: ……

4. Alınan önlemleri yeterli buluyor musunuz?	
❑ **HAYIR** ***(Lütfen 42B'yi cevaplayınız)***	❑ **EVET** ***(Lütfen 42C'ye geçiniz.)***

42B – Önlem Almama ya da Alınan Önlemi Yetersiz Bulma

1. Aşağıdaki ifadelere ne derece katıldığınızı belirtiniz. (Her satırı ayrı yanıtlayınız.)					
	Kesinlikle Katılıyorum 1	*Katılıyorum 2*	*Kararsızım 3*	*Katılmıyorum 4*	*Kesinlikle Katılmıyorum 5*
Güçlendirme kararına komşular katılmıyor.					
Güçlendirme kararı aldık ama yeterli paramız yok.					
Yapı sağlam, bina güvenli. Önlem alınmasına gerek yok.					
İnceleme ve proje yapılması kararına katılırım.					
Binada yapısal önlem alınması kararına, komşular istemese de katılırım.					
Deprem olacağını sanmıyorum.					
Konutum zarar görmez.					
Konuttan taşınmayı düşünüyorum.					
Bu önlemlerin maliyetini bilmiyorum.					
Yapı güçlendirme işleri pahalı.					
Arkadaş ve akraba çevremde yaptıran pek yok.					
Ne yapacağımı bilmiyorum.					
Vaktim olmadı.					
Alınması gereken önlemler hakkında bilgi sahibi değilim.					
Başka: ……					

2. Aşağıdakilerden hangilerini yakın gelecekte yapmak istiyorsunuz? (Her satırı ayrı yanıtlayınız.)					
	Mutlaka İstiyorum 1	*İstiyorum 2*	*Belki 3*	*İstemiyorum 4*	*Hiç İstemiyorum 5*
İlgili bilim ve meslek adamlarının görüşlerini almak.					
Yapı ve zeminle ilgili teknik ve maliyet araştırması yaptırmak.					
Binadaki komşularla yapısal güvenlik için görüşmek.					
Çevre binalardaki komşuların yaptıklarını öğrenmek.					
Daha önce uygulama yaptıranlardan bilgi almak.					
Güçlendirme projesi yaptırmak için komşuları ikna etmeye çalışmak.					
Müteahhitlerle görüşmek.					
Komşulardan ümit kestiğim için en kısa zamanda binadan taşınmak.					
Başka:					

Lütfen Devam Ediniz:

42 C - Konutta Alınan Önlem ve Geleceğe İlişkin Planlar

Kendi konutunuzda depreme karşı hangi hazırlıkları yaptınız ya da yapmak istiyorsunuz? (Her satırı ayrı yanıtlayınız.)					
	Yaptım 1	*Yakın zamanda yapmayı düşünüyorum 2*	*Belki yaparım 2*	*Şu anda gerekli görmüyorum 3*	*Hiç gerekli görmüyorum 4*
Büyük eşyaları sabitlemek.					
Yangın söndürücü almak.					
Tehlikeli malzemeleri güvenli yere almak.					
İlk Yardım çantası hazırlamak.					
Su ve yiyecek yedeklemek.					
Özel araç gereç satın almak.					
Acil durum / ilk yardım eğitimi almak.					
Kendimi ve yakınlarımı kurtarmak için, deprem anında ne yapılacağını öğrenmek.					
Arama kurtarma işlerinde çalışmak için gerekenleri öğrenmek.					
Aile içinde acil durum planı yapmak.					
Apartmanda veya mahallede afetlere yönelik çalışmalara katılmak					
Hiçbirşey yapmadım.					
Başka: …….....					

Lütfen Devam Ediniz:

43. Sizi ve ailenizi olası bir depremin zararından korumada aşağıdaki kişi ve kurumlardan, hangilerinin "sorumluluk"ları vardır? (Her satırı ayrı yanıtlayınız.)					
	Hiç Sorumlu Değil 1	*Sorumlu Değil 2*	*Belki 3*	*Sorumlu 4*	*Tam Sorumlu 5*
Mahalle Muhtarı					
İlçe Belediyesi					
İstanbul Büyükşehir Belediyesi					
Merkezi Yönetim (Hükümet)					
Yapı Denetim Firmaları					
DASK					
Üniversiteler					
Basın Kuruluşları					
Mimar ve mühendisler					
Müteahhitler					
Kendiniz					
Başka: ……					

44. Binanızın güçlendirilmesi sırasında, evinizi boşaltmanız ve geçici olarak başka bir yere taşınmanız gerekirse, aşağıdakilerden hangisi katlanmaya değer? Yalnız 1 tanesini işaretleyiniz:				
❑ Hiçbirşey karşılık verilmese de.	❑ Binanın güçlendirildiğine dair bir sertifika verilirse.	❑ Zorunlu Deprem Sigortasında prim indirimi yapılırsa.	❑ 5 yıllık emlak vergisi indirimi yapılırsa.	❑ % 50 kira yardımı verilirse.

45. Aşağıdaki kamuya ait ve özel binalardan öncelikli olarak güçlendirilmesi *gereken 3 tanesini* işaretleyiniz:			
❑ Hastaneler	❑ Köprüler ve Alt Geçitler	❑ Kamusal Alanlar	❑ Polis Karakolları
❑ Barajlar	❑ Tehlikeli Atık Depolanan Binalar	❑ Çok Katlı Binalar	❑ Elektrik Şebekesi
❑ İtfaiye	❑ Doğalgaz Şebekesi ve Boruları	❑ İletişim Sistemleri	❑ Camiler
❑ Okullar	❑ Ticaret ve Ofis Binaları	❑ Diğer Kamu Binaları	❑ Tarihi Binalar
❑ Stadyumlar	❑ Başka: ……	❑ Başka: ……	❑ Başka: ……

46. Bir deprem sonrasında, evinizde hasar meydana gelirse, nereye başvuracağınızı biliyor musunuz?	
❑ HAYIR	❑ EVET (Açıklayınız: .....)

47. Oturduğunuz binada, deprem risk ve zarar azaltma çalışmalarının yapılması için, aşağıdaki kurum veya kuruluşların teknik ve kurumsal yeterliliğine göre 3 tanesini işaretleyiniz?				
	Teknik Yeterlilik			***Kurumsal Güvenirlik***
Serbest Mimar ve Mühendisler			Serbest Mimar ve Mühendisler	
Müteahhitler			Müteahhitler	
Yapı Denetim Firmaları			Yapı Denetim Firmaları	
Gönüllü Kuruluşlar- sivil toplum örgütleri			Gönüllü Kuruluşlar- sivil toplum örgütleri	
Doğal Afet Sigortalar Kurumu (DASK)			Doğal Afet Sigortalar Kurumu (DASK)	
Üniversiteler			Üniversiteler	
İlçe Belediyesi			İlçe Belediyesi	
İstanbul Büyükşehir Belediyesi			İstanbul Büyükşehir Belediyesi	
Bayındırlık ve İskan Bakanlığı			Bayındırlık ve İskan Bakanlığı	
Başka:……			Başka:……	

48. Bir deprem sonrasında, konutunuzda hasar meydana gelirse, hasarın giderilmesinde kimler katkı sağlamalıdır? 3 tane seçiniz:	
❑Devlet (Merkezi Yönetim)	❑Yapı Denetim Firmaları
❑İstanbul Büyükşehir Belediyesi	❑Müteahhitler
❑İlçe Belediyeleri	❑Mimarlar ve Mühendisler
❑Mülk Sahipleri	❑DASK
❑Kiracılar	❑Bilim Adamları
❑Başka: ……	Başka: ……

49. Bir deprem olursa, devlet kimlere konut için yardım yapmalıdır? (Her satırı ayrı yanıtlayınız.)					
	Kesinlikle Katılıyorum 1	***Katılıyorum 2***	***Kararsızım 3***	***Katılmıyorum 4***	***Kesinlikle Katılmıyorum 5***
Sadece deprem sigortası yaptırmış olanlara konut için yardım yapılmalı.					
Deprem sigortası yaptırmamış olanlar da dahil olmak üzere, tüm depremzedelere konut için yardım yapılmalı.					
Deprem sigortası yaptırmamış olanlara konut için daha az yardım yapılmalı.					
Kaçak konut sahipleri de dahil, herkese konut için yardım yapılmalı.					
Kaçak konut sahiplerine konut için daha az yardım yapılmalı. (Konutun maliyetinin ¼'ü kadar gibi.)					
Kaçak konut sahiplerine, konut için yardımı yapılmamalı.					
Kiracılara da konut yardımı (kira yardımı gibi) yapılmalı.					
Başka: ……					

Genel Hayat Görüşü ile İlgili Sorular:

50. Aşağıda verilen farklı görüşlere ilişkin ifadelere ne kadar katıldığınız belirtiniz. (Her satırı ayrı yanıtlayınız.)					
	Kesinlikle Katılıyorum 1	*Katılıyorum 2*	*Kararsızım 3*	*Katılmıyorum 4*	*Kesinlikle Katılmıyorum 5*
Günümüzdeki gençler daha disiplinli olmalıdır.					
Askerlik hizmeti çok gereklidir.					
Doğru ve yanlışı ayırt etmeyen insanlarla görüşmemeyi tercih ederim.					
Aile geleneklerinin devam ettirilmesi büyük önem taşır.					
Adil bir düzende, yetenekli insanlar daha çok kazanmalı ve yükselmelidir.					
Kalkınıp zengin olmasını becerenlerin, hayatın keyfini çıkarmaya da hakları vardır.					
Para kazanmak, sıkı çalışmak için en önemli nedendir.					
Devlet, ekonomiye mümkün olduğunca az müdahale etmelidir.					
Ülkedeki insanlara daha eşit davranılırsa, daha az sorunumuz olur.					
Hükümet herkese iyi bir yaşam standardı sağlamakla yükümlü olmalıdır.					
Kötü durumdaki insanlara yardım etmek için düzenlenecek ek vergileri desteklerim.					
Ülkeler arasında eşit bir refah dağılımı olsaydı, dünya daha barış içinde bir yer olurdu.					
İnsanların ilgi ve yararı için yapılanlar, genellikle uzun vadede hep zarar getirir.					
Başka insanlarla işbirliği yapmak nadiren işe yarar.					
Gelecek, bir insanın ciddi planlar yapmasına engel olacak kadar çok sayıda belirsizlik taşır.					
Hayat, bence bir şans oyunu gibidir.					
Hayatımda meydana gelen olaylar üzerinde kontrol sahibiyimdir.					
Kendimi oturduğum bina, çevre ya da mahalleye ait hissediyorum.					
Oturduğum semtin sorunlarının çözülmesi ile ilgili oluşumlara katılırım.					
Günlük hayatta, sosyal ortamlarda ve arkadaş çevremde deprem tehlikesi ve depreme hazırlıkla le ilgili konuşuluyor.					

APPENDIX G

QUESTIONNAIRE DATABASE

Table G.1. Database of Questionnaire

NO	BUILD_ID	HH_NO2	INSURED	NEIGHBOUR	V1_1	V1_2	V1_3	V1_4	V1_5	V1_6	V1_7	V1_8	V1_9	V1_10	V1_11	V1_12	V1_13	V1_14	V1_15	V1_16
1	126008201	9	1	1	2	37	1	5	1	37	1	3	3			5	3	3	2	
2	126006110	13	1	1	2	49	1	2	1	46	1	1				3	3			
3	126006932	4	1	1	1	43	1	3	2	43	1	4	3	1		6	3	3	2	
4	126006850	14	1	1	1	75	0	2				1				2	2	1		
5	126006022	1	2	1	2	50	2	1	1	48	1	1	1			3	3	3		
6	126007930	7	1	1	2	44	3	1	1	37	3	1				3	3	1	2	
7	126007930	7	1	1	2	66	1	1	1	62	1	2				4	3			
8	126008201	9	1	1	2	56	1	1	1	53		1				3	3	3	2	
9	126006054	24	1	1	2	35	1	1	1	31	1	2	1	1		4	3	3	2	
10	126006054	24	1	1	2	42	3	3	1	42	1	4	3			6	3	3	2	
11	126005621	12	2	1	2	46	2	1	1	43	1	2	1			4	3	3	2	
12	126006804	17	1	1	2	31	3	3	1	26	2	2	1	1		4	3	3	2	
13	126007229	16	1	1	2	50	5	3	1	50	3	2				4	3	3		
14	126005462	42	2	1	2	52	1	1	1	41	1	4				6	3	3	2	
15	126003774	28	1	1	2	49	1	2	1	49	1	1				3	3		2	
16	126003574	29	1	1	2	59	1	2	1	51	1	1				3	3			
17	126005462	42	1	1	2	47	1	2	1	47	1	2	2			4	3		2	
18	126016410	44	2	1	2	54	0	5	1	48	0	6				8	3	3	2	
19	126003564	30	1	1	2	38	1	1	1	41	3	2	2			4	3	3		
20	126004816	33	1	1	2	46	1	1	1	43	1	2	2			4	3	3	2	
21	126005236	35	1	1	2	44	3	4	1	41	2	2				4	3	3	2	
22	126001573	2	1	4	2	39	2	3	1	35	1	2				4	3	3	2	
23	126001512	16	2	4	2	46	0	5	1	37		5	2			7	3	3	2	
24	126001668	10	1	4	2	53	1	2	1	40	1	2	2		1	5	4		2	1
25	126001512	16	1	4	2	48	3	3	1	48	3	2	3			5	4	3		
26	126001428	18	1	4	2	48	5	3	1	44	3	1	1			3	3	3	2	
27	126001437	20	1	4	2	58	.					1			1	4	4			
28	126014701	42	1	7	2	43	5	3	1	43	5	2	2			4	3	3	3	
29	126012457	85	2	7	2	32	1	1	1	25	1	1		1		3	3	3	2	
30	126015532	13	1	7	1	61	1	2				1				2	2	2		
31	126012300	84	1	7	2	52	4	3	1	51	2	1				3	3	3	2	
32	126015236	89	1	7	2	51	1	1	1	46	1	3	2			6	3		2	
33	126015236	89	1	7	2	39	3	4	1	36	1	2		1		4	3	3	2	
34	126013122	88	1	7	2	53	1	2	1	53	1					2	3		2	
35	126012734	75	2	7	2	34	1	4								1	1	3		
36	126005437	2	1	2	2	50	3	3	1	46	2	2	1			4	3		2	
37	126012448	83	1	7	2	29	1	1	1	19	3					2	3	3	2	
38	126011984	80	1	7	2	49	5	3	1	46	5	2	2			4	3			
39	126011984	82	1	7	2	44	3	5				3	2		1	5	4	3		
40	126011053	81	1	7	2	46	1	4	1	43	1	1	1			4	3	3	2	
41	126015207	35	1	7	2	55	1	1	1	55	1	2				4	3			
42	126014877	45	1	7	1	60	3	1	2	57	2	1				3	4			
43	126014701	42	1	7	2	49	5	3	1	38	2	3	3			5	3	3	2	
44	126012344	90	1	7	1	34	5	3								1	1	3		
45	126012679	92	2	7	2	52	5	3	1	53	3	2				4	3		2	
46	126012344	90	1	7	2	42	3	3	1	40	5	1	1			3	3	3	2	
47	126012895	53	2	7	2		.		1			3				5	3			
48	126014168	43	1	7	2	55	3	1	1	50	3	1			1	4	4		2	
49	126015730	22	2	7	2	32	1	4	1	21	2	1		1		3	3	3	2	
50	126015730	22	2	7	2	73	1	2	1	59	1					2	3			
51	126015327	27	1	7	1		.	2								1	1			
52	126015333	29	1	7	2	42	1	1	1	36	1	3	2			5	3	3	2	
53	126018492	28	2	7	2	58	1	2								1	1			
54	126015327	27	2	7	1	76	1	1								1	1	3		
55	126015651	30	2	7	2	62	1	2	1	57	1	1	1			3	3		2	
56	126015477	34	1	7	2	43	2	1								1	1	3		
57	126015124	38	2	7	2	60	1	1	1	53	1	4	2			6	3		2	
58	126013242	86	1	7	2	45	1	2	1	43	1	2	2			4	3			
59	126012448	83	2	7	2	49	1	1	1	45	1	2	1			4	3		2	
60	126012300	84	1	7	1		1									1	1			
61	126013579	67	1	7	2		.									2	2			
62	126014699	61	2	7	2	47	3	5	1	40	1	2	2			4	3	3	2	
63	126015651	30	1	7	2	49	2	2	1	55	1	2				4	3			
64	103004388	1	1	7	2	57	5	3	1	53	5	2	1			4	3	3	3	
65	103005297	2	1	7	2	43	7	3	1	42	7	2	1	1		4	3	3	3	
66	126015651	30	1	7	2	52	3	4	1	51	3	1				3	3	3	2	
67	126014699	61	1	7	2	65	1	6	1	63	1					2	3			
68	103004630	3	1	7	2	66	1	7	1	53	1	1	1			3	3	3		
69	126015236	32	2	7	2	54	2	2	1	48	1	1				3	3			
70	103005087	4	2	7	2	43	3	5	1	37	3	1		1		3	3	3	2	
71	126012633	78	1	7	2	59	2	7				1				2	2		3	
72	103004876	5	1	7	2	48	3	4	1	36	3	2				4	3	3	2	
73	126014305	41	1	7	1	76	1	2								1	2	2		
74	126006267	6	2	2	2	50	1	1	1	45	1	2	1			4	3	3	2	
75	126015748	4	1	5	2	66	4	7	1	40						3	4	3	2	
76	126015754	6	1	5	1	65	5	3				1	1			2	2			
77	126014900	9	2	5	2	45	2	5	1							2	3			
78	126015749	24	1	5	2	52	2	4	1	49	1	1				3	3	3	2	
79	126015116	2	1	5	1	53	1	2				1	1			3	2	2		
80	126015148	7	1	5	2	38	1	3	1	24	1	3	2	1		5	3	3	2	
81	126015148	7	1	5	2		.	1	1			3		1		5	3	3		
82	126015148	7	1	5	2		.	1	1			3	1	1		5	3	3	2	
83	126015148	7	1	5	2	32	1	1	1	29		2				4	3	3		
84	126015116	2	1	5	2	45	2	1	1	42	1	3				5	3	3	2	
85	126014670	31	1	5	1	75	.					1				2	2			
86	126014457	29	1	5	1	84	1	2				1				2	2		3	
87	126013155	40	1	5	2	58	1	2				2				3	2	2		
88	126012980	10	1	10	2	50	1	1	1	46	1	3	2			5	3	1		
89	126013411	13	1	10	2	50	1	1	1	45	1	4	2			6	3	3	2	
90	126014121	19	2	10	1	23	2	5	2	32	3	1		1		3	3	3	3	
91	126012827	24	1	10	2	75	2	2	1	68	1	5	1			7	3		2	
92	126010500	6	1	3	2	52	5	3								1	1	3		
93	126010471	17	2	3	2	56	1	2	1	49	1	2				4	3		2	
94	126011110	11	1	3	2	33	4	4	1	31	3					2	3	3	2	
95	126010112	26	2	3	1	52	2	2		52	1	2	1			3	4			
96	126010653	19	1	3	2	40	4	3	1	34	1	3	3		1	6	4	3	2	1
97	126010919	18	2	3	2	62	1	2	1	54	1	1	1			3	3			
98	126011835	3	1	3	2	38	1	1	1	35	3	2	2		1	5	4	3	2	
99	126010290	28	1	3	2	51	2	2	1	48	1	2	1			4	3			
100	126010500	6	1	3	2	40	5	6	1	39	1	2	1	1		4	3	3	2	
101	126013134	6	1	10	2	45	1	5	1	44	1	2	1			4	3	3	2	
102	126013517	7	1	10	2	38	1	7	1	33	2	2	2			5	4	3	2	

Table G.1. Continues

NO	BUILD_ID	HH_NO2	INSURED	NEIGHBOUR	V1_1	V1_2	V1_3	V1_4	V1_5	V1_6	V1_7	V1_8	V1_9	V1_10	V1_11	V1_12	V1_13	V1_14	V1_15	V1_16
103	126011738	41	2	3	2	49	1	1	1	44	1	2	1	1		4	3	3		4
104	126009877	14	2	9	2	42	3		1	38	2	2				3				3
105	126009047	5	1	9	2	31	1	5	1	26	1	2		2		4	3	3	2	
106	126012209	44	2	3	2	50	1	1	1	41	1	2	1			4	3	3	2	
107	126011491	47	1	3	2	40	3	1	1	37	3	1	1			3	3	3	2	
108	126011752	53	1	3	2	38	2	6	1	35		4	3	1		6	3	3	2	
109	126011095	38	1	3	1	56	.		2							2	3			
110	126011971	1	1	3	2	55	2	1	1	47	1	1				4	4		3	
111	126010857	12	2	3	2	37	1	4	1	37	1	3	3			5	3	3	3	
112	126010389	40	1	9	2	25	3	1	1	25	3	2		1		4	3	3	2	
113	126009634	19	1	9	2	48	1	4	1	42	1	4	3			6	3	3	2	
114	126009856	18	1	9	2	67	1	1	1	65	1	1				3	3			
115	126009856	18	1	9	2	62	1	2				1	1			3	4			
116	103000931	2	2	9	2	51	1	2	1	44	1					2	3		3	
117	126009349	15	2	9	1	62	1	2				1	1			2	2	2		
118	126009503	17	1	9	2	49	3	4	1	43	3	2	2			4	3	3	2	
119	126010234	21	1	9	2	47	1	4								1	2	3		
120	126009634	19	1	9	2	48	2	2	1	47	1	4	2	1		6	3		2	
121	126009584	16	1	9	2	62	1	2	1	58	1	2				4	3		2	
122	126003137	59	2	8	2	28	3	1	1	25	3	1				4	4	3	2	
123	126006634	53	2	8	2	45	2	1	1	44	2	1	1			3	3	3		
124	126006634	53	1	8	2	55	2	4	1	48	2	2				4	3	3	2	
125	126007750	31	1	8	1	53	1	2								1	1	2		
126	126007542	37	1	8	2	40	5	3	1	40	5	2			1	5	4	3	3	
127	126007542	37	1	8	2	48	5	3	1	43	3	1	1			3	3	3		
128	126006511	44	2	8	2	55	1	1	1	46	1	3				5	3	3	2	
129	126005603	49	1	8	2	46	1	1	1	42	1	3	1			5	3	3	2	
130	126006691	32	1	8	2	57	1	2				3				4	3	2		
131	126006691	32	2	8	2	43	3	1	1	34	1	3	2	1		5	3	3	2	
132	126008661	27	1	8	1	59	1	1				1				2	2			
133	126008513	24	1	8	2	49	3	1	1	41	1	3	3			5	3	3	2	
134	126008661	27	1	8	2	46	1	2	1	45	1	2	2			4	3		2	
135	126009100	12	1	8	2	34	5		1	30	3	2		2		5	4			
136	126008661	27	1	8	2	52	2		1	45	1	2	2			4	3		2	
137	126008834	28	1	8	2	56	1	6	1	50	1	1				3	3	3	2	
138	126008834	28	1	8	2	52	2	4	1	51	2	1	1			3	3	2	2	
139	126008115	22	2	8	1	47	1	2				1				2	2			
140	126009555	5	1	8	2	44	1	5				2	2			3	2	3		
141	126006079	42	1	8	1	40	5	6	2							2	3	3		
142	126006079	42	1	8	1	74	2	2				1				2	2			
143	126008632	16	1	8	2		.		1			1				3	3		2	
144	126008769	14	1	8	2	69	1	2	1	60	1	1				2	3		2	
145	126008843	11	1	8	2	43	1	1	1	46	1	4	4			6	3	3	2	
146	126013199	69	1	7	2		.	5				2				3	2	3		
147	126013502	72	1	7	2	68	1	2	1	61	1	1				3	3		2	
148	126013055	48	2	5	2	45	1	4	1		1	3	2	1		5	3	3	2	
149	126013132	41	1	5	2	50	5	3	1	48	3	3	2			5	3		2	
150	126014089	45	2	5	2	35	4	6	1	35	1	3	5			6	4	3	2	
151	126012427	15	1	11	2	50	5	3	1	51	1					2	3	3	2	
152	126016463	18	1	11	2	69	1	1	1	56	1	1				2	3		2	
153	126009741	38	2	9	2	38	1	1	1	32	1	2	1	1	1	5	4	3	2	
154	126010134	36	1	9	2	38	3	4	1	36	2	3	2			5	3	3	2	
155	126009634	19	1	9	2	50	1	4	1	45	1	2				4	3	3	2	
156	126012507	79	1	7	2	65	1	2	1							2	3			
157	126013700	87	1	7	2	43	3	2				3				4	2	2	4	
158	126015236	89	1	7	2	41	2	1	1	37	2	2				4	3	3	3	
159	126015537	31	2	7	2	46	1	4				2				3	2	3		
160	126009741	38	1	9	2	54	5	6	1	46	5	1		1		3	3		3	
161	126010243	42	2	9	2	57	1	2	1	53	1	3				5	3		2	
162	126006150	23	1	1	1	44	2	1	1	39	1	2	1			4	4	3	2	
163	126001127	39	1	4	2	36	1	4	1	25	1	2		2		4	3	3	2	
164	126016244	43	1	4	2	24	3	1								1	1	3		
165	126011808	25	1	11	2	47	2	2	1	40	1	3	3			5	3		2	
166	126011282	27	2	11	2	37	1	4	1	33	1	2				4	3	3	3	
167	126009334	26	2	9	2	32	2	1								2	4	3		
168	126015525	3	1	5	2	62	1	2	1	52	2	4	1			6	3		2	
169	126005722	8	1	2	2	59	1	1	1	45	1	3				5	3	3	2	
170	126003548	27	1	1	2	33	3	3	1	33	3	1		1		3	3	3	3	
171	126010857	12	2	3	1	46	1	2				2	1			3	2	2		
172	126006099	40	2	1	2	46	1	1	1			4				6	3	3		
173	126009979	18	1	2	2	47	3	1	1	41	3					2	3	3	2	
174	126009041	38	1	8	2	78	1	2	1	69	1	3	1	1		6	4		2	
175	126008881	44	1	8	2	53	1	2	1	48	1	2	1			4	3		2	
176	126009500	9	1	8	2	36	1	1	1	37	2	1	1			3	3	3	2	
177	126008963	58	1	8	2	45	1	1	1	41	1	2	2			4	3	3	2	
178	126008761	53	1	8	2	35	2	4	1	30	3	3		3		5	3	3	3	
179	126009384	16	1	8	2	36	2	3	1	27	3	1		1		3	3	3	2	
180	126011172	5	1	3	2	45	3	6	1	43	3	2	2			4	3	3	2	
181	126010861	3	1	3	2	34	5	3	1	36	5	1	1			3	3	3	3	
182	126010861	3	1	3	2	42	2	1								1	1	3		
183	126014928	26	1	7	2	44	3	4	1	37	1	3	3			5	3	3	2	
184	126013813	25	1	7	2	58	5	3								3	4			
185	126015738	51	1	7	2	56	3	2	1	52	1	1	1			3	3		2	
186	126015661	38	1	7	1	69	1	1				1	1			5	4			
187	126016385	6	1	1	2	74	1	1	1	74	1	1				3	3	3	2	
188	126013455	7	1	10	2	50	2		1	50	1	2				4	3			
189	126011448	1	1	10	2	45	1	4	1	43	1	1	1			3	3	3	2	
190	126001003	18	1	4	2	70	5	3	1	63	3	1				3	3		2	
191	126001003	2	1	4	2	38	5	3	1	33	5	1	1			3	3	3	3	
192	126005722	8	1	2	2	37	3	3								1	1	3		
193	126011687	14	1	11	2	50	1	1								1	1	3		
194	126010643	9	1	11	2	38	5	4	1	31		3				5	3	3		
195	126016693	12	1	1	2	65	1	2	1	65	1				1	3	4			
196	126014306	6	1	7	2	52	2	2								1	1			
197	126014306	7	1	7	2	53	3		1	46	1	2	2			4	3		2	
198	126008834	28	1	8	2	31	3	3	1	22	3	1		1		3	3	3	2	
199	126015034	14	1	5	2	42	3	3	1	35	2	2	2			4	3	3	2	
200	126014900	9	1	5	2	62	1	2	1	60	1	2				4	3		2	
201	126014900	9	2	5	2	47	5	3	1	36	5	1				3	3	3	3	
202	126014573	15	1	5	1	60	1	2								1	1	2	2	
203	126001816	5	1	4	2	40	3	1	1	30	1	2	1	1	1	5	4	3	2	
204	126010389	40	1	9	2	56	3	2	1	55	1	1				3	3		2	
205	126010007	41	1	9	2	38	5	3	1	36	3	2		1		4	3	3	2	
206	126010144	43	1	9	2	43	3	6	1	30	1	2	1			4	3	3	2	
207	126010243	42	1	9	2	63	1	1	1	60	1					2	3		2	

Table G.1. Continues

NO	V1_17	V1_18	V2_1	V2_2	V2_3	V2_4	V2_5	V3	V4_1	V4_2	V4_3	V4_4	V4_5	V4_6	V4_7	V4_8	V4_9	V5	V6_1	V6_2	V6_3	V6_4	V6_5
1			2	2	1	2	2	1	3	3		3	3	3		3		500	105	5	100000	400	2
2			2	1	2	1	2	5	1									250	85	3	75000	450	1
3			2	2	1	1	2	2	3	2	2	2	4	3	3	2	3	500	70	3	60000	500	1
4	1		2	2	1	2	2	5	3		2	2	2	3	3	2	3		50	2	50000	400	1
5			2	1	2	2	2	6							4			2000	55				2
6			2	2	1	2	2	6	3			3	3	3	3				50	3	45000	300	2
7		1	2	1	2	2	2	5	3				3		4			1000	90	3	55000	350	2
8	1		2	1	2	2	2	4	3	1	3	3	1	3	3	1	3	1500	55	3	75000	500	1
9			1	2	2	1	2	4	2	3		3	3	1	2	1	3	100	70	2			3
10			2	1	2	1	2	4	3	4	3	3	3	3	2	1	3	1000	72	3		400	3
11		1	1	2	2	2	2	5	3	3	2	2	3	2	2	1	1	750	110	4	120000	400	2
12			1	2	2	2	2	4	3	3	3	3	3	3	3	3	3	500	110	4	60000	250	2
13	2	1	2	1	2	2	2	3	3	3	1	3	3	3	4	2	3	100	108	4	80000	400	1
14	3		2	1	2	2	2	3	3	2	1	1	2	3	3	4	3	500	70	3	50000	500	1
15			2	1	2	2	2	6	3			1		2					85	3	75000	400	1
16	1		1	2	2	2	2	4	3	3	3	3	3	3	4	3	3		117	3	175000	900	1
17			1	1	2	2	2	4	3	3	1	3	2	3	2	2	3		65	2	30000	300	1
18	6		2	2	1	2	2	5	3	3	4	3	1	2	3	1	3		90	3		450	1
19			1	1	2	2	2	4	3	2	2	3	2	1	2	1	2	100	75	3	55000	350	1
20			1	1	2	2	2	4	4	3	3	3	3	2	3	1	3	100	70	3	55000	400	1
21			2	1	2	2	2																
22			2	2	1	2	2	5	3	2	2	1	2		1	1	3	250	80	3	50000	300	1
23			2	2	1	1	2	5	4	3	3	3	3	4	4	2	3		90	3	80000	400	1
24			2	1	2	2	2	3	3	4	4	3		3	3	4			70	3		400	1
25			2	1	2	2	2	4	3	3	3	3	3	3	3	3	3		50	3	200000	750	1
26			2	2	1	2	2	2	3	3	3		3	3	3	3		500	130	3	150000	800	3
27	2		1	2	2	2	2	3	3	3	3	3	2	3	3	3	3	600	58	3			2
28			2	1	1	2	2	3	3	3	3	3	3	3	1	1	3	1500	160	4	100000	750	1
29			2	2	1	2	2	5	3	2	1	2	2	3	3	2	3	1500	80	3	60000	450	3
30	1	1	2	1	2	2	2	5	3	4	3	3	3	3	4	2	1	200	90	3			1
31	1		1	2	2	2	2	2	3			3	3	3	3	3	3	100	100	3	80000	500	3
32	1		2	1	2	2	2	5	3	3				3				2150	88	3	65000	450	1
33			2	2	1	2	2	4	3	3	2	3	2	3	2	1	3	1000	80	3	70000	400	1
34			2	1	2	2	2	6	3						1				100	3			1
35			2	2	1	2	2	6	3	3	3	2	2	3	2	2	3		100	3		400	1
36	1	1	1	2	2	2	2	3	3	3	1	3	3	4	3	3	4	250	140	4	150000	600	4
37			1	2	2	2	2	1	3	3	3	2	2	2	1	1	3	0	70	3	55000	350	1
38			2	1	2	2	1	3	3	4	3	1	3	1	3	1	3	1000	90	3	90000	500	1
39			2	2	1	2	2	4	3	2	3	1	1	3	3	2	3	150	140	4	100000	600	1
40			2	2	1	1	2	3	4	5	4	3	1	4	3	3	2	2000	100	3	130000	650	1
41	2		1	1	2	2	2																
42	1		2	1	2	2	2																
43			1	2	2	1	2	3		3	3	2	3	3	4	2	3		120	4	150000	150	3
44			1	2	2	1	2	2	3	3	3	3	3	4	3	3	3	1500	110	4	70000	600	1
45	2		1	1	2	2	2	1	3	4	3	3	1	4	3	3	4	500	120	3	80000	400	1
46			1	2	2	2	2	2	3	3	3	3	3	3	3	3	3		120	4	100000	600	1
47			2	1	2	2	2	6	3		3	3		3				1000	70	2	50000	250	3
48	1		2	1	2	1	2	4	3			3	3	1	2	1	1	200	95	3	60000	400	1
49			2	2	1	2	2	7	4	1	3	1	1	2	4	1	3	150	70	3	65000	350	1
50			2	1	2	2	2	4	3			3	3	3	3	3		500	65	3	70000	500	1
51			2	1	2	2	2	4	3	3	3	3	3	3	3	3	3	300	75	2	60000	400	2
52		1	2	2	1	2	2	5	1		1		1	1	1	1	2		88	3	50000		1
53			2	1	2	2	2	7	1									200	70	3	40000	250	1
54			2	1	2	2	2	6	2	1	1	1	1	1	2	1	2	500	73	3	50000	300	2
55			2	1	1	2	2	1	3	4	3	2	2	2	3	2	3	25	90	3	100000	550	3
56			2	1	2	1	2	3	3	3	3	3	3	3	3	3	3	1000	85	3	60000	450	2
57	1		2	1	1	2	2																
58			2	1	2	2	2	3	3	3	3	3	3	3	3	2	3	1000	120	4	110000	700	1
59	1		1	1	2	2	2	5	3	3	2	2	2	3	3	3	1	350	65	3	55000	400	1
60			2	1	2	2	2	6	2			2	2	2	2	2	2	100	105	3	80000	500	1
61			2	1	2	2	2																
62			1	2	2	1	2	4	3	3	2	3	2	3	3	2	3		90	3		500	1
63	2		2	1	2	1	2	4	3	1	2		2	2	3	2	2	1000	125	4	150000	1000	1
64	1		2	1	1	2	2	2	3	4	1	1	3	3	2	4	3	1000	120	4	200000	1000	1
65			1	1	2	2	2	1	3	5	3	3	3	4	3	3	4	1000	120	4	200000	1000	1
66	1		2	1	1	2	2	3	3			3	2	3	2	3			110	3	170000	850	4
67			2	1	2	2	2	4	3	1	3	3	2	3	3	3	3	1000	90	3	80000	500	1
68			2	1	1	2	2	3	3	3			3	3	3	3	3	2000	130	4	120000	1000	1
69			2	1	2	2	2	4	3	3	3	3	1	3	3	3	3		120	3	120000	600	1
70			2	2	1	2	2	3	5	5	1	2	1	2	3	2	4		125	3	30000	700	2
71	1		1	1	2	2	2	4	2	3	1	1	1	2	2	1	1	500	70	3	40000	350	1
72			2	2	1	2	2	2	4	3	3	3	2	4	3	3	3		130	4	170000	1000	1
73			2	1	2	2	2																
74	1		2	1	1	2	2	3	3	2	3	3		2	3	1	3	500	75	3	90000	400	1
75			1	2	1	2	2	3	2	2	2	1	2	2	2	3	3	900	120	3	150000	1000	1
76			2	1	2	2	2	5	1	1								200	84	2		500	1
77			2	2	1	2	2	4	3	3	2	2	1	3	3	1	3		80	3		500	1
78	1		2	1	1	2	2	3	3	2	3	3	3	3	3	2	3	750	80	3	70000	600	1
79	1		2	1	2	2	2	6	3			2		3		1		750	80	2	60000	350	4
80			2	2	1	2	2	2	3									2000		3	80000		1
81			2	1	2	2	2	6	3	3	3	3	3	3	3	3	3	2000		3	80000		1
82	2		2	1	2	2	2	6	3	3	3	3	3	3	3	3	3	2000		3	80000		1
83			2	1	2	2	2	6	3	3	3	3	3	3	3	3	3	2000		3	80000		1
84																							
85			2	1	2	2	2	2	1			1	1	1	3	1	1	200	75	3	60000	400	4
86	1		1	1	2	2	2	3	3	2	1	3	1	4	3	2	2	200	95	3	120000	600	1
87	2		1	2	2	2	2	3	3		1	2	1	1	3	1	3		85	3	80000	400	2
88			1	1	2	2	2	5	3	3		2		2	2				75	2	50000	350	2
89	1		2	2	1	2	2	6	3	3	3		2	3		3		600	100	4	80000	400	1
90			1	2	2	2	2	4	3	2	4	3	1	3	3	1	2	300	80	3	70000		
91	3	1	2	1	2	1	2	3	4	3	1	2	1	3	3	1	3	3000	160	5	100000	700	3
92			1	1	2	2	2	3	3	2	4	4	4	2	2	1	5	3000	90	4	140000	1000	1
93	2		1	1	2	2	2	3	3	2	2	3	2	3	4	1	3	1500	90	3	50000	500	1
94			2	2	1	2	2	5	3					3	3			100	90	3	80000	300	1
95			2	1	2	2	2	6	1	1	1	1	1	1	4	1	1			3			1
96			1	1	2	2	2	3	5	4	3		5	3	5	3	3	500	167	4	125000	600	1
97			1	2	2	2	2	4	5	5	1	3	1	2	5	1	5	500	115	3	100000	600	3
98	1		1	2	2	2	2	4	2	3	3	1	3	1	3	1	1	750	95	4		500	1
99	1		2	1	2	1	2	3	3	4	1	1	1	2	2	1	1	500	85	3	110000	600	1
100			2	1	2	2	2	3	4	4		1	2	3	3	2	3		125	3		600	1
101	1		2	2	1	2	2	4	3	3	2	3		4		1	3	1000	75	3	85000	700	1
102	1		1	2	1	2	2	3	4	3		2	1	3	4	3	4			2	50000	500	1
103	1		2	2	1	2	2	5	3	3	1	2	1	3	3	1	3	500	75	3	60000	400	1
104			1	2	2	2	2	2	2	2	1	3	3	3	2	2	3	50	90	3	80000	450	1

Table G.1. Continues

NO	V1_17	V1_18	V2_1	V2_2	V2_3	V2_4	V2_5	V3	V4_1	V4_2	V4_3	V4_4	V4_5	V4_6	V4_7	V4_8	V4_9	V5	V6_1	V6_2	V6_3	V6_4	V6_5
105			2	2	1	2	2	3	2	1		1	1	1	1	1	1	500	75	3	60000	400	1
106	1		2	2	1	2	2	3	5	5	1	3	3	4	4	2	5	50	90	3	80000	450	1
107			1	2	2	2	2	6	2		2	2	2	2	2	2	2		80	3			1
108			2	1	2	2	2	4	4	5				3	4	4		1000	125	4	150000	500	3
109			2	2	1	2	2	6										50	62				2
110	1		1	1	2	2	2	6	3		2	2	2		2	1		0	95	3	100000	600	1
111			2	2	1	2	2	4	3	3	1	2	1	3	3	1	1						
112			2	2	1	2	2	5	2	1	2	2	1	2	2	1	3		95	3	100000	500	2
113	1		2	2	1	2	2	3	2	3	3	3	3	3	5	3	3	0	85	3			
114	1	1	2	1	2	2	2	4	3	1	2	1	2	3	3	1	3	500	60	1		200	4
115			2	1	2	2	2	6	3	2				1				2000	75	3	40000	400	2
116			2	1	1	2	2	5	3		3	3	3	3	3	3		500	78	3	70000	650	1
117			2	1	2	2	2	5	3	3		1	3	3	3	3	3	200	75	3		400	2
118			2	2	1	2	2		3	3			3		3	2	4		85	3	50000	450	1
119			2	1	2	2	2	1	3		3	3	3	3	3	3	3	100	120	4	120000	700	1
120	1		2	1	1	2	2	3	3	4	2	2	1	3	3	2	3		110	4			3
121			2	1	2	2	2	5	3		3	1	2		3	1	1		100	4	100000	500	3
122								6	3	1	3	3	1	3	3	1	3	250	65	3			2
123			1	2	2	2	2	3	3	3	2	2	2	1	3	1	3	800	65	2	50000	350	4
124	1		2	2	1	2	2	6	3				4		4		4	500	120	4	170000	500	2
125								4										500	75	3		500	1
126			2	1	2	2	2	2	3	3	3	3	2	3	3	2		400	65	3	35000	250	1
127			1	1	2	2	2	2	3	3	3	3	3	4	3	2	3		60	3			
128	3		1	1	2	2	2	2	3	1	1	3	3	3	3	2	3	2000	170	6	180000	1000	1
129	1		1	2	2	2	2	5	3	4	3	3	3	3	4	2	3	2500	120	4		1000	1
130			2	1	2	2	2	6	1					1	1	1	1	1000	110	4		800	1
131			2	2	1	2	2	5	3	4	3	3	3	3	3	2	3	500	110	4	80000	500	1
132		1	2	1	2	2	2	5	3	3	2	3	3	4	3	3	3	300	80	3	70000	500	1
133			2	2	1	2	2	3	2	2		2	1	2	2	1		500	85	3	70000	400	1
134			2	1	2	2	2	6	1	1	1	1	1	1	1	1	1			3	90000	600	4
135			2	1	2	2	2		3					3	3			500	95	3	65000	500	1
136			1	2	2	2	2	6	3	3	3	3	3	4	3	2	3	400	75	3	50000	400	1
137		1	2	1	2	2	2	5	2			2		2		2			120	4			1
138			2	1	2	2	2	6	3											3				4
139	1		2	1	2	2	2	6	1	1	1	1	1	1	1	1	1	2300	65	3	90000	400	2
140			2	2	1	2	2	4	3	3	3	2	3	2	3	2	3	1000	55	2			1
141			1	1	2	2	2	4	3	4	3	3	4	5	3	2		200	78	2			2
142		1	1	2	2	2	2	5	3	1	3			2	3	1	1	200	85	3	100000	600	1
143	1		1	1	2	2	2	2	3	2	2	2	3	3	3	2	3						
144			2	1	2	2	2	6	3	1	1	2	1	2	3	1	2						
145			2	2	1	2	2	6	3	3	1	3	3	3	3	1	2						1
146			2	2	1	2	2											200	75	3		400	2
147								3	3	3	3	3	2	3	3	2	3		75	2	60000	500	1
148			2	2	1	2	1	5	4	2	1	2		2	2	2	2						
149			2	1	2	2	2	5										400	75	3	80000	600	4
150			2	1	2	2	2	5	1	1	1	2	1	2	1	1	2	100		3			1
151			2	1	2	2	2	3	3	3		3	3	3	3	4	4			4			2
152			1	2	2	2	2	4	3					3	3		2	100	84	3	65000	500	2
153			1	2	2	2	2	6	3	3	1	1	1	3	4	1	1	5000	90	3	70000	600	1
154			2	2	1	2	2	4	3	3	2	1	1	4	3	1	3	250	65	2	40000	350	1
155	1		2	2	1	2	2	4	3			2	2	3	2			100	120	4	100000	500	1
156			2	1	1	2	2	4	3	1	3	2	1	3	3	3	3	500	120	4		400	2
157			2	1	2	2	2	4	3	4		3		3	5	1	3		85	3		400	1
158			2	2	1	2	2	4	3	3	2	2	1	3	1	1	3	3000	75	2	40000	350	1
159			2	2	1	2	2	3	4	4	3	3	2	3	3	2	4		70	3	40000		1
160			2	1	2	2	2	4	4	2	1	3	4	2	3	1	3	500	50	3	50000	500	1
161	2		1	1	2	2	2	5	3					3	3	1	3						
162	1		1	2	2	2	2	5	3	3	3	2	1	3	4	2	3	500	250	5	200000	600	1
163			2	2	1	2	2	4	4						4			200	85	3	80000	400	1
164			2	1	2	2	2	4	4					3	4		2	0	70	3	75000	350	1
165			2	1	2	2	2	3	3	5		3	3	4	3	3	3		90	3	80000	500	1
166			2	2	1	2	2	5	3	5	3	3	3	2	4	1	1	250	140	4	75000	250	1
167	1								3			3		3	3	3	3			3	60000	400	2
168	1		1	1	2	2	2	4	3	4	3	3	2	2	4	1	3	1100	95	3	60000	350	1
169	3		1	2	2	2	2	4	4	3	2	2	2	4	3	2	3	0	90	3	70000	400	3
170			1	1	2	2	2		3	3	3	3	3	3	3	3	3	100	90	3	80000	500	2
171	1		2	1	2	1	2	4	3	4	4	3	3	3	3	2	2	500	125	3	40000	500	1
172			2	2	1	2	2	2	3	3	3	2	2	3	3	1	4		75	3	85000	300	2
173			1	2	2	2	2	6	3		3	3	3	1	1	1	1	1000	90	3	120000	500	1
174			2	1	1	2	2	4	3	3	3	3	3	2	3	1	1	1500	90	2	65000	350	1
175	1	1	2	1	2	2	2	6	3	4	3	2	4	3	3	1	4	500	80	3	90000	400	1
176			2	2	1	2	2	4	3	3	2	2	3	3	3	1	2	500	90	4	60000	500	3
177			1	2	2	2	2	6	3	4	3		3	2	3	1	2		50	2	80000	350	1
178			2	1	1	2	2	3	5	1	3	3	3	3	4	3	3			3			2
179									3	2	3	4	3	4	3	2	1		75	3	30000	300	2
180			1	2	2	2	1	4	3	4	2	1	2	2	2	2	3	1000	80	3	100000	550	1
181			1	2	1	2	2	4	3	3	3	3	3	4	3	3	3			3	65000	500	4
182			1	2	2	2	2	5							5			500	130	3	150000	1000	1
183			2	2	1	2	2	4	2	5	1	1	2	1	5	1		1250	75	3	85000	750	1
184	2		2	1	2	2	2	5	3									300	70	2		500	1
185			2	1	2	2	2	5	3	3	3	3	3	3	3	2	3		80	3	60000	350	1
186	2		2	1	1	2	2	4	4	3	3	3	3	3	3	2	2	1000	63	3			3
187			2	1	2	2	2	5	3		3	3	3	3	3				120	3	150000	850	1
188			2	2	1	2	2	3	3	3	1	3	1	4	3	2	3		95	3	45000	500	4
189			2	1	2	2	2	4	3	2	1	2	1	3	2	1	3	300	70	3	40000	300	3
190			2	1	2	2	2	4	3	3	3	2	3	3	3	2		200	100	3	85000	450	1
191			1	2	2	2	1	1	3	3	3	4	4	4	4	3	3		110	4	175000	750	1
192			1	2	2	2	2	3	4	2		1	4	2	4	1	4	1000	118	3			1
193			2	2	1	2	2	3	3	2	3	3	2	2	2	3	3	2500	110	4	150000	750	1
194			2	2	1	2	2	3	3	3	3	3	3	3	3	2	3	0	85	3	60000	500	1
195			2	1	2	2	2	5	4	1	2	2	1	3	3	3	3	500	105	3	100000	550	1
196									3					1				1000	140	4	100000	800	1
197			1	2	2	2	2	5	3	3	2			3	3	1	3	1000	120	4	150000	700	2
198			1	2	2	2	2	3	4	3	3	3	2	3	4	2	2						2
199			1	2	2	2	2	5	3	3	2	1	2	2	2	1	2		80	3			2
200	2		1	2	2	2	2	3	3	2	4	2	1	2	3	1	4	650	100	3	100000	800	1
201			1	1	2	2	2	4	3	2	4	2	1	2	3	1	4	500	60	2	50000	300	1
202			2	1	2	2	2	5	3	3	3	3	2	3	3	3	3	400	80	3	55000	400	3
203			1	2	2	1	2	4	3	3	3	3	2		3	1	3	400	80	3	55000	400	3
204	1	1	1	2	2	2	2	5	1		1	1		1			1	450	70	3	55000	450	1
205			1	2	2	2	2	3	2	2	2	2	3	2	2	1	2	200	140	5		750	2
206			1	2	2	2	2		3	4		1	2	3	3	1	5	100	110	3	100000	700	1
207			2	1	2	1	2		3	1		1		1	1		1		105	3	75000	400	1

Table G.1. Continues

NO	V7_1	V7_2	V7_3	V7_4	V7_5	V7_6	V7_7	V7_8	V8	V9	V10_1	V11	V13_1	V13_2	V13_3	V13_4	V13_5	V14_1	V14_2	V14_3	V14_4	V14_5
1	7	15	13	4	1	4	1	2	156		2	12	2		0			2	2	1	2	2
2	5	10	18	2	2		2	2	192		2	10	2		0			2	2	1	2	2
3	4	4	12	2	1	1	1	2	144	60	2	12	1	1	1	2	2	1	1	2	2	2
4	6	6	15	2	1	2	3	2	156		2	9	2		0			2	2	2	2	2
5	4	8	17	2	2		2		204		2	4	2		0							
6	5	5	29	2	1	1	2	2	60		2	16	2		0			2	2	1	1	2
7	5	5	29	2	1	1	2	2	264		2	15	1	1	1	2	2	1	1	1	1	2
8	6	15	13	2	2			2	156		2	13	2		0			2	2	2	1	2
9	4	8	8	2	1	1	2	2	96		2	10	2		0			2	2	1	2	1
10	5	8	10	2	1	2	2	2	108		2	12	2		0			2	2	1	1	1
11	5	10	13	2			2	2	156	300	2	11	2		0			2	2	1	2	2
12	5	4	12	2	2		2	2	144		2	14	1	1	1	1	1	1	1	2	2	2
13	6	5	7	2	1	2	2	2	84		2	11	2		0			2	2	1	2	2
14	5	8		2	1	1	3	2	24		2	8	2		0							
15	5	10	15	2	1	2	2	2	72		2	10	2		0			2	2	1	2	2
16	4	24	10	2	1	6	2	1	120		2	13	1	1	1	1	1	2	1	1	2	1
17	4	8	18	2	1	1	2	2	216	480	2	12	2		0			2	2	2	2	2
18	4	4	15		1	1	2	2	120		2	8	2		0			2	2	1	2	2
19	5	17	16	2	1	3	2	2	144		2	12	2		0			2	2	1	2	2
20	4	10	14	2	2		2	2	168		2	12	2		0			2	2	1	2	2
21									180		2	0			0							
22	4	10	15	2	2		2	2	96		2	9	1	1	1	2	2	1	2	1	2	2
23	5	12			2			2	180		2	11	2		0			2	2	1	2	2
24	4	12	11	2	2		2	2	132		2		2		0			2	2	1	2	2
25	5	10	16	2	1	2	3	2	144		2	17	1	1	1	1	2	1	1	2	2	2
26	4	6	18	2	1	1	2	2	204	240	2	16	1	1	1	1	1	2	1	1	2	2
27	4	5	16	2	2		2	2	168		2	8	2		0			2	2	1	2	2
28	5	16	10	2	1	3	3	2	108		1	17	1	1	1	1	2	1	2	1	2	2
29	5	15	15	2	1	2	2	2	60		2	16	2		0			2	2	1	2	2
30	4	8	10	2	2		2	2	60		2	6	2		0			2	2	1	2	2
31	5	10	8	2	1	1	2	2	96		2	15	1	1	1	1	2	2	2	1	2	2
32	6	18	6	2	0		2	2	72		2	11	2		0			2	2	1	1	2
33	6	18	6	2	2		2	2	72		2	11	2		0			2	2	1	2	2
34	5	8	18	2	1	3	3	2	120		2	6	1	1	1	1	2	2	1	1	2	2
35		14	10					2	96		2	10	1	1	1	2	2	1	2	2	2	2
36	4	8	7	2	1	1	2	2	84	42	1	17	1	1	1	1	1	1	1	1	1	2
37	4	10	12		2		2	2	36	24	1	8	2		0			2	2	1	2	2
38	5	16	15	2	1	3	2	2	180		2	13	1	1	1	1	1	1	1	1	1	2
39	4	8	15	2	1	2	3	2	180	240	2	11	1	1	1	1	2	2	2	1	2	2
40	4	14	12	2	1	3	3	2	72	15	1	14	2		0			2	2	1	2	2
41									180		2	0			0							
42									144		2	0			0							
43	6	16	10	2	1	2	2	2	96		2	15	2		0			2	2	2	2	2
44	5	10	15	2	1	1	2	2	144		1	16	2		0			2	2	1	2	2
45	4	10	8	2	1	3	2	2	96		2	14	1	1	1	2	2	2	2	1	2	2
46	5	10	16	2	1	1	2	2	192			15	1	1	1	1	1	1	2	2	2	2
47	5	5	20	3					240		2	10			0			2	2	2	2	2
48	4	8	17	2	1	3	2	2	204		2	10	2		0							
49	5	20	15	2	1	4	3	2	1		1	9	2		0			2	2	2	2	2
50	5	8	13	2	1	2	2	1	13		2	13	2		0			2	2	1	2	2
51	5	12	15	2	2		2	2	15		2	5	2		0			2	2	1	2	2
52	4	9	9	2	1	1	2	2	62		2	12	1	1	1	2	2	1	1	1	1	2
53	5	10	15	2	2		2	2	360		2	8	2		0			2	2	1	2	2
54	4	12	18	2	1	3	2	2	216		2	5	2		0			2	2	1	2	2
55	4	9	15	2	1	3	2	2	112		2	8	2		0			2	2	1	2	2
56	5	14	10	2	1	1	2	2	96		2	13	1	1	1	1	1	1	2	1	2	2
57									168		2	0			0							
58	5	6	8	2	1	1	2	2	96	120	2	18	2		0			2	2	1	1	1
59	4	10	15		2		2	2	156		2	9	2		0			2	2	1	2	2
60	5	10	8	2	1	1	2	2	96		2	11	2		0			2	2	2	2	2
61									156		2	0			0							
62	4	8	9	2			2	2	96		2	14	2		0			2	2	1	2	2
63	14	60	15	2	2		2	1	96		2	11	1	1	1	2	2	2	2	1	2	2
64	15	60	10	2	2		2	1	120		2	15	1	1	1	1		2	2	1	2	2
65	14	60	10	2	2		3	1	84		2	14	1	1	1	1	1	2	1	1	1	2
66	14	60	10	6	2		1	1	96		2	16	1	1	1	1	2	2	2	1	2	2
67	5	8	8	2	1	3	1	2	96		2	10	2		0			2	2	1	2	2
68	14	60	15	3	2		2	1	48		2	15	2		0			2	2	2	2	2
69	14	56	20	2	1	6	3	1	96		2	16	1		2	2	2	2	2	1	2	2
70	14	60	10	2	1	4	2	1	96		2	14	2		0			2	2	1	1	1
71	5	10	10	2	1	2	2	2	48		1	13	2		0			2	2	1	2	2
72	15	60	10		2		2	1	84		2	16			0			2	2	1	1	2
73									156		2	0			0							
74	5	12	7	2	2		2	2	84	300	2	9	2		0							
75	6	12	24	2	2		2	2	276		2	11	1	1	1	1	1	2	1	1	1	2
76	4	8	35	2	2		2	2	144		2	9	2		0			2	2	2	2	2
77	4	5	15	2	2		2	2	180	48	2	13	1	1	1	2	2	2	2	2	2	1
78	4	5	17	2	2		2	2	204	24	2	15	1	1	1	1		2	1	2	2	2
79	4	12	9	2	1	1	2	2	96		2	6	2		0							
80	7	14	10	2	1	1	2	2	120		2	12	1	1	1	1	1	1	1	1	1	2
81	7	14	10	2	1	1	2	2	120		2	12	1	1	1	1	1	1	1	1	1	2
82	7	14	10	2	1	1	2	2	120		2	12	1	1	1	1	1	1	1	1	1	2
83	7	14	10	2	1	1	2	2	120		2	12	1	1	1	1	1	1	1	1	1	2
84									240		2	0			0							
85	4	8	20	2	1	3	2	2	240	240	2	7	2		0							
86	5	4	16	2	1	1	2	2	192		2	8	2		0			2	2	1	2	2
87	5	10	16	2	2		2	2	144		2	11	2		0			2	2	1	2	2
88	3	4	32	2	2		2	2	384		2	11	1	1	1		2					
89	4	8	7	2	1	2	2	2	84	48	1	14	2		0			2	2	1	2	2
90									18		2	10	2		0			2	2	1	2	2
91	5	7	25		1	1			300		2	13	2		0			2	2	1	2	2
92	4	12	14	2	1	4	2	1	168	360	2	19	1	1	1	1	1	2	1	1	1	2
93	10	10	2	2	1	2	3		48	120	2	12	2		0			2	2	1	2	2
94	4	9	14	2	1	1	2	2	12	120	2	7	1	1	1	1	2	2	2	1	2	2
95	5	11	16	2	1	3	2	2	192		2	11	1	1	1	2	2	2	1	2	2	1
96	5	8	9	2	2		2	2	50	60	2	16	2		0			2	2	2	1	2
97	7	5	11	2	1	1	2	2	132		2	15	2		0			2	2	2	1	2
98	4	8	26	2	2		2	2	96		2	11	2		0			2	2	1	2	2
99	5	8	14	3	1	2	2	1	168		2	16	1	1	1	1	1	2	1	1	1	2
100	5	11	10	2	2		1	1	12		2	12	1	1	1	1	2	1	2	1	2	2
101	4	4	15		1	1	3	2	180	60	2	13	2		0			2	2	1	2	2
102	5	5	16	2	1	1	2	2	156		2	10	1	1	1	2	2	1	2	2	2	2

Table G.1. Continues

NO	V7_1	V7_2	V7_3	V7_4	V7_5	V7_6	V7_7	V7_8	V8	V9	V10_1	V11	V13_1	V13_2	V13_3	V13_4	V13_5	V14_1	V14_2	V14_3	V14_4	V14_5
103	5	5	15	2	2		2	2	180		2	11	2		0			2	2	1	2	2
104	6	11	30	2	2		2	2	36	120	2	10	2		0							
105	5	8		2	2		2	2	60		2	13	2		0			2	2	2	2	2
106	5	5	7	2	1	2	2	2	84		2	18	1	1	1	2	2	1	1	1	1	2
107	6	8	18	2	1	2	2	2	120		2	10	2		0			2	2	1	2	2
108	5	5	8	2	2		2	2	60		2	10	2		0			2	2	1	2	2
109									24		2	3	2		0							
110	6	6	14	2	1	1	2	2	168		1	9			0			2	2	1	2	2
111	4	18	14		1	4	3	2	168		2	13	2		0							
112	4	3	10	2	1	1	2	2	24		2	9	2		0							
113	4	8	30	2	2		3	2	240		2	13	1	1	1	1	1	2	1	1	2	2
114					2		2	2			2	11	2		0			2	2	1	1	2
115	3	10	14	2	2		2	2	168		2	8	2		0			2	2	1	2	2
116	4	8	10	2	1	1	2	2	120	60	2	12	2		0			2	2	1	2	2
117	6	8	7	2	1	3	3	2	84		2	11	2		0			2	2	1	2	2
118	5	8	20	2			2	2	240		2	10			0			2	2	1	2	2
119	3	3	13	3	1	1	2		120		2	13	1	1	1	2	1	1	1	2	2	2
120	4	8	35	2	2		2	2	420		2	9	2		0			2	2	1	2	2
121	5	12	6	2	2		3	2	72		2	10	2		0			2	2	2	2	2
122	5	25	20	1	2		3	2	60		2	8	2		0			2	2	1	2	2
123	4	8	12	2	1	2	2	1	144		2	18	1	1	1	2	2	1	1	1	2	2
124	4	8	12	2	1	2	2	2	144		2	9	2		0			2	2	2	1	2
125	5	5	9	2			2	2	108		2	14	2		0			2	2	1	2	2
126	4	9	17	2	2		2	2	192	60	2	15	1	1	1	1	1	2	1	1	1	2
127	4	9	16	2	1	1	2	2	10		2	15	2		0			2	2	1	1	2
128	3	6	15	2	2		2	2	144		2	14	1	1	1	2	2	2	2	1	1	2
129	4	8	12	2	2		2	2	120		2	12	1	1	1	1		1	1	1	2	2
130	4	10	15	2	2		2	2	168		2	8	2		0			2	2	1	2	2
131	4	10	15	2	2		2	2	96		2	10	1	1	1	2	2	2	1	1	2	1
132	5	9	9	2	1	1	3	2	108		1	13	2		0			2	2	2	2	2
133	5	13	15	2	2		2	2	144		2	15	1	1	1	2	1	1	1	1	2	2
134	6	9	9	2	1	1	1	2	108		2	8	2		0			2	2	1	2	2
135	20	80		2	1	8	2	1	36		2	14	2		0			2	2	1	2	1
136	5	9	9	2	1	1	3	2	108			13	2		0			2	2	2	2	2
137	5	9	20	2	1	3	2	2	228		2	8	2		0							
138	4	9	16	2	1	3	2	2	180		2	12	2		0			2	2	1	2	2
139	4	4	10	2	2		2	2	96	240	2	4	2		0			2	2	1	2	2
140	4	10	16	2	1	1	2	2	60		2	12	2		0			2	2	1	1	2
141	4	4	14	2	1	2			168		2	13	2		0							
142	4	4	14	2	1	2	2	2	168		2	6	2		0							
143												14	1	1	1	1	2	2	1	1	2	2
144	5	8	8	2	1	1	2	2	96		2	11	2		0			2	2	1	2	2
145	5	9	18		2		3	2	108		2	8	1	1	2	1	1	1	2	1	1	2
146									24		2	0			0							
147	5	10	11	2	1	1	2	2	132		2	15	2		0							
148	6	10	10	2	2		2		120		2	12	2		0			2	2	1	2	2
149	4	4					2	2			2	15	2		0			2	2	1	1	2
150	5	10	19	2	2		1	2	216		1	11	2		0			2	2	1	2	2
151	5	11	22	2	1	1	2	2	264		2	12	1	1	1	1	2	2	1	1	1	2
152	5	17	8	2	2		2	2	96		2	10	2		0			2	2	1	2	2
153	4	12	10	3			2	2	72		2	8	2		0			2	2	2	2	2
154	4	4	25	2	2		2	2	228		2	14	2		0							
155	6	9	20	2	2		1	2	60		2	11	1	1	1	2	2	2	2	1	1	2
156	5	11	10	2	2		1	2	120		2	13	1	1	1	2	2	1	2	1	2	2
157	5	10	11	2	2			2	132		2	16	2		0							
158	6	10	12	2	1	2	2	2	133		2	16	2		0							
159	14	41	15	2	2		2	2	60		2	15	2		0			2	2	2	2	1
160	4	12	20	2	3		2	2	96		2	8	1	1	1	1	1	2	1	1	1	2
161	5	10	15	2	2		2	2	180		2	13	2		0			2	2	1	2	2
162	4	10	15	2	2		2	2	24		2	10	2		0			2	2	2	2	2
163	5	10	15		2		2	2	72		2	11	2		0			2	2	2	2	2
164	4	4	15	2	2		3	2	120		2	13	2		0			2	2	2	2	2
165	4	4	24					2	288		2	17	1		0							
166	4	12	10	2	2		2	2	36	360	2	12	2		0			2	2	1	2	2
167	5	8	10	2	1		2	2	108		2	9	2		0							
168	4	8	14	2	1	3	2	2	168	180	2	12	2		0							
169	4	10	12	2	2		2	2	147	60	1	12	2		0			2	2	1	2	2
170	3	10	14	2	2		2	2	192		2	15	2		0			2	2	1	2	2
171	5	18	12	2	2		3	2	24		2	12	2		0			2	2	1	2	2
172	4	4	15	2	2		2	2	48	120	2	11	1	1	2	1	1	2	1	1	2	2
173	5	11	12	2	2		2	2	144		2	8	2		0			2	2	2	1	2
174	3	3	26	2			2	2	312		2	10	2		0			2	2	2	2	2
175	4	4	15	2	2		2	2	180	120	2	9	2		0			2	2	2	2	2
176	5	17	15		2		2	2	120		2	11	2		0			2	2	1	2	2
177	5	6	17	2				2	204		2	12	2		0							
178	5	25	8	2	1	3	2	2	96	120	2	11	2		0			2	2	1	1	1
179	4	20	18		2		3	2	84		1	10	1	1	1	1	2	2	2	1	2	2
180	5	4	16	2	1	1	2	2	192	240	2	16	2		0			2	2	2	1	2
181	5	4	15	2	1	1	2	2	225		2	15	1	1	1	2	2	1	1	1	1	1
182	5	8	28	2	1	2	2	2	72	120	2	9			0			2	2	1	2	2
183	4	8	30	2	1	2	2	2	168		2	12	1	1	1	1	1	2	1	2	2	2
184	3	1	30	2	2		2	2	360		2	13	1	1	1	1	1	2	2	2	2	2
185	4	12	15		0				180		2	11	1	1	1	1		1	1	2	1	1
186	8	15	25	2	1	3	2	2	132		2	11	2		0			2	2	1	2	2
187	3	2	11	2	1	1	2	2	132		2	10	2		0							
188	5	10	25	2	2			2	120		2	15	1	1	1	1	3	1	2	1	2	2
189	4	4	20	2	2		3	2	240		2	14	2		0			2	2	1	2	2
190	19	80	18	2	2		2	1	72		2	13	1	1	1	1	2	2	1	1	1	2
191	5	12	12	2	2		3	1	96		2	13	1	1	1	1	2	1	1	1	1	2
192	5	20	7	2	3		2	2	84	60	2	14	2		0			2	2	1	1	1
193	5	8	12	3	1		3	2	48	24	2	15	1	1	1	1	2	2	2	1	2	2
194	9	36	10	2	2		2	1	96	60	2	16	1	1	1	1	2	2	2	1	2	1
195	4	3	15	2	1	2	2	2	180		2	10	2		0			2	2	1	2	2
196	5	10	13	2	2		2	2	156		2	5	2		0			2	2	1	2	2
197	4	4	19		2		2	2	228		2	8	2		0			2	2	1	2	2
198	4	16	10	2	1	3	3	2	24	72	2	13	1	1	2	1	1	1	2	1	2	2
199	4	108	12	2	2		2	2	144	12	1	13	1	1	1	2	2	1	2	1	1	2
200	7	10	11	2	1	3	2	2	132		2	14	2		0			2	2	2	1	2
201	7	10	11	2	1	3	2	2	132		2	9	2		0							
202	5	13	10	2	1	1	3	2	84		2	12	2		0			2	2	1	2	2
203	5	12	12	2	1	1	2	2	108		2	13	1	1	1	1	2	2	1	1	1	2
204	5	8	15	2	1	2	3	2	120		2	15	2		0			2	2	1	2	2
205	6	20	8	2	1	3	3	2	96		1	16	1	1	1	1	1	1	2	1	2	2
206	5	24	15	2	1	1	2	2	144		2	14	2		0			2	2	1	2	2
207	4	10	15	2	2		2	2	180		2	10	2		0			2	2	2	2	2

Table G.1. Continues

NO	V14_6	V14_7	V14_8	V15_1	V15_2	V15_3	V15_4	V15_5	V15_6	V15_7	V15_8	V16_1	V16_2	V17_1	V17_2	V17_3	V17_4	V17_5	V18	V18A1	V18A2	V18A3
1	2	2	1	1	2	2	1	2	2	2	2	2										
2	2	2	2	1	2	2	1	2	2	2	2	2		1	1	2	2	2	1	1	95	70000
3	2	2	2	1	2	2	2	1	2	1	2	2		2	2	1	2	2	1	5	56	30000
4	2	1	2	1	2	2	1	1	2	2	2	2		2	1	1	2	1	1	5	60	
5				1	2	1	2	2	2	2	2	2		2	1	2	2	2				
6	2	1	1	1	2	2	1	2	2	2	2			1	1	1	2	2	1	2		
7	2	1	1	1	2	2	1	1	1	2	2	2		1	2	2	2	1	1	2		
8	2	1	2	1	2	2	2	1	2	2	2	2		2	2	1	2	2	1	2	31	15000
9	2	2	2	1	2	2	2	2	2	1	2	2		1	2	1	2	2	1	6		
10	2	2	1	1	1	2	1	2	2	2	2			2	1	1	2	2	1	4		
11	2	2	2	2					0	0	0	2		1	2	2	2	2				
12	1	2	2	1	2	2	2	2	1	1	2	2		1	1	1	2	2	1	4	50	
13	2	1	2	1	2	2	2	1	2	2	2	1	2	2	2	1	2	2	1	3	98	
14				2					0	0	0	2		2	2	2	2	2				
15	2	2	2	1	2	2	1	2	2	2	2	2	2	2	1	1	2	2	1	6	87	32300
16	2	2	2	1	2	2	2	1	2	2	2	1	2	1	1	1	2	2	1	1	106	50000
17	1	2	2	1	2	1	2	1	2	2	2	2		1	1	1	2	2	1	7	54	
18	2	2	2	1	2	2	1	2	2	2	2	1		2	2	1	2	2				
19	2	2	2	1	2	2	2	2	2	1	2	2		2	2	1	2	2	1	7	83	32000
20	2	2	2	2								2		1	1	2	2	2	1	5	35	37000
21				1	2	2	1	2	2	2	2	1		1	1	1	2	1	1	1		
22	2	2	2	1	2	2	2	1	2	2	2	2		1	1	1	2	2	1	4	45	
23	2	2	2	2								2		1	2	1	2	1				
24	2	2	1	1	2	2	1	2	2	2	2	1	2	2	2	1	2	2	1	7	80	
25	2	2	2	1	2	2	2	2	2	1	2	2		1	1	1	2	2	1	1		
26	2	2	2	1	2	2	1	1	2	2	2	1	1						1	7	130	
27	2	2	2	1	2	2	2	1	2	2	2	2		1	1	2	2	2	1	1	70	27000
28	2	1	1	1	2	2	2	1	2	2	2	1	1	2	1	1	2	2	1	2	130	51000
29	2	2	2	2								2		1	1	2	2	2				
30	2	1	2	1	2	2	2	2	2	1	2	1	1	2	1	2	2	2	1	5	100	35000
31	2	2	2	1	2	2	2	2	2	1	2	1	2	2	1	1	1	2	1	5	105	43500
32	2	2	2	2								1	2	1	1	1	2	2	1	1		
33	2	1	2	2								2		1	2	1	2	2				
34	2	2	1	1	2	2	1	2	2	2	2	2		2	1	1	2	2	1	7	84	
35	2	2	2	2								2										
36	2	2	1	1	2	2	2	2	2	1	2	2		1	1	1	2	1	1	7	140	80000
37	2	2	2	2								2		1	1	2	2	2	1	1	37	
38	2	2	1	1	2	2	2	1	2	1	1	1	2	2	1	1	2	2	1	6	89	
39	2	2	1	1	1	2	1	2	2	1	2	2		1	1	1	2	2	1	6	30	
40	2	1	1	1	2	2	1	1	1	1	2	2		1	1	1	2	1	1	2		
41				1	2	2	1	2	2	1	2			1	1	1	1	1	1	1	40	
42				2								1	2	1	2	1	1	2	1	1	300	20000
43	2	1	1	1	2	2	2	2	2	1	2	1	1						1	7	130	60000
44	2	1	1	1	2	2	1	1	2	2	1	1	2	1	1	1	2	1	1	6	91	37000
45	2	2	2	1	2	2	1	1	2	2	2	2							0	0		
46	2	2	1	1	2	2	2	2	2	1	2	2		1	1	1	1	1	1	1	100	45000
47	2	1	2	2								2		1	1	2	2	2				
48				1	2	2	1	1	2	2	2	1	2	2	1	1	2	2	1	4	75	
49	2	2	1	1	2	2	1	2	2	2	2	2		1	1	2	2	2				
50	2	2	2	2								2										
51	2	2	2	2								2							1	1	14	
52	2	2	2	2								2							1	5	34	
53	2	2	2	2								2										
54	2	2	2	1	1	2	2	2	2	2	2	2	2									
55	2	1	1	2								2		2	1	2	2	2				
56	2	2	1	1	1	2	2	2	2	2	2	1	2	2	1	1	2	2	1	1	220	
57				1	2	2	2	1	2	2	2			1	1	1	2	1				
58	2	2	1	1	1	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	123	51250
59	2	2	2	2								2		1	2	2	2	1				
60	2	2	1	2								2		2	1	1	1	2	1	5	88	34500
61				1	2	2	1	2	2	2	2	1		2	1	1	2	2	1	1		
62	2	2	1	1										1	1	2	2	2				
63	2	2	2	1	2	2	2	1	2	1	2	1	1	1	1	1	2	2	1	7	135	
64	2	2	2	1	2	2	2	1	2	1	2	2		2	2	1	2	2	1	7		
65	2	2	2	1	2	2	2	1	2	2	2	1	2	1	1	1	1	1	1	7	100	47500
66	2	2	1	1	2	2	2	2	2	2	2	1	2	1	1	1	2	2	1	1	125	
67	2	1	1	1	2	2	1	1	2	2	2	2		1	1	1	2	2	1	1	92	37000
68	2	2	1	1	2	2	2	2	2	1	2	1	2	1	2	1	2	2	1	3	45	
69	1	2	2	1	2	2	2	1	2	2	2	1	2	2	2	1	2	2				
70	2	1	2	2								2	1	1	1	1	2	1				
71	2	2	2	1	2	2	1	2	2	2	2	1	2	2	2	1	2	2	1	1	80	30000
72	2	2	2	1	1	2	2	2	2	2	2	1	1									
73				2															1	1		
74				2								2										
75	2	2	1	1	2	2	1	2	2	2	2	1	1	2	2	2	2	2	1	1	80	
76	2	2	2	2								1	2	1	1	1	2	2	3			
77	2	2	2	1	2	2	2	1	2	2	2	1	2									
78	2	1	2	1	2	2	2	2	2	1	2	1	1	1	1	1	2	1	1	7	500	32800
79				1	2	2	2	2	2	1	2	1	1						1	1	33	
80	1	2	1	1	2	2	2	2	1	2	2			1	2	2	1	2	1	7	140	45000
81	1	2	1	1	2	2	2	2	1	2	2								1	7	140	45000
82	1	2	1	1	2	2	2	2	1	2	2								1	7	140	45000
83	1	2	1	1	2	2	2	2	1	2	2								1	7	140	45000
84				2								1	2	2	1	1	2	2	1	1		
85				1	2	2	1	2	2	2	2	2		2	2	2	2	2	1	4	82	35000
86	2	2	2	1	2	2	1	1	2	2	2			2	2	1	1	2	1			
87	2	2	2	1	2	2	2	2	2	1	2	2		2	2	1	2	2	1	6	87	34850
88				1	2	2	1	1	2	2	2	2		2	1	1	2	2	1	2		
89	2	2	2	1	2	2	2	1	1	2	2	2		2	2	1	2	2	1	1	100	55000
90	2	2	2	2								2										
91	2	2	1	2								1	2	1	1	2	2	2				
92	2	2	1	1	2	2	1	2	2	2	2	2		1	1	1	1	1	1	1	91	36900
93	2	2	2	2								2		1	1	1	1	2				
94	2	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	7	100	50000
95	1	2	2	2								1	2	1	1	1	2	1				
96	2	2	1	1	2	2	2	1	2	2	2	1	1	2	1	2	2	2	1	5	100	76000
97	2	2	2	2								2		1	1	1	2	2	1	2		
98	2	2	2	2								2		1	2	2	2	2	1	4	95	36000
99	2	2	1	1	1	2	2	2	2	2	2	2		2	2	2	2	2	1	4	160	
100	2	2	2	1	2	2	2	2	2	1	2								1	1	150	
101	2	2	2	1	2	2	1	1	2	2	2	2		2	2	1	2	2	1	2		
102	2	1	2									1		2	2	1	2	1				

Table G.1. Continues

NO	V14_6	V14_7	V14_8	V15_1	V15_2	V15_3	V15_4	V15_5	V15_6	V15_7	V15_8	V16_1	V16_2	V17_1	V17_2	V17_3	V17_4	V17_5	V18	V18A1	V18A2	V18A3
103	2	2	2	2								2		1	1	1	2	1				
104				2								2		1	2	2	2	2				
105	1	2	2	1	2	2	1	2	2	2	2	1		2	2	1	2	2	1	1		
106	2	2	2	2								2		2	1	1	2	2		0		
107	2	2	2	1	2	2	2	2	2	1	2	2		2	2	1	2	2	1	1	120	
108	2	2	2	1	2	2	1	1	2	2	2	2		2	1	2	2	2	1	1	88	34800
109				2								2							1	2		
110	2	2	2	1	2	2	1	2	2	2	2	1	2	2	2	1	2	2	1	1	90	
111				2																		
112				1	2	2	2	1	2	2	2	2		1	1	1	2	1	1	5		
113	2	1	2	1	1	2	2	2	2	2	2	1	2	1	1	1	2	2	1	5	120	50000
114	2	2	2	1	2	2	2	2	2	1	2	2		2	1	1	2	2	1	3	64	25000
115	2	2	2	1	2	2	2	1	2	2	2	2		1	1	1	2	2	1	4	57	
116	2	2	2	2								1	2	1	2	2	2	2				
117	2	2	1	1	2	2	1	1	2	1	2	2		1	1	1	1	1	3			
118	2	2	2	1	2	2	2	2	2	1	2	1	1	1	1	2	2	2	1	1		
119	2	2	2	0								2	2						1	7	100	
120	2	2	2	1	2	2	2	1	2	2	2	2		2	2	1	2	2	1	6	115	
121	2	2	2	1	2	2	1	2	2	2	2	2	1	1	2	2	2	2	1	4		
122	2	2	2	2								1	2									
123	1	1	1	1	2	2	2	2	2	1	2	2		2	2	1	2	2				
124	2	1	1	1	2	2	2	1	2	2	2	2		1	1	1	2	2	1	1	70	
125	2	2	2	2										2	1	1	1	2	1	2	45	45000
126	2	2	2	1	2	2	2	1	2	1	2	1	2	1	1	1	1	1	1	1	80	35000
127	2	2	2	1	2	2	2	1	2	1	2	1	2	2	2	1	2	2	1	7	161	45600
128	2	2	1	2	0	0	0	0				2		1	2	2	2	2				
129	2	2	2	1	2	2	1	2	2	2	2	1	1	1	2	2	2	2	1	1		
130	2	1	1	1	2	2	1	2	2	2	2	2		1	1	1	2	2	1	1	37	
131	2	1	1	2								2		1	1	1	2	2				
132	2	2	1	1	2	2	1	1	2	2	2	2		1	1	1	2	2	1	7	76	30750
133	2	2	2	1	2	2	2	1	2	2	2	2		2	2	1	2	2	1	7	90	30000
134	2	1	1	1	2	2	1	1	2	2	2	1	2	2	1	1	2	2	1	7	83	26000
135	2	2	1	1	2	2	2	1	2	2	2			2	1	2	2	2				
136	1	2	1	1	2	2	1	1	2	2	2	2		1	1	1	2	2				
137				1	2	2	1	1	2	2	2			2	1	2	2	2	1	7	70	26000
138	2	2	2	1	2	2	1	2	2	2	2	1	2	2	2	2	2	2	1	1	70	23000
139	2	2	2	1	2	2	2	1	2	2	2	1		1	2	1	2	2				
140	2	2	2	1	1	2	2	2	2	1	2	1	1	2	2	1	2	2	1	6	73	28700
141				1	1	2	2	2	2	2	2			1	2	2	2	2	1	7	100	
142				1	1	2	2	2	2	2	2	2		1	2	2	2	2	1	7	100	
143	2	2	2	1	2	2	1	1	2	2	1	2							1	7		
144	2	2	1	1	2	2	1	2	2	1	2	2		1	1	2	2	1	1	6	158	71820
145	2	2	2	1	2	2	2	1	2	2	2	2		2	2	1	2	2				
146				1	2	2	2	2	2	1	2	2		2	2	1	2	2	1	1		
147														2	1	1	2	1	1	7	59	26600
148	2	2	1	1	2	2	2	1	2	2	2	2		1	1	1	1	2				
149	2	2	2	1	2	2	1	1	2	2	2	1	2	2	1	1	2	1	1	1	100	
150	2	2	2	1	2	2	1	1	2	2	2	2		1	2	1	1	1				
151	2	2	2	1	2	2	1	2	2	2	2	2		2	1	1	2	2	1	5		
152	2	1	2	1	2	2	1	1	2	2	2	2	1	2	1	1	2	1	1	4	80	
153	2	2	1	2								2		1	2	2	2	2				
154				1	2	2	2	2	2	1	2	1	2						1	7	150	50000
155	2	2	2	2	2	1	2	2	2	2	2	0		2	1	2	2	2	1	1		
156	2	2	2	1	2	2	1	2	2	2	2	2	2	1	1	1	2	2	1	1		
157				1																		
158				1	2	2	2	2	2	1	2			1	2	2	1	2	1	5	100	
159	2	2	2	2								2		1	2	2	2	2				
160	2	2	1	1	2	2	2	1	1	2	2	2		2	2	1	1	1	1	1	100	
161	2	2	2	2								2		1	2	2	2	2				
162	2	2	2	2								2										
163	2	2	2	1	2	2	2	2	1	2	2	1	2						1	1		
164	2	2	2	1	1	2	2	2	2	2	2	2		2	2	1	2	2	1	1	135	56990
165				1	2	2	2	1	2	2	2	2		1	1	1	1	1				
166	2	1	2	2								2		2	1	2	2	2				
167				2								2		1	1	1	1	1				
168				1	1	2	2	1	2	2	2	2		2	2	1	2	2	1	7	40	30000
169	2	1	2	2								2		2	2	1	2	2	1	3	230	
170	2	2	1	1	2	2	2	1	2	2	2	1	1	2	2	2	2	2	1	1	82	32800
171	2	2	1	1	1	2	2	2	2	2	2	2		2	2	2	2	1	1	3	65	
172	2	2	2	1	2	2	2	1	2	2	2	2		2	2	1	2	2	0			
173	2	1	2	1	2	2	2	1	2	2	2	2		2	1	1	2	1	1	1		
174	2	2	2	1	2	2	2	1	2	2	2	2	2	1	1	1	2	2	1	1	75	34200
175	2	2	2	1	2	2	1	2	2	2	2	2		2	1	1	2	2	1	1	35	
176	2	2	2	1	2	2	2	1	2	2	2	2		2	2	1	2	2	1	3	60	
177				1	2	2	2	2	2	1	2	2							1	2	74	
178	2	2	1	1	2	2	2	2	2	1	2	2		2	1	1	2	2	1	7	50	
179	2	1	2	2								2		2	1	1	2	2				
180	2	1	2	1	2	2	2	1	2	1	2	1	2	2	1	2	1	2	1	6	200	45000
181	2	1	1	1	2	2	2	2	2	1	2	1	1	2	2	1	2	2				
182	2	2	2	1	2	2	2	2	1	2	2	2							1	7	75	
183	2	2	1	2								1	2	2	2	1	2	2			50	
184	2	2	2	1	2	2	2	2	2	2	2			2	2	1	2	2	1	7		
185	1	1	2	1	2	2	1	2	2	1	2			1	1	1	2	1	1	7	100	42000
186	2	2	2	1	1	2	2	1	2	2	2	2		1	1	2	2	2	1	2	79	36100
187				1	2	2	2	2	2	2	2	2		2	2	2	2	2	1	1	73	28700
188	2	2	2	1	2	2	1	1	2	2	2	2		2	1	1	2	2	1	4	100	45000
189	2	2	2	2								2		2	1	2	2	2	1	4		
190	2	2	1	1	2	2	1	1	2	1	2	1	2	2	1	2	2	2	1	7	90	
191	2	2	1	1	2	2	2	2	2	1	2	2		1	1	2	2	2	1	6	99	40590
192	1	2	1	1	2	2	1	1	2	1	2			1	1	1	1	1	1	7	70	40000
193	2	2	2	1	2	2	2	1	2	2	2	1	2	2	1	2	1	2			90	
194	2	2	2	1	2	2	2	2	2	1	2	1	1	2	1	1	2	2	1	4	100	100000
195	2	2	2	2								2		1	1	1	2	2	1	7	100	
196	2	2	2	2																		
197	2	2	2	1	2	2	1	2	2	2	2	1										
198	2	2	1	2								2		1	1	1	2	2				
199	2	2	2	1	2	2	2	2	2	1	2	2		2	2	1	2	2	1	2		15000
200	2	2	2	2								2		1	2	2	2	2	1	2	48	
201				1	2	2	1	2	2	2	2	2		1	2	2	2	2				
202	2	2	2	1	2	2	2	1	2	2	2	2		2	1	1	2	1	1	5		
203	2	2	2	1	2	1	1	2	2	2	2	2		2	2	1	2	1	1	7	100	80000
204	2	2	1	1	2	2	2	1	2	2	2	2		2	2	2	2	1				
205	2	2	1	1	2	2	2	1	2	1	1	2		2	1	2	2	2	1	7		
206	2	2	2	1								1	2	2	1	1	2	2	1	1		
207	2	2	2	1	1	2	1	1	2	2	2	1	2	1	1	1	1	1	1	6	83	32800

Table G.1. Continues

NO	V18A4 1	V18A4 2	V18A4 3	V18A4 4	V18A4 5	V18A4 6	V18A4 7	V18A4 8	V18A4 9	V18A4 10	V18A4 11	V18A4 12	V18A5 1	V18A5 2	V18A5 3	V18A5 4	V18A5 5
1																	
2													1				
3	3	1	2	2	4	2	1	1	3	1	1	1	1	1	5	2	4
4	5	3	4	4	4	4	4		4	4	2	5	1	3	2	2	4
5																	
6	3	3				3				3	3		1	1	1	1	1
7	3	3													1	1	1
8	2	3	5	3		4	3	3	4	3	4	4	2	3	3	1	3
9	3	2	0	1		5	1	1	1			1	2	3	1	1	4
10	2	3	2	2	3	4	1	2	3	5	2	2	2	3	3	4	3
11																	
12	4	5	3	5	5	5	3	3	5	3	3	3	1	3	2	1	5
13	5	4	1	2	1	3	3	3	5	2	1	1	1	2	1	1	1
14																	
15	1	1	2	1		1	2	1	1			1	1	4	1	3	4
16	3	5	5	5	5	5	1	1	4	1	1	1	5	5	4	5	4
17	5	5	5	5	4	5	1	1	1	2	1	1	1	2	4	2	5
18																	
19	5	3	5	3	4	5	1	1	5	5	4	3	1	2	5	1	5
20	3	4	2	3	1	3	1	1	2	2	3	3	3	4	4	2	3
21	4	3	2	3	3	3	3	3	3	2	1	1	1	1	2	3	5
22	3	3	3	3		3			3	3			2		3	0	0
23															0	0	0
24	3	2	3			3	3	3	1	1	1	1	5	5	5	5	5
25	5	5	5	3	5	5	2	2	4	5	5	5	2	3	2	2	4
26	5	3	1	1	1	3	1	1	2	1	1	3	1	1	4	1	5
27	1	3	3						3	0			2	4	4	2	4
28	5	5	5	5		5			5	0			1	3	5	3	5
29																	
30	3	5	4	3	3	3	2	2	1	1	1	3	1	5	3	1	5
31	5	5	1	1	1	5	1	1	1	5	1	1	1	1	5	1	5
32	5	1		1									1	1		2	0
33													1				
34	3	3	3	3	3	4	1	3	4	1	1	2	1	4	5	5	2
35																	
36	4	3	5	2	3	4	1	1	2	3	1	2	2	2	4	1	3
37	2	5	2		2	3	1	1	3	1	1	1	1	3	3	2	3
38	5	3	1	2	1	4	1	1	3	1	1	1	1	1	1	5	4
39	2	3	5	1	1	4	1	1	2	1	1	5	3	4	2	3	3
40	4	3	4	4	3	4	1	1	3	5	5	3	3	3	4	2	5
41													2	4	2	2	4
42	5	2	4	2	2	3	2	2	5	4	4	4	3	4	2	2	5
43	3	3	4	1		4	2	2	4	0	2	3	2	3	4	1	4
44	3	3	4	3		4			4	4	3	3	2	3	4	2	4
45																	
46	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2		
47																	
48	2	2	3	2	3	3	1	1	1	1	1	1	2	3	3	3	3
49																	
50																	
51																	
52	4	1	1		1	1	1	1	3	3	3	3	1	1	1	1	5
53																	
54													5	5	2	2	2
55																	
56	4	3	5	4		5	5	5	5	5	5		1	1	4	4	4
57																	
58	2	2	3	2	3	5	3	2	2	2	1	3	2	1	4	1	3
59																	
60	5	5	1	1	1	5	1	1	1	5	1	1	1	1	5	1	5
61																	
62																	
63	3	1	3	2	3	1	1	3	5	4	5		1	3	2	2	4
64	4	1	1	1	1	1	1	1	1	1	1	1	1	3	1	0	5
65	1	1	1	1	1	1	1	1	1	5	5	5	1	5	3	1	5
66	3	3	5	2	1	3	1	4	4	5	5	3	2	5	2	5	4
67	5	5	5	1	1	5	1	1	2	1	1	1	3	3	2	1	3
68	1	4	4	4	3	5	1	1	1	5	5		3	3	1	3	0
69																	
70																	
71	5	2	3	3	3	5	1	3	5	1	1	5	5	3	1	1	5
72																	
73	4	3	4										2	4			
74																	
75	2	3	3	1	1	1	2	2	2	2	2	2	3	5	1	2	2
76													1				
77																	
78	5	5	5	5	5	5	2	2	5	5	2	1	1	4	2	1	4
79										3			1	2	3		4
80	4	3	4	3	4	5	1	1	4	4	3	1	1	2	4	2	5
81	4	3	4	3	4	5	1	1	4	4	2	1	1	2	4	2	5
82	4	3	4	3	4	5	1	1	4	4	2	1	1	2	4	2	5
83	4	3	4	3	4	5	1	1	4	4	2	1	1	2	4	2	5
84	5	4	4	3	3	4	1	1	3	3	1	3	4	4	3	2	5
85	4	3	5	4	4	4	2	2	1	3	3	3	2	3	4	2	5
86	4	4	3	3	2	3	1	1	2	3	4	3	2	4	1	1	5
87	2	3	3	1	1	3	1	1	1	1	1	1	3	3	2	2	3
88	3	2	3			3		3				3			1	1	3
89	3	3	3	2	2	3	1	1	1	3	2	3	2	4	3	2	4
90																	
91																	
92	2	2	3	4	1	5	1	1	3	5	3	5	4	2	1	1	1
93																	
94	5	5	5	5	5	5	1	1	5	5	5		1	4	1	1	3
95																	
96	5	5	5	5	5	5	1	1	5	5	5	5	1	1	5	1	5
97																	
98	3	3	2	2	4	5	4	2	5		2	4	1	3	2	4	4
99	4	4	2	2	4	1	2	5	5	2	1	1	1	2	2	2	4
100	5	4	3	3	3	5	3	3	4	5	3	3	1	3	3	3	5
101	4	5	4	3	2	3	1	2	4	4	3	5	3	2	4	4	2
102																	

Table G.1. Continues

NO	V18A4 1	V18A4 2	V18A4 3	V18A4 4	V18A4 5	V18A4 6	V18A4 7	V18A4 8	V18A4 9	V18A4 10	V18A4 11	V18A4 12	V18A5 1	V18A5 2	V18A5 3	V18A5 4	V18A5 5
103																	
104																	
105													4	3	1	2	1
106																	
107	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	4
108	5	1	2		3	5	1	1	3				1	1	4	1	5
109	2												3				
110	1				5								1			1	
111																	
112	3	1	1	3	2	3	1	1	2	3	3	1	1	3	2	2	3
113	5	3	1	3	3	3	1	1	2	5	3	3	5	2	2	2	5
114		5	5	5		5				5		5	3	5	1	1	1
115	3	1	3			3			3						2	1	
116																	
117																	
118	3		3	2	3	3	1	1	3	3	1	3	2	4	2	2	4
119	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
120	4	3	1	2	3	3	1	1	2	1	2	1	3	5	4	3	5
121	5	5	5	2	4	5	1	1	5	3	4	1	1	2	1	1	5
122																	
123																	
124	4	4	5		3	5	1	1	2	2	1	1	1	3	1	1	1
125	5	3	1	4	1	3	1	1	2	1	2	3	3	5	4	1	3
126	3	3	3	1	3	5	1	1	2		1	1	1	1	5	1	1
127	5	5	5	3	3	4	2	3	4	3	2	1	1	1	4	1	5
128																	
129	4	5	3	4	4	5	3	3	3	4	1	0	1	2	2		5
130	3	1		1					2	3	1	1	3	5	1	3	3
131																	
132		4	5	5	1	1	1	1	1	1	5	5	5	4	1	1	4
133	2	2	1	2						1			2	2	1	1	
134	1			1		1			1	1			1	1	1	1	
135	4	3	5	0		3				4							
136	4	5	3	1		5											
137		3				3				3		3	1			1	1
138	2	2	1	1	1	1							1	3	4	2	4
139																	
140	2	5	1	2	3	2	1	1	1	3	3	3	2	4	4	2	4
141	5	5											1				
142	5	5											1				
143	4	3		3	3		1	1	2	2	1		1	1	4	3	5
144	3	4	2	3	2	4	1	1	2	3	2	1	2	4	4	3	4
145	3	4	3	2	2	4	3	1	3	3	3	3	2	3	2	2	4
146						5											
147	4	4	5	4	5	5	1	1	3	3	3	3	1	2	4	1	4
148																	
149	5	5		5		5			5	5	5		1	1			
150																	
151	5	5	5	5	5	5	2	2	2	5	2	2	5	5	3	3	5
152	4	4		3	3	5	2	2	4	4	2	4	4	2	2	2	4
153																	
154	3	3	3	3		3	2	2	3	3	3	3	1	1	2	2	4
155	3	3				5			3			3	1	2	2		3
156	3	4	4	2	1	5	1	2	2	2	2	2	1	4	1	3	4
157																	
158	1	5	5	5	4	4	1	1	4	1	1	1	1	1	3	3	5
159																	
160	3	3	1	5	5	5	1	1	5	5	1	5	1	1	5	4	5
161																	
162																	
163												5					
164	3					5											
165																	
166																	
167																	
168	3	4	5	5	2	5	2	3	3	3	2	1	1	2	3	2	4
169	3	4	3	3	3	3	3	3	3	3	3	3	3	1	2	2	3
170	3	3	5	3	5	5	3	3	5	3	3	3	5	4	3	2	4
171	3	4	4	3	2	3	1	1	2	4	2	5	2	2	3	3	4
172																	
173	5	5	5	5	4	5	5	5	5	5	5	5	1	1	2	2	3
174	4	2	4			5			5	4	3	3	4	5	1		2
175						4	3	3	5						1		
176	3	4	4	3	3	5	1	1	5	5	1	3	1	4	4	1	5
177	5	5	5	3		3	2	2	5	3	2	2	2	3	2	2	2
178	3	3	4	4	5	3	1	1	1	1	1	3	1	2	3	5	1
179	1		1	2													
180	4	4	4	4	2	5	1	1	4	4	1	4	1	1	4	1	5
181	3	3	3	3	3	3	3	3	3	3	3	3	2	2	4	1	4
182										5			1				
183	1	2	5	2	1	5	1	1	2	2	1	1	2	2	2	3	
184	2	1								3			1	4	1	1	3
185	5	5	5	1	3	5	1		2	1	1	1	1	5	2	2	5
186	4	4	4	3	3	5	3	3	3	3	3	2	1	2	2	2	5
187	3	3	3	3	3	4	1	1	3	3	3	3	5	4	5	1	2
188	3	3	3	3	3	3	2	2	3	2	3	4					
189	1	2	2	1	2	3	1	3	1	1	1	3	2	3	2	2	2
190	4	3	5	3	3	5		1	5	4	4	4	1	1	4	3	
191	3	5	5	4	4	4	2	1	5	5	5	5	1	3	4	3	4
192	4	4	5	1	1	5	1	1	1	2	1	2	1	3	2	1	5
193	3	3	1	3	1	3	1	1	1	1	1	1	1	3	4	3	4
194	3	3	3	2		2		2		2	1		1	3	4	4	4
195	5	5											1	3	4	1	4
196	4																
197																	
198																	
199	3	3	3	2	3	3	2	2	4	4	4	3	2	4	2	1	3
200																	
201																	
202	2	3	2	2	3	2	2	2	3	3	1	1	1	3	2	3	4
203	4	5	4	1	4	4	1	1	4	1	1	4	1	3	3	1	5
204		3											4	4	1	2	
205	4		3	3	3	3				3	3	3	2				
206	1		5										4	4	2	3	2
207	3				5	5			1	1		1	2	3	5	5	4

Table G.1. Continues

NO	V18A5_6	V18B1_1	V18B1_2	V18B1_3	V18B1_4	V18B1_5	V18B1_6	V18B1_7	V18B1_8	V18B1_9	V18B1_10	V18B1_11	V18B2	V19_1	V19_2	V19_3	V19_4	V19_5
1																		
2														1	1	2	2	2
3	1													6	1	1	1	2
4	2													2	1	2	2	1
5		5	5	1	5		1	3	3	5	5		1	1	2	1	2	2
6	1													5	1	2	1	1
7	1																	
8	2													1	2	1	2	2
9	3																	
10	2																	
11													1	1	2	2	2	2
12	2													2	1	2	2	2
13	1																	
14													1	1	2	2	2	2
15	1													1	2	2	2	2
16	5													5	2	2	1	1
17	1													1	1	2	2	2
18			2	2	1		1	1	1	1	1	1	2					
19	0													1	1	2	2	2
20	4																	
21	2													1	2	2	2	2
22	0																	
23	0	5	1	1	2	1	3	1	2	4	3	1	0					
24	1													1	2	2	2	1
25	0													5	1	1	2	1
26	1													5	2	2	1	1
27	2																	
28	1													2	2	2	2	1
29		3	2	1	1	2	2	2	2	1	3	0	2	1	2	2	2	2
30	1													1	1	2	2	2
31	1													6	1	2	1	1
32														1	2	1	2	2
33	1													2	2	1	2	2
34	4													1	1	2	2	2
35		2	1	1	1	1	1	1	2	1	1	1	0					
36	2													3	1	2	2	1
37	3													2	2	1	2	2
38	1													7	1	1	1	1
39	5																	
40	1																	
41	2													2	2	1	2	2
42														4	2	2	2	1
43	4													3	2	1	2	2
44	2													3	2	2	1	1
45		5	4	4	2	2	5	0	1	1	1	0	2					
46														7	2	1	1	1
47														1	2	1	2	2
48	2													2	1	2	2	1
49		3	4	2	1	3	2	3	5	2	3							
50													2					
51														1	2	1	2	2
52																		
53		3	3	1	1	2	1	2	1	1	2	1	2					
54	2	5	5	5	1	5	5		1	1	1	1	2	1	2	2	2	2
55		5	5	1	1	5	5	1	1	1	1	1	2	1	2	2	2	2
56	1													5	1	2	1	1
57		5	4	1	1	1	2	1	1	1	1	1		2	2	1	2	2
58														5	1	2	1	1
59		2	1	1	1	1	2	2	1	3	3	1	1	2	2	2	2	2
60	1													5	1	2	1	1
61														1	1	2	2	2
62		3	2	3	2	3	3	3	1	2	3	1		2	2	2	2	2
63	2													2	1	2	2	1
64	1													4	2	2	2	1
65	5																	
66	2																	
67	3													1	1	2	2	2
68	0																	
69		2	2	2	2	2	2	2	2	2	2							
70		3	5	5	1	5	3	3	1	5	5		2		2	2	2	2
71	1													2	2	2	2	1
72														3	2	1	2	2
73														2	1	2	2	2
74										4	5		1					
75	3													1	2	1	2	2
76																1		
77						1							1					
78														1	2	2	2	1
79																		
80	2													8	1	1	1	1
81	2													8	1	1	1	1
82	2													8	1	1	1	1
83	2													8	1	1	1	1
84	2																	
85																		
86	3													1	1	2	2	2
87														1	2	2	2	2
88		2	1	3	1	2	1	1	1	1	1	1	2	1	2	1	2	2
89														3	1	2	2	2
90		5		5		5		5				5	2					
91																		
92	1													6	1	1	1	1
93		4	1	1	1	1	2	3	1	1	5	1	1	2	2	1	2	2
94	1													1	1	2	2	2
95		5				5							1					
96	1													7	1	1	1	1
97													1	1	2	2	2	2
98	4													1	1	2	2	2
99	4													8	1	1	1	1
100	3													3	1	2	2	1
101	1													1	2	2	2	2
102																		

Table G.1. Continues

NO	V18A5_6	V18B1_1	V18B1_2	V18B1_3	V18B1_4	V18B1_5	V18B1_6	V18B1_7	V18B1_8	V18B1_9	V18B1_10	V18B1_11	V18B2	V19_1	V19_2	V19_3	V19_4	V19_5
103		4	2	3	2	3	4	5	1	3	4	1	2					
104		5		1				3			3		2	1	2	2	2	2
105	3													2	2	2	2	2
106			5	5	3	4							2					
107	1																	
108	1													1	2	2	2	2
109																		
110														2	2	1	2	2
111														4	2	2	1	1
112														2	1	2	2	2
113	2													3	2	1	2	1
114																		
115														1	2	1	2	2
116																		
117														1	2	2	2	2
118	0													4	1	2	2	1
119	2																	
120														1	2	2	2	2
121	0																	
122		5	5	5	2	1	1	1	2	3	5	5	1	1	2	2	2	2
123		5											1	2	2	2	2	2
124	0													2	2	1	2	1
125	3													1	2	1	2	2
126	1													7	1	2	1	1
127	1													6	2	1	1	1
128		1	1	1	1	1	1	1	1	2	2	1	2					
129	1													5	1	2	2	1
130	0													2	2	2	2	2
131		2	3	1	3	3	2	2	2	2	2	1	2	1	2	2	2	2
132	3													2	2	2	2	2
133	1													6	1	1	1	1
134	0													6	2	1	1	1
135	0													3	1	2	1	2
136	0																	
137	1													1	2	1	2	2
138	0													1	2	1	2	2
139														0	0	0	0	0
140	0													1	2	2	2	1
141	0													1	2	2	2	1
142	0													1	2	2	2	1
143	1													2	2	2	2	1
144	2													1	1	2	2	2
145	3																	
145														1	2	2	2	2
147	1																	
148		4	1	5	1	4	2	3	1	1	5	1		1	2	2	2	2
149	1													2	1	2	2	2
150		5	2	1	5	1	1	1	1	1	1		2	1	2	2	2	2
151														1	2	1	2	2
152																		
153		5	1	1	1	1	1	1	1	5	1		2	1	2	2	2	2
154														3	1	2	1	1
155																		
156	2													1	2	2	2	1
157														1	2	2	2	2
158	0													8	2	1	1	1
159		1	2	2	1	1	1	1	5	3	1	5						
160	1													6	2	1	1	1
161		4	1	4	1	2	1	2	1	1	5			1	2	2	2	2
162														1	2	2	2	2
163	0														2	2	2	2
164														5	2	2	1	1
165																		
166		1	1	5	3	5	1	1	1	1	1	1	1	2	2	1	2	2
167		1	2	3	2	1	2	2	2	1	1	1	2		2	2	2	2
168	2													1	2	2	2	2
169	4													4	1	2	1	2
170	2																	
171	2													2	1	2	2	1
172		3	1	1	1	1	1	1	3	3	1	2	1	1	2	2	2	2
173														1	2	2	2	1
174	4																	
175	0																	
176	0													2	1	1	2	2
177	0													1	2	2	2	1
178	2													4	2	1	2	1
179	0													3	2	1	2	2
180	1													3	2	1	2	1
181	2												1					
182														3	1	2	2	1
183														2	2	2	2	1
184	1																	
185	1													1	2	1	2	2
186														5	1	2	1	1
187																		
188																		
189	3																	
190	0													2	1	2	2	1
191	1													7	1	1	1	2
192	0													2	1	1	2	2
193	2													1	2	2	2	2
194	2																	
195	2													3	1	1	1	2
196														1	1	2	2	2
197														3	2	1	2	2
198	0																	
199														1	2	1	2	2
200													2					
201		4	1	3									2					
202	2														2	2	2	2
203	1																	
204																		
205														1	1	2	2	2
206																		
207	1													1	2	2	2	1

Table G.1. Continues

NO	V19_6	V19_7	V19_8	V19_9	V19_10	V20_1	V20_2	V20_3	V20_4	V20_5	V20_6	V20_7	V21_1	V21_2	V22_1	V22_2	V22_3	V22_4	V22_5	V22_6
1																				
2	2	2	2	2	2	1	2	2	2	1	2	1		1	1	2	2	2	2	2
3	1	1	2	2	1	2	1	1	2	2	2	1	1		1	2	2	2	2	2
4	2	2	2	2	2	1	2	1	2	2	2	1		1	2	2	2	2	2	1
5	2	2	2	2	2		2	2	2	2	1		1		2	2	1	2	2	2
6	2	1	2	2	1	1	1	2	2	2	2	2		1	1	1	1	1	2	2
7												2	3		1	1	2	2	2	1
8	2	2	2	2	2		2	2	2	2	1		5		2	2	2	1	1	2
9						1	1	2	2	2	2	1	8							
10						2	1	2	1	2	2	1	9							
11	2	2	2	2	2	1	1	2	2	2	2	2		1	2	2	2	2	2	1
12	1	2	2	2	2	1	2	1	2	2	2	1	4							
13							2	2	2	2	1			1	1	2	1	2	1	2
14	2	2	1	2	2									1	2	2	2	2	2	1
15	1	2	2	2	2	1	2	2	2	1	2	2		1	1	1	2	2	2	2
16	2	1	2	1	1		2	2	2	2	1	2			2	2	2	2	2	1
17	2	2	2	2	2									1	1	2	2	2	2	2
18							2	2	2	2	1	2		1	2	2	2	2	2	1
19	2	2	2	2	2	1	2	2	2	1	2	2		1	1	2	2	2	2	2
20							2	2	2	2	1			1	2	2	2	2	2	1
21	1	2	2	2	2							2	3		1	2	2	2	2	2
22														1						
23						3	1	1	1	2	2	2		1	1	2	2	2	2	2
24	2	2	2	2	2		2	2	2	2	1		2		2	2	2	2	2	1
25	1	2	2	2	1		2	2	2	2	1			1	2	2	2	2	2	1
26	2	1	2	1	1	2	1	1	2	2	2	1								
27														2	1	1	2	2	2	2
28	1	2	2	2	2	1	2	2	2	2	2	2		1	2	2	2	2	2	1
29	2	2	1	2	2	1	1	2	2	2	2	2		1	2	1	2	2	2	2
30	2	2	2	2	2		2	2	2	2	1			1	1	2	1	2	1	2
31	2	1	2	1	1	1	1	2	2	2	2	2	3		1	2	2	2	2	2
32	2	2	2	2	2		2	2	2	2	1			1						
33	2	2	1	2	2		2	2	2	2	1			1	2	2	2	2	2	1
34	2	2	2	2	2	1	1	2	2	2	2	2		1	1	2	2	2	2	2
35														1	2	2	2	2	2	1
36	2	1	2	2	2		2	2	2	2	1		1		1	2	2	1	2	2
37	1	2	2	2	2		2	2	2	2	1	2		1	2	2	2	2	2	1
38	2	1	2	1	1	1	1	2	2	2	2	1	1		1	1	2	1	1	2
39							2	2	2	2	1	0		1	2	2	2	2	2	1
40						1	1	2	2	2	2	1		1	2	2	2	2	2	1
41	1	2	2	2	2							1	1		2	1	2	2	2	2
42	1	1	2	1	2							1	4		2	1	1	2	2	2
43	1	2	1	2	2	1	2	1	2	2	2	2		1	2	2	2	2	2	1
44	2	1	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
45						1	1	2	2	2	2	2		1	2	2	2	2	2	1
46	1	1	2	1	1		2	2	2	2	1			1	2	1	2	2	1	2
47	2	2	2	2	2		2	2	2	2	1	2		1	1	2	2	2	2	2
48	2	2	2	2	2	1	1	2	2	2	2	1		1	1	2	2	2	2	2
49							2	2	2	2	1			1	2	1	2	2	2	1
50											1			1	2	2	2	2	2	1
51	2	2	2	2	2		2	2	2	2	1			1	2	1	2	2	2	2
52							2	2	2	2	1	2		1	1	1	2	1	1	2
53						1	1	2	2	2	2	2		1	2	2	2	2	2	1
54	1	2	2	2	2		2	2	2	2	1	2		1	2	1	2	2	2	2
55	1	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
56	2	1	2	2	1	1	1	2	2	2	2	1	6		1	1	2	1	1	2
57	1	2	2	2	2		2	2	2	2	1			1	1	2	2	2	2	2
58	2	1	2	2	1		2	2	2	2	1			1	2	2	2	2	2	1
59	1	2	2	2	2		2	2	2	2	1			1	1	2	2	2	1	2
60	2	1	2	2	1		2	2	2	2	1			1	1	2	2	2	2	2
61	2	2	2	2	2	1	2	2	2	2	2	1	3		2	1	2	2	2	2
62	1	2	2	2	2	1	1	2	2	2	2	2	1		1	2	2	2	1	2
63	2	2	2	2	2	1	1	2	2	2	2	1		1	2	2	2	2	2	1
64	2	1	1	2	1	3	1	1	2	1	2	1		1	2	2	2	2	2	1
65							2	2	2	2	1			1	2	2	2	2	2	1
66						1	1	2	2	2	2	2		1	2	2	2	2	2	1
67	2	2	2	2	2	1	2	2	2	1	2	2		1	2	2	2	2	2	1
68							2	2	2	2	1			1	2	2	2	2	2	1
69						1	2	1	2	2	2	2		1	2	2	2	2	2	1
70	2	2	2	2	2		2	2	2	2	1			2	2	2	2	2	2	1
71	2	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
72	1	2	2	1	2	1	2	2	2	1	2			1	2	2	1	2	2	2
73	1	2	2	2	2							1	4		2	2	2	2	2	1
74														1	2	2	2	2	2	1
75	2	2	2	2	2	1	1	2	2	2	2	2		1	2	1	2	2	2	2
76							2	2	2	2	1	0		1	2	2	2	2	2	1
77							2	2	2	2	1	2		1	1	2	2	2	2	1
78	2	2	2	2	2	1	2	2	2	1	2	0		1	1	1	2	2	2	2
79							2	2	2	2	1	2		1	2	2	2	2	2	1
80	1	1	1	1	1								10		2	2	2	2	1	2
81	1	1	1	1	1								10		2	2	2	2	1	2
82	1	1	1	1	1								10		2	2	2	2	1	2
83	1	1	1	1	1								10		2	2	2	2	1	2
84														1	2	1	2	2	2	2
85							2	2	2	2	1	2		1	2	2	2	2	2	1
86	2	2	2	2	2									1	1	1	1	1	1	2
87	2	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
88	2	2	2	2	2	1	1	2	2	2	2	2	4		1	1	2	2	1	2
89	1	2	1	2	2		2	2	2	2	1	2		1	2	2	2	2	2	1
90						1	1	2	2	2	2	2		1	2	2	2	2	2	1
91						2	1	1	2	2	2	2		1	1	2	2	1	1	2
92	2	1	2	1	2	2	1	2	2	1	2	1		1	2	1	2	1	2	2
93	1	2	2	2	2	1	1	2	2	2	2	2		1	2	2	2	2	2	1
94	2	2	2	2	2		2	2	2	2	1	2		1	2	2	2	2	2	1
95							2	2	2	2	1	2		1	2	2	2	2	2	1
96	1	1	2	1	1	2	1	2	2	1	2	2		1	1	2	2	2	2	2
97	1	2	2	2	2									1	2	2	2	2	2	1
98	2	2	2	2	2		2	2	2	2	2			1	1	2	2	2	2	2
99	1	1	2	1	1	1	1	2	2	2	2	1		1	2	2	2	2	2	1
100	1	2	2	2	2	1	1	2	2	2	2			1						
101	1	2	2	2	2		2	2	2	2	1	2	1		2	2	2	2	2	1
102																				

Table G.1. Continues

NO	V19_6	V19_7	V19_8	V19_9	V19_10	V20_1	V20_2	V20_3	V20_4	V20_5	V20_6	V20_7	V21_1	V21_2	V22_1	V22_2	V22_3	V22_4	V22_5	V22_6
103							2	2	2	2	1			1	1	2	2	2	2	2
104	2	2	1	2	2		2	2	2	2	1			1	1	2	2	2	2	2
105	1	2	2	2	2	1	2	1	2	2	2			1	2	2	2	1	2	2
106						2	1	1	2	2	2									
107							2	2	2	2	1		2		1	2	2	2	2	2
108	1	2	2	2	2		2	2	2	2	1			1	1	2	2	2	2	2
109							2	2	2	2	1			1	2	2	2	1	2	2
110	2	2	1	2	2		2	2	2	2	1			1	2	1	2	2	2	2
111	2	1	2	2	1		2	2	2	2	1			1	2	2	2	2	2	1
112	1	2	2	2	2		2	2	2	2	1		3							
113	1	2	2	2	2	1	1	2	2	2	2	2		1	1	2	2	2	1	2
114						1	2	2	2	1	2		0		1	1	2	2	2	2
115	2	2	2	2	2		2	2	2	2	1									
116							2	2	2	2	1	2		1	2	2	2	2	2	1
117	1	2	2	2	2		2	2	2	2	1			1	1	2	2	2	1	2
118	2	2	1	2	1	1	2	1	2	2	2	1		1	2	2	2	2	2	1
119						1	2	1	2	2	2	2	1		2	2	2	2	1	2
120	1	2	2	2	2								6							
121							2	2	2	2	1			1	2	2	2	2	2	1
122	2	2	1	2	2		2	2	2	2	1			1	1	1	1	2	2	2
123	1	2	2	2	2	1	2	2	2	2	2	2		1	2	1	2	2	2	2
124	2	2	2	2	2	1	1	2	2	2	2	2		1	2	2	2	2	2	1
125	2	2	2	2	2	1	1	2	2	2	2		2		2	1	2	2	2	2
126	1	1	2	1	1	2	1	2	2	1	2	2		1						
127	2	1	2	1	1	1	1	2	2	2	2	1		1	1	2	2	1	1	2
128							2	2	2	2	1				2	2	2	2	2	1
129	1	2	1	1	2	1	2	1	2	2	2	1		1	2	2	2	2	2	1
130	2	2	2	2	2	1	2	2	1	2	2	2		1	2	2	2	2	2	1
131	1	2	2	2	2								2		1	2	2	2	2	2
132	1	2	2	2	2								7		1	1	2	1	2	2
133	2	1	2	2	1	2	2	1	1	2	2		1		1	2	2	2	1	2
134	1	1	2	2	1		2	2	2	2	1			1	1	2	2	1	2	1
135	1	2	2	2	2									1	2	2	1	2	2	2
136															1	1	2	1	2	2
137	2	2	2	2	2	1	1	2	2	2	2	1	4		1	2	2	1	1	2
138	2	2	2	2	2		2	2	2	2	1	2		1	1	2	2	2	2	2
139	0	0	0	0	0		2	2	2	2	1			1	2	2	2	2	2	1
140	2	2	2	2	2		2	2	2	2	1		1		2	2	2	2	2	1
141	2	2	2	2	2		2	2	2	2	1		2		1	2	2	2	1	2
142	2	2	2	2	2		2	2	2	2	1		2		1	2	2	2	1	2
143	1	2	2	2	2		2	2	2	2	1		3		2	1	2	2	2	2
144	2	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
145							2	2	2	2	1			1	1	1	1	2	2	2
146	1	2	2	2	2									1						
147																				
148	1	2	2	2	2		2	2	2	2	1		0		1	2	2	2	2	2
149	1	2	2	2	2								2		2	2	2	2	2	1
150	1	2	2	2	2		2	2	2	2	1		1		1	2	2	1	2	1
151	2	2	2	2	2									1	1	2	2	2	2	2
152						1	1	2	2	2	2			1	2	2	2	2	2	2
153	1	2	2	2	2		2	2	2	2	1	2	5							
154	1	2	2	2	2		2	2	2	2	1		2		2	2	2	2	2	1
155							2	2	2	2	1	2		1	2	2	2	2	2	1
156	2	2	2	2	2	1	1	2	2	2	2	1		1	1	2	2	2	2	2
157	1	2	2	2	2															
158	1	1	1	1	1		2	2	2	2	1			1	2	2	2	2	2	1
159																				
160	2	1	2	1	1		2	2	2	2	1	2		1	2	2	2	2	2	1
161	1	2	2	2	2	1	2	2	2	1	2	2		1	2	1	2	2	2	2
162	1	2	2	2	2		2	2	2	2	1	2		1	2	2	2	2	2	1
163	2	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
164	1	1	2	1	2	1	1	2	2	2	2	2		1	2	1	1	2	2	2
165							2	2	2	2	1									
166	1	2	2	2	2	1	2	2	2	1	2	2		1	1	2	1	2	1	2
167	2	2	2	2	2										2	2	2	2	2	1
168	1	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
169	1	2	2	2	1		2	2	2	2	1	2		1	1	2	2	1	2	2
170														1						
171	2	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
172	1	2	2	2	2	1	2	1	2	2	2	2		1	2	2	2	2	2	1
173	2	2	2	2	2								2		2	2	2	2	2	1
174													3							
175							2	2	2	2	1			1	1	2	2	2	2	2
176	2	2	2	2	2		2	2	2	2	1	2	5		1	2	2	2	2	2
177	2	2	2	2	2		2	2	2	2	1	2		1	2	2	2	2	2	1
178	1	2	2	1	2		2	2	2	2	1			1	2	2	2	2	2	1
179	1	2	2	1	2									1	2	2	2	2	2	1
180	1	2	2	2	2	1	1	2	2	2	2	2	4		2	1	2	2	2	1
181						3	1	1	2	1	2		3		1	2	2	2	1	2
182	2	2	1	2	2		2	2	2	2	1	2			2	2	2	2	2	1
183	2	1	2	2	2	1	2	2	2	1	2			1	2	2	2	2	2	1
184																				
185	2	2	2	2	2	1	1	2	2	2	2	1		1	2	2	2	2	2	1
186	2	1	2	2	1		2	2	2	2	1			1	1	2	2	2	2	1
187						1	2	1	2	2	2	1	2							
188																				
189																				
190	2	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
191	1	1	2	1	1	1	2	2	1	2	2	1		1	2	2	2	2	2	1
192	2	2	2	2	2		2	2	2	2	1		15							
193	1	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
194						1	2	1	2	2	2	2		1	1	2	2	2	1	2
195	2	2	2	2	2		2	2	2	2	1			1	1	2	2	2	2	2
196	2	2	2	2	2									1	2	2	2	2	2	1
197	1	2	1	2	2		2	2	2	2	1			1	2	1	2	2	2	1
198							2	2	2	2	1			1	2	2	2	2	2	1
199	2	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
200						1	1	2	2	2	2	2		1	1	1	2	2	2	1
201														1	2	2	2	2	2	1
202	2	2	2	2	2	1	1	2	2	2	2	2		1	1	1	2	2	1	1
203						2	1	1	2	2	2	1		1	1	2	2	1	2	2
204						1	2	2	2	1	2	2		1	2	2	2	2	2	1
205	2	2	2	2	2		2	2	2	2	1			1	2	2	2	2	2	1
206														1	2	1	2	2	2	1
207	2	2	2	2	2	1	1	2	2	2	2	1			1	2	2	1	2	2

Table G.1. Continues

NO	V23_1	V23_2	V23_3	V23_4	V23_5	V23_6	V24	V24_1	V24_2	V24_3	V24_4	V24_5	V24_6	V25	V26_1	V26_2	V26_3	V26_4	V26_5
1																			
2							1						6	1	5				
3	30000	500	10000	100	2	300	6	1	6	1	6	5	6	1	5	5	4	4	4
4		200	5000	100	3		3		6		5		4	2	4	4	2	4	4
5	2000				1						0	0	0	1	4	4	4	4	3
6					1		2				6		5	1	5	5	5	5	5
7		500		100		100	3	6			6		6	1	5	5	5	5	5
8	85000	60	20000	45	3		4	6	5	3	4			3	5	5	5	5	4
9				0			2				6		6	2	4		2	2	4
10							6	6	6	2	4	4	4	2	4	3	5	5	4
11							6	6	5	5	6	6	6	1	5	4	4	4	2
12			20000				4	6	3		5		4	1	1	1	5	1	2
13							5	6	4	5	6		6	1	5	5	2	2	5
14					2		1		6					3					
15							2				6		5	1	3	3	5	5	5
16		150	40000	150	1		6	6	2	1	6	6	6	1	1	5	1	0	4
17														1	1	5	1	5	1
18							3	6	5				4	3	4	4	4	4	3
19	70000	120	20000	50	3	30	6	6	6	1	6	1	6	1	4	3	4	5	2
20	50000	50	15000	15	2	50	5	6	5	5	6		6	1	3	2	3	2	3
21							6	2	2	1	6	2	6	1	5	3	5	4	5
22														1		4	4		3
23							6	6	3	1	6	5	4	1	2	3	1	2	5
24					2		6	6	5	4	6	6	6		3	3	3	3	3
25							6	6	4	3	6	5	4	1	4	2	3	4	4
26							6	6	1	1	6	6	4	1	5	3	3		3
27							3	5			6		6	1	5				
28		300	3000	200		300	6	6	1	4	6	5	4	3	1	5	5	1	3
29							6	6	4	1	6	3	1	3	2	3	2	2	3
30					2		6	6	5	1	6	3	6	1	5	2	3	5	5
31	80000	500	20000	300	3	1000	6	1	1	1	6	6	1	1	5	5	5	1	1
32							2			6	6			1	1		5	1	1
33	100000	250	10000	100	3		5	6	5	3	4		6	1	2		2	2	4
34		100					3	6			6		6	1	5	5	5	3	3
35														3	1	3	3	3	3
36	175000	200	100000	50	1	150	6	1	1	4	6	5	6	1	5	5	5	5	4
37	55000	250	10000	250	3	100													
38	90000	40	20000	15	2	10	6	1	1	1	6	6	6	2	5	5	5	1	4
39							6	4	1	5	4	1	1	1		2	3	4	3
40							6	6	1	1	6	6	4	1					
41							6	1	1	2	1	1	6	1	5	2	4	5	4
42							6	3	1	6	6		1	1	1	4	2	4	4
43							3	5			6		6	1	4	4	3	3	5
44							6	6	5	3	6	6	3	1	3	4	3	2	3
45							6	6	6	1	1	1	4	2	5	5	5	1	5
46							3	6			6	6		1	3	2	2	3	3
47					1		1						6	3	3	4	4	4	4
48			15000	100	2	50	6	5	5	4	6	1	6	1	5	5	2	2	2
49	5000	50	1000	20	1	50	6	1	1	1	3	1	6	1	4	4	5	4	4
50	70000		10000				5	5	4	1	0	6	5	3	4	5	3	4	3
51	70000						1						6	1					
52							3	6			6		6	1	2	5	5	1	0
53			10000				6	6	1	1	1	5	1	3	1	5	4	3	1
54					1		2		6				6	2	1	1	5	1	1
55	20000	100	10000	50	3	20	6	1	5	1	1	1	6	1	5	3	5	5	5
56	80000	500	20000	200	3	200	6	6	6	2	2		2	3	5	5	1	2	1
57							5	6	5	1	1		4	2	5	5	5	4	5
58	40000	70	30000	100	1	50	6	4	5	6	1	1	1	1	5	5	5	1	5
59	30000	90	5000	50	2	30	6	4	3	1	5	2	6	3	4	5	3	3	2
60	80000	100	7000	10	3		5	1	1		1	1	1	1	5	5	5	1	1
61							6	6	5	1	6	2	6	1	1	5	5	2	5
62					3		6	6	5	4	6	5	5	1	2	3	2	3	3
63							4	6	5	4	6			1	2	5	3	2	4
64							6	6	1	1	1	1	1	1	5	4	4	1	5
65	50000	100	30000	50	1	50	6	6	5	4	1	1	1	2	5	5	4	2	2
66			300		2		6	1	2	4	6		5	3	4	5	5	2	4
67							6	6	5	4	6	1	4	1	1	1	4	1	4
68	120000				3		2						6	1	1	1	2	2	3
69							6	6	6	5	6	4	6						
70						0	3	6	6				6	3	3	3	3	3	3
71		100	5000	50	3	50	5	1	1	6	6		1	1	5	5	5	5	4
72					1		1	6						3	4	5	5	2	4
73														2					
74														3	2	5	5	4	4
75		40	6000	20	2	20	4	6	6			6	6	1	2	4	5	2	5
76							1				6			1		5			
77					3		1						4	1					
78		500			3		6	6	5	1	6	1	6	1	1		5	4	5
79							6	4	3	2	5	1	6	1	2	4	2	2	3
80							3			4	6		5	1	4	2	2	2	2
81							3			4	6		5	1	4	2	2	2	2
82							3			4	6		5	1	4	2	2	2	2
83							3			4	6		5	1	4	2	2	2	2
84							6	6	1	1	6	1	1	1	5	3	5	5	2
85							6	1	1	1	6	1	5	3	3	3	3	3	3
86		50	50000	30	3	80	5	5	1	1	6		6	1	1	4	2	2	2
87							2		6		6		0	1	5	5			3
88	70000	50	25000	50	1		3	5	6				6	1	4	5	5	5	5
89													0	3					
90					3		3	6		6			6	2					
91					1		6	1	2	3	6	6	1	1	1	5	5	1	3
92	200000	50	60000	100	1	100	6	6	3	5	6	6	6	1	4	5	4	4	4
93	50000	400	20000	400	3	800	6	6	5	1	6	3	6	1	5	5	4	3	4
94	80000	50	7000	50	2	50	6	6	6	6	6	6	6	3	5	5	5	5	3
95							3		6	1			1	3	5	5	5	5	5
96	25000	150	2000	100	1	250	6	6	5	6	6	6	6	1	5	5	5	5	5
97							6	6	6	3	6	6	1	1	5	5	5	1	5
98							6	5	4	1	6	3	2	1	3	2	2	3	2
99	150000	120	40000	10	3	0	5	1	1	1	6	1	6	1	5				
100							1	6							3				
101	30000	100	20000	15	3	50	6	6	3	1	3	6	4	3	4	2	1	3	2
102														1	4	3	2	1	4

Table G.1. Continues

NO	V23_1	V23_2	V23_3	V23_4	V23_5	V23_6	V24	V24_1	V24_2	V24_3	V24_4	V24_5	V24_6	V25	V26_1	V26_2	V26_3	V26_4	V26_5
103	60000				2		6	1	1	1	1	1	6	3	5	5	5	5	5
104	100000	100			3	10	1				1			3					
105					2	250													
106							5	4	3	2	6	5		3					
107	100000	70	15000	100	3	120	6	5	6	1	6	1	6	1	1	5	5	1	5
108							2	6			6			1	1	1	1	1	0
109														1	3				0
110					3									1					5
111							2		5				6	3	2	3		1	4
112	1000	100	500		1		6	6	5	1	5	5	4	1	5	3	5	4	3
113		120		120		120	6	6	5	2	6	1	6	1	3	4	2	2	3
114	2000	40	1000		1	100	6	6	1	1	6	1	6	1	5	1	1	5	5
115		50												1	3	4	4	4	
116							3	6	6		6			1	5	5		5	
117	150000	100	20000	50	3	200	6	6	5	4	2	1	3	1	4	5	2	4	4
118							6	5	3	1	6		6	1	3	3	2	2	3
119	150000						1	6							4	5	5		5
120							2				6		6	1	3	3	4	4	3
121		30	2000				3		3	1	6		6	1	1	5	5	5	5
122					3		6	6	6	5	6	1	6	3	5	1	5	5	5
123					2	50	1			6				2	2	5	5	1	5
124	30000	25	150		2		6	2	5	1	6		6	3	1	1	5	3	3
125														1	4	2	1	2	4
126		500			2														
127	30000	250	15000	100	2	300	6	6	3	4	6	6	5	1	1	2	4	1	2
128	2000	0	1000	0	1	0	6	6	3	2	1	1	1	1	5	4	4	3	5
129							6	6	3	5	6	6	2	3	2	2	3	2	4
130	100000	50	20000	50	1	30	6	1	1	4	6	6	5	1	1	5	5	2	5
131	70000	50	20000	30	1	30	6	2	1	1	5		6	3	5	5	3	2	3
132	90000	70	40000	20	3		6	1	1	1	6	1	6	1	1	5	5	1	5
133			15000		2		2	6				6	0	1	5	4	2		2
134	50000	200	20000	150		75	5	6	5	5	6		6	1	5	5	5	5	5
135	120000		20000		2		3			5	6		5				5		
136							5	1	2	1	6		6		1	5	5	1	5
137	80000	200	5000				2				6		6	1	5	2	5	2	5
138							1						6	1	5	5	2	2	2
139	10000				2		1	6						3	1	1	4	5	4
140	150000	200	50000	100	1	125	6	1	6	6	1	6	3	1	2	2	3	2	3
141							1				6			1					
142							1				6			1					
143							2				6		5	1	1	5	4	1	4
144	100000		10000		2		6	2	4	3	6	1	5	1	4	4	4	3	4
145					2		6	4	3	1	6	6	6	1	5	1	1	1	3
146							4	6	5	4	4								
147																			
148																			
149							4	6		1	6		6	1					
150		40	10000	30	3		6	6	6	1	1	1	6	2	5	5	5	5	5
151	100000						6	6	1	1	6	1	6	2	5	5	5	2	3
152																			
153																			
154																			
155		200					1	5	5	5	5	5	6	1			4	3	
156			19000		1		6	1	1	1	6	5	6	1					
157							2	6			5						1		
158		200	10000	100	3	50	2	6			6			1	5	1	5	5	5
159																			
160		200		200	3	500	6	6	1	1	6	6	6	1	5	5	4	4	1
161	80000	100	25000	50	2		2	6	6					3	1	1	2	1	4
162							6	2	5	4	3	5	6	3					
163							2	6				6							
164					3		6	4	6	1	3	6	6	1	3	2	3	2	5
165														1	3	3	4	3	4
166	500	20		10	1	100	6	6	3	1	6	4	1	1	1	1	1	5	3
167							1	6						2	1	5	4	3	3
168	50000	750	10000	250	3														
169	40000	200	3000	100	2	100	6	6	3	2	4	4	1	3					
170																			
171	10000	250	750	100	1	100	6	6	5	4	3	2	5	3	2	4	2	2	4
172	50000	50	5000	10	1		6	6	4	5	3	5	1	2	3	3	4	2	4
173		250		250	3		5	6	5	1	6		6		1	2	3	1	1
174		40	20000				1	6						3	4	4	4	2	5
175														3	5			1	
176					3										5	4	4	5	2
177		100	80000		3		2				1		1	1	1	1	1	2	2
178	50000	150	100000	100	3	50	5	6	5	4	6		6	1	2	1	4	1	4
179	100000	200	30000	100		200	3		5		6		1	3	5	5	4	4	3
180	150000	300	50000	500	3	150	6	6	3	1	5	1	1	1	5	5	5	2	2
181							3	6			6		6	1	1		5	1	4
182	150000				3		3				6	6	6	1	2	2	2	2	2
183						200	1				0	5	6	1	5	3	2	2	4
184															5	2	1	5	
185	150000	150	25000	25	1	200	6	6	1	1	6	4	6	1	5	5	4	2	4
186							6	6	5	3	6	6	6	1		2	4	3	4
187	50000	150	5000		1		2				6		6	3	4	3	2	4	4
188																			
189																			
190	200000	100					3	6			6		6	1	5	5	4	2	4
191							6	6	5	5	6	4	3	1	2	4	4	2	4
192	20000	50	10000	50	2		6	6	5	1	6		6	1	4	3	5	3	3
193							6	6	6	1	5	4	4	1	1	5	1	1	1
194	50000	150	10000	50	1	100	6	6	3	2	5		4	1	5	5	4	2	2
195							4	5	5		1		1	1					
196																			
197																			
198		150	40000	75	3	300	3	5			6		6	1					
199	30000	50	2000	10	2	10	6	2	3	5	6	4	2	1	2	1	5	2	4
200	50000	30	10000	10	3	10	5	6	1	2	6		6	2	4	4	5	5	5
201	50000	30	10000	10	3	10	5	6	1	2	5		6	2	4	4	4	4	5
202	55000	250	7000	125	3	350	6	6	5	4	5	5	6	1	5	3	3	5	5
203	200000						2				5		6	1	3	4	1	1	3
204					3		1						6	3	5	1	5	5	5
205	75000				2									1	4	4	4	4	2
206		300			3		5	6	1	6	6		6			5	3	3	4
207		90					3	6			6		6	1	5	5	5		3

Table G.1. Continues

NO	V26_6	V26_7	V26_8	V26_9	V27_1	V27_2	V27_3	V27_4	V27_5	V27_6	V27_7	V27_8	V28_1	V28_2	V28_3	V28_4	V28_5	V28_6	V28_7	V28_8	V28_9
1													5	5	4						
2					5								5		0						
3	4	5	4	5	4	5	2	5	5	5	5	4	5	5	4	5		4	2	2	1
4	5	4	5	5	5	3	3	4	5	4	4	4	4	4	4	4	4	3	5	5	4
5	3	4	4	4	4	4	5	4	4	4	4	4									
6	5	5	5	5	5	5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5
7	5	5	5	5	5	5	3	5	5	2	5	2	5	5	4	5	5	5	5	5	5
8	4	4			5	5	4	5	5	4	4	4	4	4	4	4	4	3	2	4	2
9	3	2	3	3		4	5	2	4	3	3	3	2	2	2	2	2	2	2	2	2
10	4	3	4	3	4	4	3		5	2	4	3	5	5	3	1	1	1	4	3	4
11	4	4	4	4	5	4	2	4	4	4	4	4	5	4	4	2	2	2	4	4	4
12	5	5	2	5	5	5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5
13	2	5	2	5	5	4	3	4	4	2	2	2	5	5	2	2	2	2	2	4	2
14					4	1	3	4	4	1	4	4	5	5		3	3	3	4	3	3
15	4	5	4	5	5	2	3	5	5	5	5	5	3	3	4	3	3	3	3	4	4
16	4	4	1	2	4	5	3	4	2	3	3	3	5	5	5	5	5	5	2	2	5
17	2	5	3	4	4	4	3	4	3	2	1	5	5	5	5	5	5	5	5	5	5
18	4	4	3	4	4	2	3	4	4	3	2	4	2	3	4	4	3	3	2	4	2
19	5	4	2	5	5	5	3	4	4	2	4	2	5	4	5	4	5	4	5	2	5
20	3	4	4	2	3	2	3	3	4	3	0	3	4	4	4	4	4	4	2	2	4
21	4		3	4	5	5	3	4	5	3	4	4	4	5	5	4	1	4	4	1	4
22		4	3				4	3		2	5	3	4	4	0	3	2	2	4	2	2
23	3	4	5	1	5	4	3	5	4	3	4	5	3	4	2	1	1	2	3	2	4
24	3	3	3	3	0	4	3	5	3	3	3	5	5	5	5	5	3	3	5	5	5
25	4	5	3	4	5	5	3	5	5	5	5	5									
26	3	3	3	3									5								
27				5		5	2	0	5	5			4		4		2	2	4	5	
28	4	2	2	4	4	4	4	4	4	2	4	2	4	4	4	4	4	4	4	4	4
29	3	2	2	3	5	2	3	5	4	3	3	3	2	3	2	3	2	2	2	2	3
30	5	5	5	3	4	2	5	5	5	5	5	5	4	4	2	1	3	4	5	5	5
31	1	1	5	1	1	5	5	5	5	1	1	1	5	5	5	1	5	5	5	5	5
32		1	1	1	1	5	5	5	5	0	5	5	5	5	5	5	1	1	5		5
33	4	5	4	3	5	4	4	4	4	4	4	4	4	4	3	4	3	2	2	4	4
34	3	3	3	4		5	1		5	1	3	3	5	5	5	5	5	5	5	2	5
35	4	5	3	3	4	5	3	4	3	4	4	4	3	3	3	3	3	3	3	3	3
36	4	2	1	5	5	5	1	4	5	3	2	1	5	5	5	5	5	5	5	5	5
37									0	0	0	0	4	5	1	5	3	1	2	2	2
38	1	4	2	5	2	4	5	5	5	2	2	1	4	4	5	2	2	1	2	2	1
39	2	4	5	3	5	4	3	5	5	3	4	5	4	5	1						
40									0	0	0	0	5	5	4	5	5	5	5	5	5
41	4	5	4	4	4	4	3	4	4	4	4	4	5	4	4	4	4	2	4	2	2
42	4	4	4	4	5	4	3	5	4	4	5	1	5	4	5	4	5	4	4	4	4
43	4	5	2	3	4	4	3	4	4	3	4	4	4	4	4	4		3	3	4	4
44	3	4	2	4	4	4	3	4	4	3	4	4	4	3	4	0	3	3	4	4	3
45	1	1	1	5	5	4	5	5	5	5	5	1	1	1	4	4	1	1	4	5	1
46	3	4	3	4	4	4	4	4	4	2	3	3	5	5	5	4	4	4	3	4	3
47	4	4	4	5	5	5	2	2	4	4	3	4	5	3	2	4	2	2	3	3	3
48	2	2	2	3	4	4	3	2	2	2	2	2	5	5	5	5	4	4	4	4	4
49	2	3	3	3	1	4	3	4	4	4	0	4	4	4	4	4	3	3	4	4	3
50	4	5	5	4	4	4	4	5	5	4	3	4	2	4	3	4	5	3	4	1	4
51									0	0	0	0	5	4	5	5	5	4	4	4	5
52	5	5	5	3	5	5	1	5	5	5	5	5	5	5	4	5	1	1	5	1	5
53	1	5	1	4	4	2	5	4	4	4	1	4	2	2	4	2	2	2	2	2	2
54	1	5	5	1	1	1	5	5	5	5	5	5	1	1	5	5	1	1	1	1	1
55	1	5	1	1	2	2	4	1	5	1	5	4	2	2	2	1	1	1	1	2	1
56	1	1	3	3	1	4	2	5	5	5	5	5	3	2	4	5	3	5	5	4	4
57	4	4	5	3	4	4	5	4	4	4	4	0	1	2	4	1	2	2	4	2	2
58	1	1	5	5	5	4	5	5	5	1	3	3	5	5	5	5	5	5	1	1	5
59	3	3	4	3	4	4	3	4	4	4	5	3	5	5	3	4	2	3	4	4	3
60	5	1	1	1	1	5	5	5	5	1	1	1	5	5	5	1	5	5	5	5	5
61	1	5	5	5	5	1	4	4	5	4	4	5	4	4	1	5	4		4	5	4
62	3	4	2	2	4	4	1	3	4	3	4	3	5	4	3	3	5	4	5	4	2
63	4	4	4	5	5	5	3	3	5	5	5	4	5	5	5	5	5	5	5	5	5
64	2	2	1	5	5	5	5	5	5	5	5	5	5	5	5	1	1	1	1	1	5
65	3	4	2	3	5	3	5	1	1	1	1	1	1	1	5	1	1	1	1	1	1
66	4	4	3	4	5	4	3	4	2	1	4	4	4	4	5	4	2	1	1	2	3
67	2	4	1	5	4	2	3	2	2	3	3	3	3	3	3	3	2	2	5	5	4
68	4	4	3	2	5	5	3	4	4	1	1	5	5	5	5	5	5	5	5	5	5
69													3	4	3	3	3	3	3	3	3
70	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	2	4	3	2
71	3	5	5	5	5	2	3	5	5	5	5	5	5	5	5	5	5	5	4	4	5
72	4	4	4	4	5	2	3	4	4	4	4	4	2	3	2	2	2	2	2	2	2
73									0	0	0	0	0	0	0						
74	4	4	4		5	2	4	5	5	5	5	5	4	4	5	4	2		2		
75	4	5	2	2	2	4	5	5	1	1	2	2	5	4	4	5	5	5	5	5	5
76		5		5	5			5	0	0	0	0	0	5	0	5					
77									0	0	0	0	0	0	0						
78	5	5	1	5	5	3	2	5	5	5	3	5	5	5	4	5	5	4	2	4	4
79	4	5	4	4	5	3	3	4	4	4	4	4	3	3	4	3	3	3	3	3	3
80	4	4	4	4	4	4	3	4	4	2	2	4	5	5	5	5	5	5	5	5	5
81	4	4	4	4	4	4	3	4	4	2	2	4	5	5	5	5	5	5	5	5	5
82	4	4	4	4	4	4	3	4	4	2	2	4	5	5	5	5	5	5	5	5	5
83	4	4	4	4	4	4	3	4	4	2	2	4	5	5	5	5	5	5	5	5	5
84	4	4	5						0	0	0	0	5	4	3	4	4	2	4	3	3
85	3	4	3	3	4	1	2	4	4	4	4	2	4	4	4	4	4	4	4	3	3
86	2	2	4	2	4	4	3	2	2	2	2	4	5	5	5	5	5	5	5	5	4
87	4	5	5	5	5	3	3	4	5	5	5	5	5	5	5	5	4	3	3	3	5
88	5	5	5	5	5	4	4	5	5	5	5	5	5	4	4	4	4	4	4	4	4
89									0	0	0	0	3	3	0						
90									0	0	0	0	3	3	3	3	3	3	3	3	3
91	3	3	4	3	3	4	5	4	4	4	5	5	3	4	4	2	2	2	2	2	3
92	5	4	5	4	4	4	4	4	5	4	5	2	5	5	5	5	4	4	5	2	2
93	2	4	5	2	5	4	3	5	5	5	4	5	5	5	5	5	5	5	5	5	5
94	5	5	3	3	5	2	3	4	3	5	5	5	5	5	5	5	5	5	5	5	5
95	5	1	5	1	5	1	5	5	5	1	1	5	0	5	5	5	1	1	1		5
96	5	5	5	5	5	5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5
97	1	5	5	5	5	5	5	5	5	1	1	5	5	5	5	5	5	5	5	5	5
98	2	3	5	2	4	4	3	4	4	4	3	4	5	4	3	4	4	3	4	3	2
99									0	0	0	0	5	5	5	5	5	5	5		1
100			5						0	0	0	5	4	4	0	4	4		4	4	
101	3	2	3	2	3	2	4	4	5	4	3	3	4	4	4	3	4	2	3	3	4
102				3				4	0	0	0	4	4	4	5	4	4		3		3

Table G.1. Continues

NO	V26_6	V26_7	V26_8	V26_9	V27_1	V27_2	V27_3	V27_4	V27_5	V27_6	V27_7	V27_8	V28_1	V28_2	V28_3	V28_4	V28_5	V28_6	V28_7	V28_8	V28_9
103	5	5	1	3	5	5	1	5	1	1	1	4	3	3	3	3	3	3	3	3	3
104					4	1	5	4	5	2	1	2	5	5	5	2	3	3	4	3	4
105									0	0	0	0	0	0	0						
106									0	0	0	0	1	2	1	2	2	1	3	3	
107	5	5	5	5	5	5	1	5	5	5	5	5	5	4	4	5	5	4	5	2	4
108	4	5	5	5	5	2	1	2	5	5	4	5	5	5	5	5	5	5	5	5	5
109					3				0	0	0	0	4	0	0						
110					5			5	5	0	5	0	3	0	0						
111	5	5	5	5	5	2	3	4	5	5	5	5	3	3	3	3	2	2	2	1	3
112	3	4	2	4	4	5	3	4	4	3	4	3	5	4	5	4	4	4	2	2	3
113	5	4	3	3	4	4	3	4	4	4	4	4	4	4	4	2	4	3	4	4	3
114	5	5	5	1	5	5	5	5	5	5	5	5	5	5	5	1	5	2	5	5	5
115		4	2	4	0	4	2	4	0	2	3	2	4	4	4	4	4	4	2	2	
116	5	5			5			5	0	5	5	5	5	5	5	5	5	4	5	4	
117	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	3	3	4	4	4
118	5	5	3	3	0	5	3	3	5	3	0	5	3	3	4	3	3	2	2	2	3
119	5	0	5	5	4	4	2		4	4	4	4	4	4	0	4	0	4	4		4
120	3	4	4	2	4	4	4	5	4	4	4	2	4	4	4	4	4	4	3	2	4
121	5	5	1	5	5	2	3	3	3	4	5	5	5	5	5	5	5	5	5	5	3
122	1	5	5	1	5	1	3		5	2	2	5	5	5	5	5	5	5	5	5	5
123	3	1	1	5	5	2	4	5	5	5	5	5	4	4	4	1	4	1	4	4	2
124	3	5	5	3	5	4	3	5	5	4	4	4	4	4	4	4	3	3	3	4	3
125	4	3	0	2	0	3	3	5	4	4	4	4	4	4	4	4	3	3	4	3	4
126									0	0	0	0	0	0	0						
127	1	3	1	5	5	5	3	2	2	1	1	1	5	5	5	2	5	5	2	2	5
128	4	5	5	2	5	4	3	2	1	5	4	3	5	4	5	3	5	1	3	2	4
129	4	4	3	5	5	4	1	3	2	3	3	3	4	4	3	5	2	3	2	2	3
130		3	5	3	5	4	5	2	3	0	4	1	5	5	5	5	5	5	5	5	5
131	3	2	5	2	4	4	4	4	4	4	4	3	3	4	2	2	3	3	3	4	3
132	5	5	1	3	5	5	1	1	1	1	5	1	5	5	5	3	5	3	1	3	5
133		2			5	2	4	5	5	5	5	5	5	5	2	2	2	2	5	5	5
134	5	5	5	5	5	5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5
135		5							0	0	0	0	5	4	4	5					
136	3	5	1	3	5	5	1		1	1	1	1	0	5	5						
137	2	5	2						0	0	0	0	5	5	5	5					4
138	2	2							0	0	0	0	4	4	4	2	2	4	4	2	4
139	2	5	3	3	5	4	5	5	5	5	4	3	4	4	3	2	3	3	2	4	3
140	2	4	2	4	5	4	3	5	1	4	4	1	4	4	4	4	3	3	4	4	3
141									0	0	0	0	2	0	4						
142									0	0	0	0	2	0	4						
143	4	4	4	4	5	2	4	4	4	4	3	4	5	5	5	4	4	4	4	3	4
144	4	4	3	2	4	2	2	3	3	4	4	4	4	4	4	4	4	4	4	3	5
145	5	5	3	2	4	2	3	4	2	3	4	4	4	4	4	4	5	4	4	3	4
146									0	0	0	0	2	4	2	2	2	2	2	3	2
147									0	0	0	0	5	4	4	4	4	0	2	4	4
148									0	0	0	0	0	0	0						
149									0	0	0	0	0	0	0						
150	4	5	5	5	5	5	5	1	1	1	1	1	0	0	0						
151	4	4	5	5	5	5	4	3	5	1	4	1	0	0	0						
152									0	0	0	0	0	0	0						
153									0	0	0	0	0	0	0						
154									0	0	0	0	0	0	0						
155		5	5		5	4	3	5	5	5	0	4	4	4	5	4	4	3	4	4	4
156		5	5	5					0	0	0	0	0	0	0						
157							4		0	0	5	0	4	4	4	4					
158	5	5	5	5					0	0	0	0	0	0	0						
159									0	0	0	0	0	0	0						
160	1	5	1	5	5	4	5	4	5	1	5	1	5	5	5	5	5	2	4	4	4
161	4	3	2	3	5	5	3	3	3	4	4	4	5	5	4	5	5	4	4	4	4
162									0	0	0	0	0	0	0						
163									0	0	0	0	3	2	4	2	3	2	2	3	0
164	4	5	5	4	5	2			5	4	0	0	5	4	0						
165	5	5	3	3	4	4	3	5	0	5	5	5	4	4	4	3	3	3	4	4	4
166	2	1	5	3	5	1	1	3	3	1	1	5	5	5	5	5	5	5	5	5	1
167	5	5	3	3	3	4	1	5	4	3	4	3	3	3	3	2	1	1	2	1	1
168									0	0	0	0	0	0	0						
169									0	0	0	0	0	0	0						
170									0	0	0	0	0	0	0						
171	4	4	3	2	4	4	4	3	0	0	0	0	0	0	0						
172	4	4	3	4	4	2	4	4	4	4	4	2	2	3	2	2	2	2	2	3	
173	1	1	1	1	2	5	3	3	4	4	4	3	5	4	4	4	3	3	4	4	5
174	5	5	5	5	4	5	3	4	5	4	4	4	2	4	5	3	1	1	4	5	3
175		4			5	5	5		4	1	5	5	4	5	4	3	1	1	1	1	1
176	4	5	4	2	5	5	3	4	0	4	4	4	5	4	4	5	5				
177	2		1	1	4	4	2	4	4	3	3	3	4	4	4	4	3	2	3	2	4
178	5	5	5		5	5	5	5	4	4	4	4	5	5	5	5	5	5	5	5	5
179	4	4	4	4	5	3	3	5	5	2	3	3	3	3	3	3	3	3	3	3	2
180	2	4	5	5	5	5	4	5	5	2	2	5	5	5	5	5	5	5	5	5	5
181	4	4	1	5	5	4	4	5	2	4	4	4	4	4	4	1	2	2	4	4	4
182	2	2	2	2	5	5	2	5	5	5	5	5	5	5	5	5	5	5	5	5	5
183	3	3	2	2		2	4	5	5	5	5	5	4	4	4	2	2	2	5	4	2
184	5	5	5	5	5	2	1	5	2	2	2	2	5	5	5	5	5	5	5	5	5
185	5	5	5	4	5	3	3	5	5	3	4	4	5	5	5	5	5	3	3	3	5
186	4	5	4	4	5	4	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5
187	5	4	4	3	5	5	1	5	5	5	5	5	4	4	4	4	4	4	4	4	4
188									0	0	0	0	0	0	0						
189									0	0	0	0	0	0	0						
190	4	4	2	5	5	4	4	5	4	4	4	4	5	5	5	4	5	5	4	2	4
191	4	4	3	4	4	4	3	4	4	3	4	4	3	3	4	3	2	2	3	3	1
192	2	1	1	5	5	5	5	5	1	1	1	1	2	2	2	1	1	1	1	1	1
193	1	3	5	3					0	0	0	0	0	0	0						
194	2	3	3	5	4	2	3	2	2	2	4	2	4	4	4	4	4	4	4	4	3
195									0	0	0	0	0	0	0						
196									0	0	0	0	5	0	0						
197									0	0	0	0	0	0	0						
198									0	0	0	0	0	0	0						
199	2	4	4	2	4	4	3	4	2	2	2	4	4	4	4	4	4	3	4	4	4
200	5	5	5	5	4	3	3	4	4	4	4	4	3	3	4	3	3	3	4	3	3
201	5	5	5	5	4	3	3	3	4	4	4	4	3	3	0	3	3	3	3		3
202	3	5	3	3	5	3	3	4	5	5	5	5	4	5	4	4	3	3	4	4	3
203	3	5	5	5	5	5	3	3	5	3	5	5	5	5	5	5	5	3	2	2	5
204	5	5	1	5	5	1	1	5	5	5	5	5	3	5	5	1	1	1	4	4	3
205			4	2	5	4	3	4	5	5	5	5	5	5	4	4	4	4	5	5	4
206	5	4	4	3	5	5	3	5	5	1	5	4	4	4	4	4	4	2	2	3	3
207	3	3	4	5	5	5	3	5	5	5	5	0	5	3	5	2	4	3	5	4	5

Table G.1. Continues

NO	V28_10	V28_11	V28_12	V28_13	V28_14	V28_15	V28_16	V28_17	V28_18	V29_1	V29_2	V29_3	V29_4	V29_5	V29_6	V29_7	V29_8	V29_9	V29_10
1																			
2										5									
3	2	2	1	2	1	2	2	1	2	5	5	5	4		5	4	3	5	4
4	4	4	4	2	4	4	2	4	2	5	5	5	5	5	4	4	3	3	4
5																			
6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
7	5	5	5	5	5	2		5	4	5	5	5	5	5	5	5	0	5	5
8	4	4	4	2	4	4	2	5	2	5	5	5	5	5	2	3	1	3	5
9	3	2	2	4	4	3	2	2	2		5	4	0	1	2	2	1	2	3
10	4	1	5	3	5	5	1	3		4	4	5	5	3	1	1	1	3	4
11	4	4	4	4	5	5	4	4	3	4	4	5	4	4	1	1	1	3	4
12	5	5	5	1	1	1	1	5	1	5	5	5	5	2	2	5	2	5	5
13	2	5	5	5	5	2	2	4	2	5	5	5	5	4	2	2	2	2	5
14	5	4	4	3	5	2	2	4	1	5	4	3	4	3	3	3	3	2	4
15	4	4	3	3	3	3	2	3		3	3	3	3	3	3	3	3	3	3
16	3	4	5	4	3	2	1	5	1	4	5	5	5	4	4	5	3		4
17	5	5	5	2	5	2	2	5	2	4	4	5	5	5	3	3	1	3	4
18	3	3	4	4	4	4	4	4	2	4	4	3	4	4	4	2	2	3	
19	3	5	5	4	4	2	2	5	2	4	4	3		4	2	3	2	5	5
20	3	4	3	2	4	3	2	2	2	5	5	4	4	5	3	3	2	4	4
21	4	4	4	4	4	3	3	3		5	5	5	5	4	4	2	1	1	1
22	4	4	4	2	4	4	3	4	2	4	4	4		4	1	1	1		3
23	3	2	4	3	1	5	3	2	4	2	4	1	4	2	3	1	2	1	2
24	5	5	5	5	5	3	3	5	3				5	5	2	2	2	2	3
25																			
26										5	5	4		3	3	3	1		1
27	5	4	5	5	5	5	1	5	2	5	5	5	5	2	1	1	1		4
28	4	4	4	4	2	2	2	2	2	4	4	4	5	4	2	2	2	2	4
29	3	2	2	4	2	4	2	3	2	2	2	3	3	2	2	2	2	2	4
30	5	5	4	4	4	4	2	5	1	5	5	5	4	1	1	3	1	2	4
31	5	5	5	5	5	1	1	5	1	5	5	5	5	5	5	5	5	5	5
32	5	5	5	5	5	5	1	5	1	5	5	5	5	5	1	1	1	5	5
33	2	4	4	4	4	3	2	4	2	4	4	4	4	4	4	3	3	3	4
34	5	5	5	5	5	5		5	2	5	5	5	5		3	3	3	5	5
35	3	3	3		4	4	3	4	3	3	3	4	4	3	3	3		2	3
36	5	5	5	4	5	2	2	5	1	5	5	5	5	5	2	3	3	5	5
37	2	4	4	2	4	4	2	4	2	3	5	3	4	3	2	2	2	3	4
38	4	3	3	4	4	4	2	4	1	5	5	2	4	4	2	2	2	4	4
39										1	1	1	1	1	5	5	5	1	1
40	4	5	5	2	4	5	1	5	1	5	5	5	5	4	4	4	4	3	5
41	4	4	5	2	4	4	2	5	5	4	4	4	4	4	4	2	1		
42	4	4	4	4	2	2	2	5	2	5	5	5	5	4	2	3	2	4	4
43	3	3	3	4	4	2	2	4	4	4	4	4	4	2	2	2	2	3	4
44	2	3	4	3	4	3	2	4	2	4	4	3	4	3	2	3	2	4	4
45	1	1	2	2	4	4	1	5	1	4	4	1	4	1	1	1	1	1	1
46	4	5	4	4	4	3	4	4	2	4	4	4	4	3	4	3	2	2	4
47	4	4	4	4	4	3	3	3		4	4	4	4	4	4	3	3	4	4
48	4	4	4	2	4	4	2	4	2	5	5	5	5	5	5	3	3	3	5
49		4	4	4	4	3		4	3	4	4	4	4	3	3	3	3	3	4
50	4	3	5	4	5	4	5	4	2	3	4	3	4	2	2	2	2	3	4
51	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4
52	5	5	5	5	5	5	3	5	1	5	5	5	5	5	1	1	1	1	5
53	2	2	2	4	3	4	3	2	3	4	4	3	4	2	2	2	2	2	3
54	5	1	5	1	1	5	5	1	5	5	5	5	5	1	1	1	1	1	1
55	1	1	1	1	1	1		3	5	1	1	1	1	1	1	1	1	1	1
56	3	5	4	3	5	4	3	5	5	5	5	5	5	3	3	2	2	3	5
57	5	2	5	5	2	4	4	4	2	4	4	4		1	2	1	1	1	4
58	5	5	5	5	5	1	1	5	1	5	5	5	5	4	5	4	2	5	5
59	4	4	4	3	4	3	4	4	2	4	4	3	4	3	3	3	2	3	4
60	5	5	5	5	5	1	1		1	5	5	5	5	5	5	5	5	5	1
61	3		5	4	5	1	3	4	1	5	5	5	5	2	1	1	1	1	5
62	4	4	5	2	2	2	2	4	2	4	4	2	5	4	3	4	3	3	4
63	5	5	5	3	5	3	4	5	2	5	5	5	5	5	5	5	5	5	5
64	5	1			5	5	1		1	5	5	5	5	5	1	1	1	1	5
65	2	1	5	3	5	5	1	4	1	5	5	5	5	1	1	1	1	1	4
66	3	2	2	2	2	4	2	4	2	4	4	4	4	2	2	2	1	2	2
67	4	2	2	2	5	4	1	3	1	5	5	5	5	5	2	1	1	4	4
68	5	5	5	5	5	0	2	5	5	5	5	5	5	5	5	5	3	3	5
69	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
70	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
71	4	5	5	2	5	1	1	5	1	5	5	5	0	5	4	5	4	5	3
72	2	2	2	4	2	4	2	2	4	4	4	4	4	2	2	2	2	2	2
73																			
74	5	4	4	4	5	2	2		5	5	5	3	3	3	2	2	2	2	5
75	3	5	5	5	4		4	5	2	2	4	4	4	2	1	1	1	1	2
76	5	5	0	5	5	5		5			5								
77															5				
78	4	5	2	2	4	3	1	3	2	4	5	4	5	3	2	5	3	2	3
79	3									4	4	4	4	3	2	2	2	3	4
80	2	5	5	2	5	2	2	5	5	5	5	5	5	2	5	5	5	5	5
81	2	5	5	2	5	2	2	5	5	5	5	5	5	2	5	5	5	5	5
82	2	5	5	2	5	2	2	5	5	5	5	5	5	2	5	5	5	5	5
83	2	5	5	2	5	2	2	5	5	5	5	5	5	2	5	5	5	5	5
84	4	4	4	2	3	4	2	2	2	5	5	5	5	2	2	1	1	4	4
85	4	4	4	4	4	3	1	4	2	5	4	4	4	4	3	4	4	4	4
86	4	4	4	4	2	2		5	1	5	4	4	4	4	4	4	2	4	4
87	5	5	5	5	4	5	4	5	4	5	5	5	5	3	3	3	3	3	4
88	5	5	5	4	4	4	4	5	4	5	5	5	5	5	4	4	3	3	5
89																			
90	3	3	3	3	3	3	3	3	3										
91	2	2	3	4	3	3	3	3	3	4	4	3	4	3	2	2	1	3	3
92	4	2	5	4	4	1	1	5	4	5	4	5	2	5	2	2	2	4	4
93	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	4	4	5
94	5	5	5	5	5	5	2	5	3	5	5	5	5	4	1	1	1	1	5
95	5	5	5	5	5	5	1	5	1	1	5	5	1	1	1	1	1	5	5
96	5	5	5	5	5	5	1	5	1	5	5	5	5	5	5	5	5	5	5
97	5	5	5	5	5	1	1	5	1	5	5	5	5	5	5	5	5	5	5
98	2	4	4	4	2	4	2	4	2	5	5	4	4	2	3	2	2	3	2
99																			
100		4	5		4	4	4	4	4	5	5	5	5	3	3	5	4	3	5
101	5	3		2	4	0	4	3	4	4	4	4	4	2	1	2	1	4	4
102		4	5	4	0	2	2	4	3	2	4	4	4		3	3	2		

Table G.1. Continues

NO	V28_10	V28_11	V28_12	V28_13	V28_14	V28_15	V28_16	V28_17	V28_18	V29_1	V29_2	V29_3	V29_4	V29_5	V29_6	V29_7	V29_8	V29_9	V29_10
103	3	3	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5	5
104	3	1	5	5	5	1	1	5	3	0	5			5		1	1	1	5
105																			
106																			
107	4	4	5	1	4	4	2	5	1	5	5	5	5	5	5	5	1	5	5
108	5	5	5	5	5	5	1	5	1	5	5	5	5	5	5	5	5	5	5
109																			
110																			
111	3	3	3	4	4	5	5	5	3	3	5	5	3	1	1	1	1	3	3
112	3	4	4	2	5	2	4	5	4	5	4	4	4	3	3	3	2	4	5
113	4	4	4	4	3	4	2	5	2	5	4	4	4	2	4	3	3	4	4
114	5	5	1	5		1	1	5	1	5	5	2	5	1	1	5	1	1	5
115	4		4	2	4	3	2				4	4			2	3	2	4	3
116			5			2			2	4	4			2	2				
117	2	4	4	4	4	2	2	4	2	4	4	4	4	2	2	2	2	4	4
118	3									4	4	4	4	3	3	3	2	3	4
119	4	4	4	4	4	4	4	4	4	4		4			4			4	
120	3	4	4	4	5	2	2	4	2	4	4	4	4	2	2	3	3	3	4
121	4	4	5	2	5	2	2	3	4	5	5	5	5	5	2	2	1	1	5
122	5	5	5	1	5	5	1	5	5	5	5	5	5	5	5	2	2	5	5
123	2	2	2	2	5	4	2	2	2	5	5	2	5	1	1	1	1	2	2
124	3	4	4	4	4	4	4	4	3	4	4	4	4	4	4	3	1	1	4
125	4	4	4	4	4	4	2	4	2	5	5	5	5		2	3	3	3	4
126																			
127	5	2	5	2	5	2	2	3	2	5	5	5	5	3	5	4	1	5	5
128	5	4	3	3	2	1	5	4	2	5	4	2	4	1	1	1	1	1	2
129	3	4	4	5	5	5	2	5	2	5	5	4	4	3	3	2	2	2	3
130	5	5	5	1	5	1	1	5	1	5	5	5	5	3	3	1	1	1	3
131	4	4	4	3	4	2	2	4	2	4	4	4	4	2	2	2	2	5	5
132	5	5	5	5	5	3	1	5	3	5	5	5	5	3	3	5	3	5	5
133	5	5	5	5	5	2	2	5	2	5	5	5	5	2	2	2	2	2	5
134	5	5	5	5	5	5	5	5	3	5	5	5	5	5	3	3	3	5	5
135		4	4		4	4	4	4			4		5						
136			5				1			5	5	5	5	5				5	5
137	4	4	4		4			4		4	4	4	4					4	4
138	0	4	4	4	4	2	2	4	2	4	4	4	4	4	4	4	4	4	4
139	2	3	4	4	3	4	2	3	3	4	3	2	4	3	3	1	1	1	4
140	4	4	4	2	1	4	4	1	4	5	4	4	5	3	2	2	2	2	4
141										4	4	4	0	4	3	3			4
142										4	4	4	0	4	2	2			4
143	4	4	2	4	4	4		4	4	5	5	5	5	2	3	2	1		5
144	4	4	4	2	4	1	1	3	2	3	4	3	4	3	2	3	2	4	3
145	4	4	5	1	4	2	2	4	2	4	4	4	0	3	3	4	3	3	3
146	4	5	5							4	4	4	4	4	4	2	2	2	3
147	5	4	4			4	2	4	2	3	4	4							
148																			
149																			
150																			
151																			
152																			
153																			
154																			
155	4	5		4		4	4	2											
156																			
157	4		4		4		2	4	2	4	4	4							
158																			
159																			
160	4	4	4	5	4	2	2	4	1	5	5	4	4	2	4	4	1	4	4
161	4	5	5	4	4	3	4	3	4										
162																			
163	2	3		2		4	3		4	4	4	4	4	3	3	3	2	2	4
164										3	4				3			5	5
165	4	4	4	2	4	2	2	4	2	4	4	4	4	3	3	3	3	3	4
166	1	5	5	2	5	1	1	5	1	5	5	5	5	1	5	5	2	5	5
167	1	1	2	4	4	4	3	4	2	3	3	3	2	2	2	1	1	4	3
168																			
169																			
170																			
171																			
172																			
173	3	4	5	5	5	3	2	5	2	3	4	5	5	3	2	2	3	3	4
174	4	2	4	4	5	4	2	4	1	4	4	4	4	3	1	1	1	2	4
175	2	2	3	4	4	4	4	5	4	1	5	5	5	5	4	1	1		5
176																			
177	4	4	4	4	4	3	2	4	2	4	3	4	4	3	3	2	2	4	4
178	5	5	5	2	5	5	2	5	2	4	4	4	4	2	2	4	2	4	4
179	4	3	3	4	4	4	2	4	2	4	4	4	4	4	2	2	2	2	5
180	5	5	5	1	5	1	1	5	1	5	5	5	0	5	5	5	1	5	5
181	4	4	4	4	4	2	2	4	2	4	4	4	4	4	3	2	2	4	4
182	5	5	5	5	5	2	2	2	2	5	5	5	5	5	5	5	5	5	5
183	4	4			4	2	2	4	2	4	4	4	4	4	2	2	2	2	5
184	2	5	5	5	5	5	2	5	2	5	5	5	5	5	5	5	5	5	5
185	5	5	4	4	5	3	3	4	3	5	5	5	5	4	3	3	3	3	4
186	5	5	5	4	5	4	2	5	2	5	5	5	5	5	5	5	3	5	5
187	4	4	4	4	4	4	4	4	5	4	4	4	4	4	4	4	4	4	4
188																			
189																			
190	4	5	4	5	4	2	2	5	2	5	5	5	5	5	5	4	2	5	5
191	3	3	3	4	4	4	3	2	2	2	2	3	3	1	1	1	1	1	4
192	1	1	1	2	0	5	2	2	2	2	2	4	3	2	2	1	1	1	1
193																			
194	4	4	3	2	4	2	2	4	2	4	4	4	4	4	2	3	2	4	4
195																			
196																			
197																			
198																			
199	4	2	4	4	4	3	2	4	2	4	4	3	4	2	3	3	3	3	4
200	4	3	4	3	4	4	4	4	3	3	4	4	4	4	4	3	2	2	4
201		3	3	3	3	3	3	3	2		4	4	4	4	4	4	4	3	4
202	4	4	4	3	4	2	2	4	2	5	5	5	5	5	3	3	3	3	5
203	5	5	5	5	2	2	2	2	2	3	5	5	5	5	2	3	2		5
204	5	3	5	5	3	2	1	4	4	4	4	4	4	3	1	1	1	3	4
205	4	4	4	3	2	2	2	4	2	4	4	4	4	4	4	4	1	3	4
206		4	4	4	4	4		4		4	4	4	4	3	3	3	3	3	4
207	5	5	5	5	5	2	2	5	2	5	5	5	5	5	5	5	5	5	5

Table G.1. Continues

NO	V29_11	V29_12	V29_13	V29_14	V29_15	V29_16	V29_17	V30_1	V30_2	V30_3	V30_4	V30_5	V30_6	V30_7	V30_8	V30_9	V30_10	V30_11	V30_12
1								2	1	2	1	2	1	1	1	2	2	2	2
2																			
3	4	4	4	4	4	4	3	2	1	1	2	2	2	2	2	2	2	2	2
4	5	5	5	5	4	4	3	1	1	1	1	2	1	2	2	2	2	2	2
5																			
6	5	5	5	5	5	5	5	2	1	1	2	2	2	2	2	2	2	2	2
7	5	5	5	5	5	5	0	1	1	1	2	2	2	2	2	2	2	2	2
8	5	4	5	5	4	4	4	2	1	1	2	2	2	2	2	2	2	2	2
9	5	4	4	5	4	5	3	2	2	2	2	2	1	2	2	2	2	2	2
10	4	4	4	4	4	5	5												
11	5	5	5	5	5	5	4	1	1	1	2	2	2	2	2	2	2	2	2
12	5	5	5	5	5	5	1	1	2	1	2	2	2	2	2	2	2	2	2
13	5	2	5	5	5	2	2	1	1	1	2	2	2	2	2	2	2	2	2
14	5	4	3	3	4	4	2	2	1	2	2	2	2	2	2	2	2	2	2
15	3	3	3	3	3	3	3	2	1	2	2	1	2	1	2	2	2	2	2
16	4	4	4	5	5	5	3	1	1	2	2	2	1	2	2	2	2	2	2
17	4	4	4	4	4	4	3	1	1	2	2	2	2	2	2	2	2	2	2
18	4	4	4	4	4	4	3	1	2	2	2	2	2	2	2	2	2	2	2
19	4	4	5	5	4	5	1	1	2	1	2	2	2	2	2	2	2	2	2
20	4	4	5	4	4	3	3	1	1	2	2	2	1	2	2	2	2	2	2
21	4	4	4	4	4	4	3	2	1	1	2	2	1	2	2	2	2	2	2
22	2		3	2	3	3	5	1	1	1	2	2	2	2	2	2	2	2	2
23	5	4	5	4	3	4	3	1	1	2	2	2	2	2	2	2	2	2	2
24		5	5	5	5	5	3	1	1	1	2	2	2	2	2	2	2	2	2
25								1	1	2	2	2	2	2	2	2	2	2	2
26	1	1	1	1	4	4	4	2	1	1	2	1	2	2	2	2	2	2	2
27	5	5	5	5	5	5	2	2	1	1	2	2	1	2	2	2	2	2	2
28	4	4	4	4	4	4	4	2	1	1	2	2	2	2	2	2	2	2	2
29	4	4	4	4	3	4	1	1	1	2	2	2	2	2	2	2	2	2	2
30	5	5	4	5	3	4	3	2	2	1	2	2	2	2	1	2	2	2	2
31	1	5	1	5	5	5	5	2	1	1	2	2	2	2	2	2	2	2	2
32	5	5	5	5	5	5	5	1	1	2	1	2	1	2	1	2	2	2	2
33	4	4	4	4	3	4	2	1	1	1	2	2	2	2	2	2	2	2	2
34	5	5	5	5	5	5	3	2	2	1	2	2	1	2	2	2	2	2	2
35	3	3	3	3	3	3	3	1	1	1	2	2	2	2	2	2	2	2	2
36	5	5	5	5	5	5	2	1	1	1	2	2	2	2	2	2	2	2	2
37	3	4	4	5	5	3	2	2	1	1	2	2	1	2	2	2	2	2	2
38	4	5	4	5	5	5	5	1	1	1	2	2	2	2	2	2	2	2	2
39	1	1	1	1	1	1	5												
40	5	5	5	5	4	5	2	2	1	1	2	2	2	2	2	2	2	2	2
41								2	2	1	2	2	2	2	2	2	2	1	2
42	4	4	4	4	4	4	2	1	1	1	2	2	2	2	2	2	2	2	2
43	5	5	5	5	5	4	3	1	1	1	2	2	2	2	2	2	2	2	2
44	4	4	4	4	4	4	3	1	1	1	2	2	2	2	2	2	2	2	2
45	5	5	5	5	5	5	1	2	1	2	1	2	1	2	2	2	2	2	2
46	4	4	4	4	4	4	3	1	1	1	2	2	2	2	2	2	2	2	2
47	4	4	4	4	4	4	3	1	1	2	2	2	1	2	2	2	2	2	2
48	5	5	5	5	5	5	3	2	1	2	1	2	1	2	2	2	2	2	2
49	4	3	4	3	3	4	3	1	1	2	2	2	1	2	2	2	2	2	2
50	4	4	4	4	4	4	4	2	1	2	2	2	1	2	2	1	2	2	2
51	5	5	4	5	4	5	4	1	1	2	2	2	1	2	2	2	2	2	2
52	5	5	5	5	5	5	5	2	1	2	2	1	2	2	2	2	1	2	2
53	2	4	4	4	4	4	2	1	1	2	2	2	1	2	2	2	2	2	2
54	5	5	5	5	5	5	1	2	2	1	2	2	2	2	2	1	2	2	2
55	3	3	1	1	1	1	1	1	2	2	2	2	2	1	2	2	2	2	2
56	5	5	5	5	5	5	3	1	1	1	2	2	2	2	2	2	2	2	2
57	5	5	4	4	4	4	1	2	1	1	2	2	2	2	2	2	2	2	2
58	5	5	5	5	5	5	5	1	2	1	2	2	2	2	2	2	2	2	2
59	4	4	4	4	4	4	3	2	1	1	2	2	2	2	2	2	2	2	2
60	5	1	5	5	5	5	5	2	1	1	2	2	2	2	2	2	2	2	2
61	5	2	5	5	5	5	3	1	1	1	1	2	2	2	1	2	2	2	2
62	4	4	5	3	3	4	3	2	2	1	2	2	1	2	2	2	2	2	2
63	5	5	5	5	5	5	3	1	1	1	2	2	2	2	2	2	2	2	2
64	5	5	5	5	5	5	5	1	1	2	2	2	2	2	2	2	2	2	2
65	4	4	4	4	4	4	3	1	1	2	2	2	2	2	2	2	2	2	2
66	4	4	4	4	5	5	3	1	1	1	2	2	2	2	2	2	2	2	2
67	5	5	5	5	5	5	1	2	1	2	2	2	1	2	1	2	2	2	2
68	5	5	5	5	5	5	3	1	1	1	2	2	2	2	2	2	2	2	2
69	4	4	3	3	3	4	3	2	1	2	2	2	1	2	2	2	2	2	2
70	3	3	3	3	3	3	3	1	1	2	2	2	2	2	2	2	2	2	2
71	5	5	5	5	5	5	2	2	1	1	2	2	2	2	2	2	2	2	2
72	4	2	2	4	4	4	4	1	1	2	2	2	2	2	2	2	2	2	2
73								2	1	1	2	2	2	2	2	2	2	2	2
74	5	5	5	5	4	5	5	2	1	2	2	2	2	2	2	2	2	2	2
75	5	5	5	5	5	5	4	2	1	1	2	2	1	1	1	1	1	2	2
76		5		5		5													
77								2	1	2	2	1	2	2	2	2	2	2	2
78	5	5	5	5	3	4	4	1	1	2	2	2	2	2	2	2	2	2	2
79	4	4	4	4	4	4	2	1	1	2	2	2	2	2	2	2	2	2	2
80	5	5	5	5	5	4		2	1	2	2	2	1	2	2	2	2	2	2
81	5	5	5	5	5	4		2	1	2	2	2	1	2	2	2	2	2	2
82	5	5	5	5	5	4		2	1	2	2	2	1	2	2	2	2	2	2
83	5	5	5	5	5	4		2	1	2	2	2	1	2	2	2	2	2	2
84	4	4	4	4		0	1	1	1	2	2	2	2	1	2	2	2	2	2
85	4	4	4	4	4	4	1	2	1	2	2	2	1	2	2	2	2	2	2
86	4	4	4	4	4	4	2	2	2	1	2	2	1	2	2	2	2	2	2
87	5	5	5	5	5	5	3	1	1	2	2	2	1	2	2	2	2	2	2
88	5	5	5	5	5	5	2	1	1	2	2	2	1	2	2	2	2	2	2
89								2	1	1	2	2	2	2	2	2	2	2	2
90								2	1	2	2	2	2	2	2	2	2	2	2
91	3	4	4	4	4	4	2	2	2	1	2	2	2	2	2	2	2	2	2
92	5	5	5	5	4	5	1	2	1	2	2	2	1	1	2	2	2	2	2
93	5	5	5	5	5	5	5	1	2	1	2	2	1	2	2	2	2	2	2
94	5	5	5	5	5	5	3	1	1	1	2	2	2	2	2	2	2	2	2
95	5	5	5	5	5	5	5	2	1	2	1	2	1	2	2	2	2	2	2
96	5	5	5	5	5	5	5	1	1	1	2	2	2	2	2	2	2	2	2
97	5	5	5	5	5	5	1	1	1	1	2	2	2	2	2	2	2	2	2
98	3	4	4	4	3	4	3	1	1	1	2	2	2	2	2	2	2	2	2
99								1	1	1	2	2	2	2	2	2	2	2	2
100	5	5	5	5	3	5	5	1	1	1	2	2	2	2	2	2	2	2	2
101	5	3	4	4	3	5	2	2	1	1	2	2	2	2	2	2	2	2	2
102	4		4	4		4	3	1	1	1	2	2	2	2	2	2	2	2	2

Table G.1. Continues

NO	V29_11	V29_12	V29_13	V29_14	V29_15	V29_16	V29_17	V30_1	V30_2	V30_3	V30_4	V30_5	V30_6	V30_7	V30_8	V30_9	V30_10	V30_11	V30_12
103	5	5	5	5	5	5	5	1	1	1	1	2	1	1	2	1	2	2	2
104	5	5		5	4	4	1	2	2	1	1	2	1	2	2	2	2	2	2
105																			
106								1	1	1	2	2	2	2	2	2	2	2	2
107	5	5	5	5	5	5	5	2	2	1	2	2	2	2	2	1	2	2	2
108	1	0	5	5	5	1	5	2	1	2	2	2	2	2	2	2	2	2	2
109						0	0	2	1	2	2	2	2	2	2	2	2	2	2
110						0	0	2	2	1	2	2	1	2	2	2	2	2	2
111	5	3	4	3	3	5	5	1	2	1	1	2	2	2	2	2	2	2	2
112	5	5	5	5	5	5	3	1	1	1	1	2	2	2	2	2	2	2	2
113	4	4	4	4	4	4	4	2	1	2	2	2	2	1	2	2	2	2	2
114	5	5	5	5	5	5	1	2	2	1	2	2	2	2	2	2	1	2	2
115	4	4	4	4	4	4		2	2	1	1	2	1	2	2	2	2	2	2
116		4	5		5	3	3	2	1	1	2	1	2	2	2	2	2	2	2
117	4	2	4	4	4	4	2	2	1	2	2	1	1	2	2	2	2	2	2
118	4	4	4	4	4	4	2	1	1	1	2	2	2	2	2	2	2	2	2
119	0	4	4	0	4	4	4	1	1	1	2	2	2	2	2	2	2	2	2
120	4	4	4	4	4	4	1	2	2	1	2	2	2	2	1	2	2	2	2
121	5	5	5	5	5	5	3	2	1	1	2	2	2	2	2	2	2	2	2
122	5	5	5	5	5	5	1	2	1	1	1	2	2	2	2	2	2	2	2
123	5	5	4	4	2	2	5	1	1	1	2	2	2	2	2	2	2	2	2
124	5	5	5	5	5	5	3	1	2	1	2	2	2	2	2	2	2	2	2
125	4	4	5	5	5	5		2	1	2	2	2	2	2	2	2	2	2	2
126								1	1	1	2	2	2	2	2	2	2	2	2
127	4	3	5	5	5	4	3	1	1	1	2	2	2	2	2	2	2	2	2
128	3	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2
129	3	4	4	5	4	4	5	1	2	1	2	2	2	2	2	2	2	2	2
130	5	5	5	5	5	5	5	2	1	1	2	2	2	2	2	2	2	2	2
131	5	5	5	5	5	5	3	2	1	1	2	2	2	2	2	2	2	2	2
132	5	5	5	5	5	1	1	2	1	2	2	2	1	2	2	2	2	2	2
133	5	5	3	5	5	5	2	2	2	1	2	2	1	2	2	2	2	2	2
134	5	5	5	5	5	5	3	1	1	2	1	2	2	2	1	2	1	1	2
135	5	5	5	4	4			1	2	1	2	2	2	2	2	2	2	2	2
136			5	5	5		1	2	1	2	2	2	1	2	2	2	2	2	2
137	4		4	4	4	4	0	2	2	1	2	1	1	2	2	2	2	2	2
138	4	4	4	4	4	4	2	2	1	1	2	2	2	2	2	2	2	2	2
139	5	5	5	5	5	5	5	1	1	1	2	2	2	2	2	2	2	2	2
140	4	2	4	4	4	4	1	2	1	2	2	2	2	2	2	2	2	2	2
141	5	5	5	5	3	4	3												
142	5	5	5	5	2	4	2	1	2	1	2	2	1	2	2	2	2	2	2
143	4	4	4	4	4	4	1	1	2	1	2	1	2	2	2	2	2	2	2
144	5	5	4	4	4	4	1	1	1	2	2	2	2	2	2	2	2	2	2
145	3	2	3	3	3	3	2	2	1	1	2	2	2	2	2	2	2	2	2
146	5	5	5	4	5	5	3	1	1	1	2	2	2	2	2	2	2	2	2
147																			
148																			
149																			
150																			
151																			
152																			
153																			
154																			
155																			
156																			
157	4							2	1	2	2	2	1	2	2	2	2	2	2
158																			
159																			
160	5	4	4	4	4	1	1	2	1	1	2	2	1	2	2	2	2	2	2
161								1	2	2	2	2	2	2	2	2	1	2	2
162																			
163	4	4	4	4	3	4	2	2	1	2	2	2	2	2	2	2	2	2	2
164	5	5						2	2	1	2	2	1	2	2	2	1	1	2
165	4	4	4	4	4	4	3	1	1	1	2	2	2	2	2	2	2	2	2
166	5	3	1	2	3	5	5	2	1	1	2	2	2	2	2	2	2	2	2
167	3	3	4	3	2	2	4	1	1	2	2	2	2	2	2	2	2	2	2
168																			
169																			
170																			
171																			
172																			
173	5	5	5	5	5	5	3												
174	5	5	5	5	5	5	3	1	1	1	2	2	2	2	1	2	2	2	2
175	5	5	5	5	3	5	1	2	2	1	2	2	1	2	2	2	2	2	2
176																			
177	4	4	5	5	3	5	2	2	2	1	2	2	2	2	1	2	2	2	2
178	5	4	5	5	5	5	5	2	1	2	2	2	1	2	2	2	2	2	2
179	5	5	5	5	5	5	3	1	1	1	2	2	2	2	2	2	2	2	2
180	5	5	5	5	5	5	1	2	1	1	2	2	2	2	2	2	2	2	2
181	4	4	4	4	4	4	2	2	1	2	2	2	2	2	1	2	2	1	2
182	5	4	5	5	4	4	3	1	2	2	2	2	1	2	1	2	2	2	2
183	4	5	4	4	4	4	1	1	2	1	2	2	2	2	2	2	2	2	2
184	5	5	5	5	5	5	1												
185	5	3	5	5	5	5	3												
186	5	5	5	5	5	5	3	1	1	1	2	2	2	2	2	2	2	2	2
187	4	4	4	4	4	4	4	1	1	1	2	2	2	2	2	2	2	2	2
188																			
189																			
190	5	5	4	5	5	5	4	1	1	1	2	2	2	2	2	2	2	2	2
191	4	4	4	4	4	4	3	1	1	2	2	2	2	2	2	2	2	2	2
192	5	5	5	5	3	5	5	1	1	2	2	2	1	2	2	2	2	2	2
193																			
194	4	2	3	4	4	3	3	2	2	1	2	2	2	2	2	2	2	2	2
195								1	2	1	2	2	2	2	2	2	2	2	2
196								1	2	1	2	2	2	2	2	1	2	2	2
197								2	2	1	2	2	2	2	2	2	2	2	2
198																			
199	4	4	4	4	4	4	2	2	2	1	2	1	2	2	2	2	2	2	2
200	4	4	4	4	4	4	4	1	2	1	2	2	2	2	2	2	2	2	2
201	4	4	4	4	4	4	4	2	1	2	2	2	2	2	2	2	2	2	2
202	5	5	5	5	5	5	3	1	1	1	1	2	1	2	2	2	2	2	2
203	5	3	5	5	5	5	3	2	1	1	2	2	2	2	2	2	2	2	2
204	4	4	4	4	4	4	4	2	2	1	2	2	2	2	2	1	2	2	2
205	4	4	4	4	4	4	2	1	1	1	2	2	2	2	2	2	2	2	2
206	4	4	5	5	5	4	3												
207	5	5	5	5	5	5	1	2	1	1	1	2	1	2	1	2	2	2	2

Table G.1. Continues

NO	V30_13	V30_14	V30_15	V31_1	V31_2	V31_3	V31_4	V31_5	V31_6	V31_7	V31_8	V31_9	V31_10	V31_11	V31_12	V31_13	V31_14	V31_15	V32_1
1	2	1	1	3	3	3	3	3	3	3		3	3	3	3	3	3	3	
2																			
3	2	2	1	3	3	3	3	3	1	1	1	3	3	3	3	3	3	3	4
4	1	2	1	3		3	3	3				3	3	3		3	3	3	3
5																			
6	2	1	2	3	3	3	3	3	3	3	1	1	1	1	1	3		3	
7	1	2	1		5		5	5	5					5					3
8	2	2	1	4	3	3	3	3	3	3	2	2	3	4	3	3	3	3	3
9	1	2	1	5	3	5	3	3	3	3	3	2	4	3	3	3	3	3	
10				3	3	3	3	3	3	3	3	1	1	1	3	3	3	3	
11	2	2	2	3	3	3	3	3	3	3	3	2	3	3	3	2	3	3	3
12	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
13	2	2	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3
14	2	2	2	3	3	3	3	3	3	3	3	1	3	3	3	1	2	3	2
15	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
16	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
17	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18	1	2	1	3	3	3	3	3	3	3	2	2	2	3	3	2	3	2	3
19	2	2	1	1	1	1	3	3	1	1	1	1	3	1	3	1	1	1	3
20	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21	2	2	2																
22	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
23	2	1	2	3	2	3	4	5	2	1	2	1	3	4	3	4	2	3	3
24	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
25	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
26	2	2	2	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3
27	2	2	2	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
28	2	2	1	3	3	3	3	3	2	3	2	2	3	3	3	2	3	3	3
29	2	2	1	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3
30	2	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
31	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	3
32	1	1	1	3	3		3	3	3					3	3	3			3
33	2	2	1	3	3	3	3	3	3	2	3	2	2	2	3	3	3	3	3
34	2	1	2	3	3	3	3												
35	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
36	2	2	2	3	3	3	3	3	3		3	2	3	3	3	2	3	2	2
37	2	2	1	4	3	4	3	3	4	3	2		4	4	3	3	2	2	2
38	2	2	2	3	3	3	3	3	3	1	3	1	3	3	3	3	3	2	4
39																			
40	2	2	1	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	5
41	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
42	2	2	2	4	4		4	1	4	3	2	2	2	4	4	4	4	4	
43	2	2	2	3	3	3	3	3	3										4
44	2	2	2	3	3	3	3	3	3	2	3	2	3	3	3	3	3	3	3
45	2	2	2	3	3	3	3	3	3	1	5	1	5	5	5	5	5	1	4
46	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
47	2	2	2	3	3	3	3	3	3										3
48	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
49	2	2	2	3	3	3	3	3	3	2	2	2	3	3	3	3	3	2	3
50	2	1	2	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3
51	2	2	2	4	4	4	4	3	3	1	1	1	1	3	3	3	3	2	3
52	2	1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
53	2	2	2	4	4	4	4	4	4	2	4	2	4	4	4	4	4	4	5
54	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5
55	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	4
56	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
57	2	1	2	3	5	3	3	3	3	3	1	3	3	3	3	3	1	3	4
58	1	2	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3
59	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
60	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
61	2	2	2	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3
62	2	2	1	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3
63	2	2	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	5
64	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
65	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
66	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
67	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
68	2	2	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	5
69	2	2	1	3	3	3	3	3	3	2	2	2	2	3	3	2	2	2	2
70	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
71	2	1	1	3	3	3	3	3	3	3	3		3		3		3		4
72	2	2	1	3	3	3	3	3	3	2	3	2	2	3	3	3	2	2	3
73	1	2	2																
74	2	2	2	3	3	3	3	3	3	3	2	5		3	3	3	3	3	4
75	1	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
76				3	3	3	3	3	3	3	3			3	3	0	3	3	3
77	2	1	2	1					1										3
78	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5
79	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1
80	2	2	1	5	5	2	5	4	3	3	3	3	3	3	3	3	3	3	3
81	2	2	1	5	5	2	5	4	3	3	3	3	3	3	3	3	3	3	3
82	2	2	1	5	5	2	5	4	3	3	3	3	3	3	3	3	3	3	3
83	2	2	1	5	5	2	5	4	3	3	3	3	3	3	3	3	3	3	3
84	2	2	2																
85	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
86	2	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
87	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
88	2	2	2	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3
89	1	2	2	3	3		3	3	3				3		3			3	
90	2	1	1																5
91	2	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
92	2	2	2	3	3	2	3	3	3	1	3	2	3	3	3	3	3	3	4
93	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
94	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
95	2	2	2		4		4		4					4	4		4		3
96	2	2	2	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	5
97	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5
98	2	2	2	3	3	3	3	3	2	3	3	3	3	3	3	2	2	3	3
99	2	2	2	3	3	1	3	3	3		2	2	2	2	3	1	1	1	3
100	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
101	2	1	2	3	4	3	3	4	2	3	2	1	3	4	3	2	3	2	3
102	2	2	2	3	3		3	4	4		4	1		3			2	2	4

Table G.1. Continues

NO	V30_13	V30_14	V30_15	V31_1	V31_2	V31_3	V31_4	V31_5	V31_6	V31_7	V31_8	V31_9	V31_10	V31_11	V31_12	V31_13	V31_14	V31_15	V32_1
103	1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
104	2	2	2	5	5	4	4	4	4	4	4	4	4	4	0	4	4	4	
105																			
106	2	2	2	3	3	3	3	3	3	3	3	1	2	3	3	3	2	1	3
107	1	2	2	3	3	3	3	3	3	3	1	1	3	3	3	3	3	3	5
108	1	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
109	2	2	1																
110	2	2	1	3	3	3	4	4	3	3	3	3	4	3	3	4	3	3	3
111	1	1	1	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
112	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
113	2	1	2	3	3	3	3	3	3	3	3	1	3	3	3	3	3		3
114	2	2	1	3	3	3	3	3	3	2	2	3			3	3	3	2	
115	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
116	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
117	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
118	2	2	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	5
119	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
120	2	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
121	2	2	1	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	5
122	2	2	1	4	4	4	4	4	4		2	2	4	4	4	2	2	4	1
123	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
124	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
125	2	2	1	3	3	3	3	3	3		3	3	3	3		3	3	3	5
126	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
127	2	2	2	3	3	3	3	3	3	2	3	2	3	3	3	2	3	2	
128	2	2	1	3	3	3	3	3	3	1	1	1	1	4	4	1	1	1	4
129	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
130	2	1	2	3	3	3	3	4	3	3	3	3	3	3	3	3	3	3	4
131	2	1	2	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
132	2	1	2	3	3	3	3	3	1	3	2	1	3	2	3	3	3	3	5
133	2	2	1	3	3	3	3	3	3					3	3				3
134	1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
135	2	1	2																
136	2	1	2	3	3	3	3	3	2	3	3	2	3	3	3			3	5
137	2	2	2																
138	2	1	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
139	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
140	2	1	1	3	3	3	3	4	3	2	2	2	3	3	3	4	3	3	3
141				3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5
142	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5
143	2	2	2	4	4	4	3	3	2	3	3	2	3	3	3	3	3	2	5
144	2	1	2	3	3	4	3	3	3	3	3	4	4	4	4	4	4	3	4
145	2	1	2	3	4	3	5	4	2	2	1	3	3	3	3	3	2	3	4
146	2	2	2																
147																			
148																			
149																			
150																			
151																			
152																			
153																			
154																			
155																			5
156																			
157	2	2	2	3	3	3	3	3	3	2	3		3	3	3	2	3	3	3
158																			
159																			
160	2	2	2	3	3	3	3	4	4	3	3	3	3	3	3	3	3	3	4
161	2	1	2																
162																			
163	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
164	1	1	2																
165	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
166	2	1	2	1	3	3	5	5	5	5	1	1	1	2	5	1	5	1	1
167	2	2	1	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
168																			
169																			
170																			
171																			
172																			
173				3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
174	2	2	2	3	3	3	3	3	3		2	3	3	1	3	2	2	1	5
175	2	2	1	3	3		3	3	3	3	2	2		3	3	3			4
176																			
177	2	1	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	
178	2	2	1	3	3	3	3	3	3	3	3	2	3	3	3	3	3		3
179	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
180	2	1	2	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	4
181	2	2	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3
182	2	2	2	4	4		4	4	4					4	4	4			
183	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
184				3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
185				3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
186	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3		5
187	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
188																			
189																			
190	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
191	2	1	2	4	4	3	3	3	3	3	2	2	3	2	3	2	3	3	3
192	2	2	2	3	3	3	3	3	2	1	2	2	3	3	3	3	3	3	4
193																			
194	2	1	1	3	3	3	3	3	3	2	3	2	3	3	3	4	3	3	3
195	2	2	1																
196	2	2	2				3												
197	2	2	2																
198																			
199	2	2	1	4	3	3	3	3	3	2	2	3	3	4	3	3	3	3	3
200	1	2	2	3	3	4	3	3	3	2	2	2	2	2	3	2	3	2	4
201	2	1	1	3	3	3	3	3			3			3	3	3	3	3	4
202	2	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
203	2	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
204	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
205	2	2	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3
206				3	4	1	3	3	3	3	3	3	3	3	3	3	3	3	3
207	1	2	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	4

Table G.1. Continues

NO	V32_2	V32_3	V32_4	V32_5	V32_6	V32_7	V32_8	V32_9	V32_10	V32_11	V32_12	V32_13	V32_14	V32_15	V33	V33_1	V33_2	V33_3	V33_4	V33_5
1																				
2															1	1	2	2	2	2
3	3	4	4	3	3	1	1	1	3	3	3	3	3	3	1	1	2	2	2	2
4	3	0	4	4	2				3	3	5	5	0	4	1	1	2	2	2	2
5																				
6	2	2	2	2	2						2				1	2	2	2	2	1
7	3		3	3	3						3				1	2	2	2	2	1
8	3	5	5	5	5	0	3	4	5	5	5	4	5	4	1	2	2	2	2	1
9																				
10															1	1	2	2	2	1
11	3	4	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2
12	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
13	3	4	3	3	3	3	3	3	3	3	3	3	3	3	1	2	2	2	2	1
14	3	4	4	3	3	4	3	1	2	3	4		5	5	2	1	2	2	2	1
15	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
16	3	5	5	3	3	3	3	3	3	3	4	3	5	3	2	1	2	2	2	1
17	2	3	3	2	2	1	2	1	2	2	2	1	2	1	2	1	2	2	2	1
18	2	2	2	2	2	2	2	1	1	2	3	1	3	3	2	1	2	2	2	1
19	2	3	4	3	3	2	2								2	1	2	2	2	1
20	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	2	2	2	2	1
21															2	2	1	2	2	1
22	4	4	4	4	0	4	4	4	4	4	4	4	4	4	2	1	2	2	2	1
23	4	3	2	3	4	1	2	3	4	5	4	3	5	4	2	1	2	2	2	1
24	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
25															1	2	2	2	2	1
26	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3	1	2	2	1	1
27	3	4	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
28	3	3	3	3	3	3	3	1	3	3	3	3	3	3	2	1	2	2	2	1
29	3	3	3	3	3	2	2	3	3	3	3	3	3	3	1	1	2	2	2	2
30	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
31	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
32	3			3	3					3	3	3			2	1	2	2	2	1
33	3	4	4		3	2	2	4	3	3	4	3	4	4	2	1	2	2	2	1
34															1	2	2	2	2	1
35	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	1	2	2	2	1
36	3	3	3	3	2	1	3	1	3	2	3	2	3	2	3	1	2	1	1	1
37	3	3	4	3	3	1	2	1	3	3	3	1	2	1	3	1	2	1	2	1
38	3	5	3	3	2	1	2	1	2	1	2	2	3	1	2	2	2	2	1	1
39																				
40	5	5	5	4	4	3	4	4	4	4	4	3	5	4	2	1	2	2	2	1
41			5								5				2	1	2	2	2	1
42															2	1	2	2	2	1
43	3	5	5	4	4										2	1	2	2	2	1
44	3	3	3	3	3		3	3	3	3	3	3	3	3	3	1	2	1	2	1
45	4	5	4	4	4	1	3	4	4	4	3	3	3	3	2	1	2	2	2	1
46	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
47	3	3	3	3	3					3	3				3	1	1	1	2	2
48	3	3	3	3	3	3	3	3	3	3	3	4	3	3	1	2	2	2	2	1
49	3		3	3	3					3	3	3	3	0	2	1	2	2	2	1
50	3	3	3	3	3	3	3	1	3	3	3	3	3	3	2	1	2	2	2	1
51	3	3	3	3	3	3	2	2	2	2	2	2	1	1	2	1	2	2	2	1
52	3	4	5	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
53	5	5	3	3	3	3	3		3	3	3	3	3	3	1	1	2	2	2	2
54	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1	2	2	2	2	1
55	4	5	5	4	4	2	3	5	5	3	5	3	1	3	2	1	2	2	2	1
56	3	3	5	5	5	3	3	3	3	3	3	3	3	3	2	2	2	1	2	1
57	4	4	5	4	4	4	4	4	4	4	4	4	4	4	2	1	2	2	2	1
58	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
59	3	4	4	3	3	4	3	4	4	3	4	4	4	3	2	2	2	1	2	1
60	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
61	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
62	3	3	4	3	3	1	3	4	4	4	4	3	4	4	2	2	2	1	2	1
63	3	5	5	3	3	3	3	3	3	3	3	5	0	3	2	1	2	2	2	1
64															2	1	1	2	2	2
65	4	5	4	4	3	3	3	5	3	2	4	3	4	4	2	2	2	2	1	1
66	3	4	3	3		2	3	3	3	3	3	3	3	3	2	1	2	2	2	1
67	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	2	2	2	1
68	3	5	5	3	5	3	3	3	5	5	5	5	5	5	2	1	2	2	2	1
69	4	3	3	3		1	1	1	1	3	3	1	1	1	1	2	2	2	2	1
70	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	2	2	2	2
71	2	4	4	4	3		3	5	3	2	0	2	5	4	2	1	2	2	2	1
72	3	3	3	3	1	1		1	1	2	3	1	1	1	2	1	2	2	2	1
73															2	1	2	2	2	1
74	3	3	3	3	3	3	3	3	3	3	3	0	3	3	3	2	3	3	3	2
75	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	2	2	1	2
76	3	3	3	3	3					3	4	3	4	4	3	1	2	2	1	1
77															2	1	2	2	2	1
78	3	5	4	5	4	3	4	5	5	5	5	4	5	5	3	1	2	1	2	1
79	3	4	3	3	3	2	2	2	3	3	3	3	2	2	2	1	2	2	2	1
80	2	4	1	1	4	1	1	1	1	1	1	1	1	1	2	1	2	2	2	1
81	2	4	1	1	4	1	1	1	1	1	1	1	1	1	2	1	2	2	2	1
82	2	4	1	1	4	1	1	1	1	1	1	1	1	1	2	1	2	2	2	1
83	2	4	1	1	4	1	1	1	1	1	1	1	1	1	2	1	2	2	2	1
84															3	1	2	2	1	2
85	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	2	2	2	2	1
86	3	4	5	4	3	3	3	4	4	3	4	3	4	4	2	2	2	2	1	1
87	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	1	1	2	2
88	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
89															1	2	2	2	2	1
90	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1	1	2	2	2	2
91	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
92	3	4	3	3	2	2	4	5	4	4	5	4	5	4	2	1	2	2	2	1
93	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
94	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
95	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	2	2	2	2	1
96	5	5	5	5	5	1	1	1	5	5	5	2	5	2	2	1	2	2	2	1
97	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	1	2	1	2	1
98	1	2	3	2	1	1	1	3	3	3	3	2	1	3	1	2	2	2	2	1
99	3	1	3	3	3	2	2	2	2	2	3	1	3	1	2	1	2	2	2	1
100															2	1	2	2	2	1
101	3	3	4	2	0	0	2	1		1	2	3	4	5	2	1	2	2	2	1
102	3	5	3	2	2	4	4	5		3	5	4	4	4	3	1	1	2	2	1

Table G.1. Continues

NO	V32_2	V32_3	V32_4	V32_5	V32_6	V32_7	V32_8	V32_9	V32_10	V32_11	V32_12	V32_13	V32_14	V32_15	V33	V33_1	V33_2	V33_3	V33_4	V33_5
103	1	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
104																				
105																				
106	3	3	3	3	3	3	3	1	1	2	3	3	2	1	3	1	2	2	1	1
107	5	5	5	5	5	5	3	3	3	3	3	3	3	3	1	2	2	2	2	1
108	5	4	4							4	5	4	5	3	2	1	2	2	2	1
109					3															
110	3	3	4	4	3	3	3	3	4	3	3	4	3	3	2	1	2	2	2	1
111	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
112	3	2	2	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
113	3	4	4	3	3	2	2	1	3	3	3	3	3	3	2	1	2	2	2	1
114	2	5	5	3	3	1	1	5	2		5	2	5	1	2	1	1	2	2	2
115	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
116	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
117	4	3	5	4	4	5	3	4	4	4	4	2	5	4	2	1	2	2	2	1
118	4	5	5	4	4	3	4	4	4	4	5	5	5	5	1	2	2	2	2	1
119	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	2	2	2	2	1
120	3	4	5	3	4	3	3	5	3	3	4	4	5	3	2	1	2	2	2	1
121	5	5	5	5	5	5		5	5	5	5	5	5	5	2	1	2	2	2	1
122	3	5	5	5	5	5	1	1	5	2	5	1	5	5	3	1	2	1	2	1
123	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
124	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	2	1	2	1
125	5	5	5	5	5		5	5	5	5	5	5	5	5	2	1	1	2	2	2
126															1	2	2	2	2	1
127	3	3	3	3	3	2	3	3	3	3	3	3	3	3	2	1	2	2	2	1
128	2	5	5	4	4	4	2	3	3	2	5	2	2	2	1	2	2	2	2	1
129	3	4	5	2	2	3	2	1	3	3	4	3	4	3	2	1	2	2	2	1
130	3	5	5	3	3	3	3	3	4	4	4	3	4	5	1	2	2	2	2	1
131	3	4	4	3	3	3	2	3	3	4	4	3	3	3	2	2	2	1	2	1
132	5	5	5	5	5	5	1	5	4	4	5	1	5	4	2	1	2	2	2	1
133	2	3	4	3								3			1	2	2	2	2	1
134	4	4	5	4	4	4	4	4	4	4	5	5	5	5	2	1	2	2	2	1
135															1	2	2	2	2	1
136	5	5	5	5	1	3	3	5	5	3	5	5	5	5	2	1	2	2	2	1
137															3	1	2	1	2	1
138													3	3	2	1	2	2	2	1
139	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
140	4	3	4	4	4	1	1	4	2	3	3	2	5	3	2	1	2	2	2	1
141	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2	1	2	2	2	1
142	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2	1	2	2	2	1
143	4	5	5	5	4	4	0	5	5	4	4	4	4	4	2	1	2	2	2	1
144	3	5	5	3	3	2	2	3	3	2	4	4	4	4	2	1	2	2	2	1
145	3	4	5	4	4	5	3	5	5	4	5	4	5	5	2	1	2	2	2	1
146															1	1	2	2	2	2
147																				
148																				
149																				
150																				
151																				
152																				
153																				
154																				
155	3	3	3	5		1	3								3	1	2	1	2	1
156																				
157	3	4	3	3			3			3		2	5	2						
158																				
159																				
160	4	4	4	4	4	4	3	4	3	3	4	4	4	4	3	1	2	2	1	1
161																				
162																				
163	2	4	4	4	4	4	4	4	4	4	4	4	4	4	2	1	2	2	2	1
164																				
165	3	4	4	4	4	4	3	4	4	4	4	4	4	4	2	1	2	2	2	1
166	3	3	3	4	3	1	1	1	1	1	5	1	5	1	2	1	2	2	2	1
167	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	2	2	2	2
168																				
169																				
170																				
171																				
172																				
173	3	3	3	1	1	3	2	1	2	2	3	2	2	2	1	1	2	2	2	2
174	4	5	5	3	2	4	2	5	3	3	5	5	5	3	1	2	2	2	2	1
175	3	5	5	3	3	4	2	2	3						1	1	2	2	2	2
176																				
177	2		4	3	3	4	4	3	4	3	5	4	5	4						
178	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	1	2
179															1	1	2	2	2	2
180	4	4	4	4	4	4	3	3	3	4	3	4	4	3	2	1	2	2	1	2
181	3	3	3	3	3	3	3	4	3	3	4	3	4	3	3	1	2	2	1	1
182	5	0	5	5	5					5	5	5	5	0	2	1	2	1	2	2
183	3	5	5	3	3	3	3	3	5	3	5	3	3	3	1	1	2	2	2	2
184															1	1	2	2	2	2
185	3	5	4	3	3	3	3	3	3	3	4	3	2	2	1	2	2	2	2	1
186	4	5	5	5	5	4	4	5	4	5	4	5	5	4	2	2	1	2	2	1
187	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	1
188																				
189																				
190	4	4	3	4	3	3	4	4	4	4	3	4	4	0	2	1	2	2	2	1
191	2	4	3	2	2	3	1	5	5	3	4	3	5	5	2	1	2	2	2	1
192	3	5	3		2	2	2	5	3	3	3	4	4	3	2	1	2	2	2	1
193																				
194	3	3	3	3	3	2	3	4	3	3	3	3	4	4	2	1	2	2	2	1
195																				
196			3												2	1	2	2	2	1
197															4	1	1	1	2	1
198																				
199	3	3	3	3	3	2	2	3	3	2	3	3	3	3	2	1	2	2	2	1
200	2	3	4	2	2	1	1	1	1	1	3	1	4	1	2	1	2	2	2	1
201	2	3	4	2	2	1	1	1	1	1	3	1	4	1	2	1	2	2	2	1
202	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	2	2	2	2	1
203	3	5	5	3	3	2	2	5	5	3	3	5	5	5	2	2	2	1	2	1
204	3	5	5	3	3	3	3	5	5	5	5	5	5	5	2	1	2	2	2	1
205	3	5	4	3	3	3	3	5	3	3	3	3	3	3	3	1	2	2	1	1
206	3	3	5	3	3	3	3	5	4	3	5	5	5	3	1	2	2	2	2	1
207	3	4	4	3	3	3	3	3	3	3	5	3	5	3	2	1	2	2	2	1

Table G.1. Continues

NO	V34	V35	V36_1	V36_2	V36_3	V36_4	V36_5	V36_6	V36_7	V36_8	V36_9	V36_10	V36_11	V36_12	V36_13	V36_14	V36_15	V37_1	V37_2	V37_3
1																				
2		6	5															5		
3	1	6	5	5	5	5	4	4	4	4	4	4	2	3	3	3	2	4	3	1
4	1	5	4	4	5	4	4	3	4	3	4	2	4	5	2	4	2	4	4	5
5																				
6	1	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2	2	5
7	1	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5		2	5	5
8		5	4	4	5	4	4	2	4	2	5	5	5	5	5	5	1	5	5	5
9	1	6	5	4	4	1	4	1	2	2	4	2	3	4	2		2	3	4	5
10		6	5	5	4	3	5	3	1	4	5	4	4	5	1	4	2			
11	1	6	5	4	5	4	4	2	2	4	4	4	4	3	4	4	3	3	3	4
12	1	6	5	5	5	5	2	5	5	5	5	1	5	5	1	5	1	5	5	5
13		5	5	5	5	2	5	2	5	2	5	2	5	5	2	4	2	5	5	5
14	1		5	1	4	4	4	5	4	2	4	3	4	4	4	4	2	3	4	3
15	1	5	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3
16	1	6	4	4	5	2	5	2	2	4	4	2	4	5	2	3	2	4	5	5
17	1	6	5	5	5	4	5	2	4	1	2	4	2	4	4	2	2	4	4	5
18	1	6	4	3	2	3	4	4	2	2	4	2	4	2	4		2	3	3	4
19	1	6	4	4	4	2	4	2	4	4	4	5	4	4	5	5	2	3	3	5
20		6	4	4	5	4	5	2	4	3	4	2	4	4	2	4	3	3	4	4
21	1	6	4	4	4	4	4	3	1	4	5	3	2	3	4	4	2	4	4	4
22	1	6	5	5	5	4	4	2	2	2	4	4	4	4	4	4	2	5	5	5
23	1	6	5	4	5	4	3	1	5	4	3	4	5	4	3	2	1	1	2	3
24	1	5	2	2	2	2	5	2	2	2	2	5	5	5	2	2	5	2	2	5
25		6																4	5	5
26	1	6																		
27	1	6	5	4	5	5	5	5	5	2	4	2	3	4	2		2	4	4	4
28	1	5	4	3	4	2	4	2	2	2	4	2	3	4	3	4	2	3	4	4
29	1	5	5	5	5	1	5	4	2	4	5	3	4	5	5	5	2	3	3	4
30	1		5	5	4	1	5	2	5	4	4	5	4	4	5	3	2	3	3	5
31	2	6	5	5	5	5	5	1	5	1	5	1	4	4	4	4	1	5	5	5
32	1	6	5	5	5	5	5	2	5	5	4	4	5			4	5	3	3	5
33	1	6	5	4	4	4	4	2	2	4	5	3	3	4	4	4	2	3	3	4
34		6	5	2	2	4	5	2			4	5	5	5	5	5	2	4	4	4
35	1	6	5	3	3	3	3	5	2	2	4	4	3	4	2	4	3	3	3	4
36	1	6	5	5	5	5	5	2	3	5	3	2	5	3	1	2	1	5	5	5
37	1		4	4	1	1	3	5	1	4	5	2	2	5	5	5	2	3	4	4
38		6	4	5	5	4	4	1	4	2	4	2	4	4	1	4	1	4	4	5
39																				
40	1	6	2	5	5	5	5	2	5	2	5	2	5	5	4	5	1	3	3	5
41		6	4	4	5	4	4	4										3	3	3
42	1	6																5	5	4
43	1	5	5	4	4	4	4	2	4	4	4	4	4	4	2	3	1	4	4	4
44	1		3	4	5	4	5	2	4	3	4	4	4	4	2	3	2	3	3	4
45	1	6	5	5	5	2	5	2	5	1	4	4	4	4	1	2	4	1	1	2
46	1	5	4	4	4	2	4	3	4	2	4	4	3	4	4	3	2	4	4	4
47	1		5	5	5	5	5	3	2	3	4	3	4	4	4	4	3	3	4	4
48		6	3	4	4	4	4	2	2	4	2	4	4	4	2	4	2	3	3	4
49	1	6	3	4	4	2	3	3	2	2	3	3	3	4	4		2	4	5	4
50	1	6	4														3	3	3	4
51	1	6	4	4	4	4	3	4	4		4		3	4	3		3	4	4	4
52	1		5	5	5	5	5	5	1	5	5	5	5	5	5	5	5	4	4	5
53	1	6	4	4	4	4	4	4	2	3	4	2	4	4	2	4	3	3	3	4
54	0	6	5	5	5	5	5	3	2	4	3	5	1	3	4	1	5	3	3	3
55	1	6	5	4	3	2	4	2	5	2	4	4	4	2	3	1	3	1	3	4
56	0	4	5	5	5	1	5	1	1	5	5	4	5	5	1	5	4	3	4	5
57	1	5	1	2	1	2	1	5	1	4	5	5	5	5	2	2	2	5	5	5
58	1	6	5	5	5	5	4	4	3	5	5	5	3	4	5	5	4	4	4	5
59		6	4	4	4	3	4	3	4	3	5	4	5	4	4	4	2	4	5	5
60	3	6	5	5	5	5	5	1	5	1	5	1	5	5	5	5	1	5	5	5
61	1	6	4	5	5	4	5	2	2		5	5	5	5	5	5		5	5	5
62		5	4	4	5	3	5	2		4	5	4	2	4	4	4	2	5	5	5
63	1	6	5	5	5	4	4	4	5	5	5	4	4	5	5	5	2	5	5	5
64		6	1	5	5	5	5	5		2	4	5	1	1	4	4	5	1	1	5
65		6	5	4	4	1	4	2	2	1	3	1	5	4	2	2	2	4	4	4
66	1	6	4	4	4	4	4	2	4	2	4	3	4	4	4	4	3	4	4	4
67		6	5	5	5	5	5	2	4	1	5	1	2	5	1	4	1	3	3	4
68	1		2	5	5	2	5	2	5	2	5	5	5	5	5	5	2	3	5	5
69		5	5	4	3	2	5	5	2	0	4	4	4	4	4	4	3	3	3	4
70	1	6	4	4	4	2	4	2	3	2	4	4	4	4	4	4	2	5	5	5
71	1	6	5	5	5	5	5	1	4	4	5	5	5	5	2	5	1	4	4	4
72	2	6	5	5	5	5	5	4	3	4	2	4	5	4	4	4	3	4	3	4
73	2	6																		
74	1		5	4	5	5	4	4	2	2	3	4	3	4	2		2	4	3	4
75		6	4	4	4	2	4	2	2	4	4	3	4	2	2	3	2	4	4	4
76	1	5			5		5		5											5
77	1	6	5		5															
78	1	6	4	5	5	4	5	5	4	4	3	4	4	5	1	5	2	5	5	5
79	1	6	4	4	4	2	4	3	4	3	4	3	4	3	4	4	2	3	3	4
80	1	6	5	5	5	5	5	2	2	5	4	4	5	3	2	2	1	1	3	5
81	1	6	5	5	5	5	5	2	2	5	4	4	5	3	2	2	1	1	3	5
82	1	6	5	5	5	5	5	2	2	5	4	4	5	3	2	2	1	1	3	5
83	1	6	5	5	5	5	5	2	2	5	4	4	5	3	2	2	1	1	3	5
84	1	6	5	4	4	2	4													
85	0	6	4	3	4	3	4	4	2	3	3	3	3	3	3	3	3	3	3	4
86	0	6	5	4	4	4	4	2	4	4	5	2	4	5	2	4	2	4	4	4
87		6	5	5	5	5	5	5	2	3	4	4	4	4	4	4	3	5	5	5
88	1	5	5	4	5	4	5	4	4	2	5	4	5	4	5	4	1	3	4	4
89		5			5															
90	1	6	5	5	5	5	5	5		5	5	5	5	5	5	5	5			
91	1	5	5	5	5	5	4	5	1	2	5	3	4	5	1	3	1	3	3	5
92	1	5	4	5	5	4	5	4	4	4	2	4	4	4	2	4	4	2	2	2
93	1	1	5	2	5	5	3	1	3	4	4	4	4	4	4	4	1	5	5	5
94	1	6	5	5	5	5	5	5	1	1	5	5	4	5	5	5	2	3	5	5
95		6	5	5	5	5	5	1	1	5	5	5	5	5	1	5	1	3	3	5
96	1	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1	5	5	5
97	1	6	5	5	5	5	5	5	5	3	5	1	5	5	1	5	1	5	5	5
98		6	5	4	4	2	4	2	4	2	2	2		3	4	3	2	4	4	4
99	1																	4	4	4
100	1	6																		
101	1	5	3	4	3	5	4	3	3	3	3	4	5	4	5	3	5	3	4	5
102	1	6	5	3	4	4	4	3	4	2	5	0	0	4	4	4	5	4	4	4

Table G.1. Continues

NO	V34	V35	V36_1	V36_2	V36_3	V36_4	V36_5	V36_6	V36_7	V36_8	V36_9	V36_10	V36_11	V36_12	V36_13	V36_14	V36_15	V37_1	V37_2	V37_3
103	1	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5	5	5
104		1	5	0	5	5	5	5	1	5	1	4	4	5	5	5	2	1	5	5
105																				
106	1	6	5	4	4	2	2	4	1	4	4	4	4	3	4	4	3			
107	0	6	5	5	5	5	5	5	2	5	5	5	5	5	4	4	2	4	4	5
108	1	6	5	5	5	5	5	1	1	1	5	5	5	5	5	5	1	5	5	5
109		6																3	3	3
110	1	6	5	5	5	3	5	3	5	5	5	5	5	5	5	5	3	5	5	5
111	1	6	5	5	5	4	4	4	3	2	4	5	2	5	5	5	2	3	4	4
112	3	6	4	4	4	4	4	3	3	2	4	4	4	4	2	4	2	3	3	5
113	1	5	4	4	3	3	3	3	4	3	4	4	4	3	3	4	3	3	3	3
114	1	6	5	5	5	5	5	1	1	3	5	5	5	5	5	5	4	5	5	5
115	1	6	4	4	4	4	4	2	4	3	4	2	4	3	2	3	2	3	3	4
116	1	6	5		4	2		2		4	4	4			4	4	2	5	5	5
117	2	5	5	4	4	4	4	4	4	4	4	4	2	4	4	4	2	4	4	4
118		6	5	5	5	4	4	2	4	2	5	4	3	4	2	5	2	4	4	4
119		6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		4
120	1	6	4	3	4	4	3	4		5	4	4	4	4	3	4	2	4	4	5
121	1	6	5	5	5	5	4	2	4	2	5	5	1	5	5	5	1	5	5	5
122	1	6	5	1	5	1	1	5	1	5	5	1	5	5	5	5	1	5	3	5
123	1	6	5	2	5	2	5	2	4	2	4	2	4	4	5	4	2	1	4	4
124	1	6	5	5	5	5	4	4	5	3	4	4	4	2	4	4	2	4	4	4
125	1	6	5	0	5		5		1	2	4	4	4	5	5	5	1	3	5	5
126																		4	4	4
127	1	6	5	5	5	4	5	1	4	4	4	4	4	2	4	4	1	5	5	5
128		6	5	5	5	2	4	2	4	4	5	4	4	5	1	5	4	2	2	4
129		6	5	5	5	4	4	4	5	3	5	4	5	4	5	4	3	3	4	3
130		6	5	1	1	1	4	4	2	4	4	2	2	4	2	4	2	3	4	4
131		6	5	2	3	1	3	3	2	3	4	2	4	4	2	4	3	2	4	4
132	1	6	2	2	2	2	1	5	1	3	5	3	3	5	3	5	5	1	5	5
133		6	3	5	5	2	5	5	2	2	5	2	2		5	2	2	5	5	5
134	1	6	4	4	4	3	5	5	5	5	5	5	5	5	5	5	1	5	5	5
135		5	5		5		5					4	4	5				4	0	4
136	1	6	2	3			5		3	3	5	1	5	5	5	5	5	1	5	5
137	1	6			4		4				4			4				5	5	5
138	1	6			0															
139	1	6	5	5	5	4	5	2	5	3	5	4	4	4	4	3	1	3	3	3
140	1	6	5	4	5	3	4	2	3	3	4	5	4	4	4	4	2	3	2	2
141	1		5	5	5	5	5	1	2	2	4	0	3	4	4	4	2	4	4	5
142	1	5	5	5	5	5	5	1	2	2	4	4	2	4	4	4	2	4	4	5
143	1	5										0	0					5	5	5
144	1	5	5	4	4	4	4	2	4	3	4	4	4	2	3	4	2	3	4	3
145	1	5	4	4	5	4	3	3	4	2	3	2	4	3	4	4	2	4	4	5
146			4	4	4	2	4	4	4	2	4	4	4	4	2	4	3			
147																		1	1	1
148																				
149																				
150																				
151																				
152																				
153																				
154																				
155	1	5	4	5	5	4	4	2	1		5			5	4	4	1	4	4	5
156																				
157																				
158																				
159																				
160	1	6	4	4	5	5	5	2	2	2	4	2	5	5	1	3	1	5	5	5
161																				
162																				
163	1	6	5	2	5	3	4	3	3	4	4	4	4	5	4	2	1	2	4	5
164																				
165	1	5	4	4	4	3	4	3	3	4	4	2	4	4	4	4	2	3	3	4
166	1	6	5																	
167	1	5	5	5	5	5	3	1	1	1	3	1	1	2	4	4	4	5	4	5
168																				
169																				
170																				
171																				
172																				
173	1		5	2	4	4	3	5	2	3	3	4	3	4	4	3	3	5	5	5
174		6	5	4	5	4	4	4	2	4	4	4	4	2	4	4	2	2	4	5
175	1	4	5		5	2	3	5	2	3	5	5	4	4	2	4	1	5		
176																				
177		6	4	2	4	4	4	4	2	2	4	4	4	4	2	4	2	3	4	4
178	1	6	5	5	5	5	5	2	5	2	5	5	5	5	5	5	1	4	4	5
179	1	6	5	5	5	4	4	4	2	3	5	3	3	4	4	4	2	3	3	4
180	1	6	5	5	5	5	5	4	4	3	5	5	5	5	5	5	2	5	5	5
181	1	6	2	4	4	4	5	2	4	2	2	2	4	2	2	2	2	4	4	5
182		6	5	5	5	5	5	4	4	2	5	5	4	5	4	5	4	5	5	5
183		6	4	4	4	4	5	2	4	4	5	2	4	4	2	4	2	4	4	4
184	2	6	5	5	5	5	5	2	2	2	2	5	5	5		5	5	2	2	3
185			5	3	4	4	3	3	4	3	3	3	3	3	3	3	3	3	3	3
186		6	2	3	3		5	2	5	3	5	5	5	5	4	4	2	5	5	5
187	1	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
188																				
189																				
190	1	1	5	5	5	5	5	2	4	2	4	2	5	4	2	5	2	4	4	4
191	1	6	5	4	4	2	4	3	3	4	4	4	4	4	4	4	2	2	4	5
192	1	5	5	3	4	2	4	2	4	2	4	2	4	4	2	4	2	2	3	4
193																				
194	1	6	2	4	4	2	4	2	4	2	4	4	4	3	3	3	2	4	4	4
195		6																		
196	1	6	5															5		
197		6																3	5	5
198																				
199	1	6	4	4	5	4	4	2	2	4	4	4	4	4	2	4	1	4	4	4
200	1	5	5	5	5	5	5	2	5	2	5	3	5	5	5	5	2	5	5	5
201	1	5	5	5	5	5	5	2	5	2	5	3	5	5	5	5	2	5	5	5
202		6	4	3	4	4	4	3	3	2	3	4	3	4	2	4	2	4	4	4
203			5	5	5	2	5	2	2	2	5	3	5	5	5	5	2	5	5	5
204	1	5	5	5	5	5	5	5	5	2	5	4	5	5	2	5	1	5	5	5
205	1	6	2	5	4	1	4	1	4	2	4	4	4	4	4	4	1	3	4	5
206		6	4	4	5	5	5	3	4	2	5	2	4	4	5	5		4	4	4
207	1	6	5	5	5	5	5	5	4	2	5	3	5	5	5	5	2	4	4	5

Table G.1. Continues

NO	V37_4	V37_5	V37_6	V38_2	V38_3	V38_4	V38_5	V38_1	V39_1	V39_2	V39_3	V39_4	V39_5	V39_6	V40_1	V40_2	V40_3	V40_4	V41_1	V41_2
1																				
2								5	5						2	2	1	2	5	
3	1	2	2	4	4	4		4	1	1	5	5	5	1	2	2	2	1		2
4	5	4	5	4		4		4	3	4	3	4	4	2	2	2	2	1	2	5
5																				
6	2	2	2			4		4	3	3	3	3	4	4	2	1	2	2	4	4
7	2	2	2			4		4	3	3	3	5	5	3	2	2	2	1	2	5
8	5	5	5	4		5		5	2	2	2	5	5	5	1	2	2	2	2	5
9	4	3	3	5	3			3	2	4				1	2	2	2	1		
10																				
11	3	3	3	3	2	3		3	4	4	4	4	4	3	2	2	2	1	4	4
12	5	5	5	4	5	2	5	2	4	5	0	5	5	1	1	2	2	2	1	5
13	3	3	3	3		4	4	4	3	4	3	3	3	2	2	2	2	1	2	4
14	4	4	4	4	3			3	4	4	4	5	5	2	2	2	2	1	3	4
15	3	3	3		4	4	5	4	2	4	2	4	3	2	2	2	2	1	3	5
16	5	3	3			5	5	3	3	2	4	3	5	4	2	2	2	2	3	4
17	5	3	2	3				2	5	2	5	5	5	3	2	1	2	1		
18	3	2	2		3	2		3	4		4		4	2	2	2	2	1	4	3
19	5	5	5	4	3	4	5	4	2	5	1	4	4	1	2	2	2	1	1	5
20	4	5	5	5	4	4	5	4	2	5	2	3	4	2	2	2	2	1	2	4
21	4	3		3	4	4	0	3	5	2	2	3	4	3	1	2	2	2	3	4
22	5	5	3	4	4	4	4	4	3	4		4	4	2	2	2	2	1	3	3
23	4	3	5	3	2	3	2	4	4	3	2	1	3	4	2	2	2	1	3	4
24	3	3	5	3	3	3	3	3	4	4	3	4	4	4	2	2	2	1	3	3
25	4	3	4	3	3	3	4	4	5	4	2	4	5	1	2	2	2	1		
26																				
27	4	2	4	3				3	5	4					2	2	2	1		
28	4	3	3	4	3	4	5	4	2	4	4	3	2	3	2	1	2	2	4	2
29	4	2	2	3		4	3	3	4	2	4	4	4	3	2	2	2	1	2	5
30	5	3	4			4	5	3	4	3	3	4	5	1	2	2	2	1	3	3
31	5	5	5	4		4	4	4	1	1	1	1	1	5	2	2	2	1	1	5
32	4	3	3					3	5	1	5	4	5	5	2	2	2	1	5	5
33	4	3	4	3	2	3	4	4	3	4	3	4	4	2	2	2	2	1	3	4
34	4	4	5			4	5	4	3	4	0	5	1	4	2	2	2	1	3	3
35	4	3	3		4	4	0	3	3	3	3	4	4	3	2	2	2	1	3	3
36	5	2	4	3	3	4	0	2	2	3	4	3	3	4	2	2	2	1	2	4
37	4	5	4	4		4	0	4	3	3	2	2	5	1	2	2	2	1	2	3
38	2	2	2	3		4	5	3	4	2	4	2	2	2	2	2	2	1	5	1
39																				
40	5	3	3	3	3	3	5	3	3	1	4	4	5	1	2	2	1	2		
41	3	3	3			4	4	3	4	2	3	3			2	2	2	1		
42	5	4	3	3		3	0	3	1	2	4	3	3	3	2	1	1	2	5	4
43	4	3	4		4	4	5	3	2	2	4	4	3	3	2	2	1	2	2	4
44	4	3	3	3	4		4	3	3	2	4	4	5	2	2	2	2	2	3	4
45	2	2	4					2											4	4
46	4	3	3	3	3			3	3	2	4	3	4	3	2	2	2	1	2	4
47	4	3	3	5	4	4	5	4	3	2	2	4	4	4	1	2	2	1	4	3
48	3	2	2			4	4	3	3	3	3	3	3	2	2	2	2	1	4	3
49	4		3	5				2	4	3	4	0	0		2	1	2	2	4	3
50	4		4		4	5	5	4	3	4	2	3	2	3	2	2	2	1		
51	4	4	0	4	4	4	4	3	4	5	4	5	4	4	2	2	2	1	4	4
52	5	3	4	3	3	3		3	4	4	4	5	5	5	2	2	2	1	5	5
53	3	3	4					5	3	4	4	4	4	2	2	2	2	1	3	4
54	1	5	5		1	1		1	5	1	5								5	1
55	4	4	5			4	4	3	4	4		2	3	3	2	2	2	1	5	2
56	5	5	5	4				4	5	4	3	5	5	1	2	2	2	1	4	3
57	5	3	5		5	5	5	3	2	1	5	5	5	4	1	2	1	2	5	1
58	3	2	2	3	3	4	4	3	3	2	4	5	5	5	2	2	2	1	3	5
59	5	4	3	3	4	4	5	4	5	3	3	5	5	3	2	2	2	1	2	4
60	5	5	5	4		4	4	4	1	1	1	1	1	5	2	2	2	1	3	3
61	5	5	3		4	4	5	3	4	5	3	4	4	3						
62	4	3	2	4	4	4	4	4	3	2	2	5	5	1	2	2	2	1	2	4
63	5	2	2	2	3	4	4	2	2	2	4	2	2	2	2	2	2	1	2	5
64		2	1	4	6	6	6	1	5	1	5			5	2	2	2	1	5	
65	4	3	2	3	4	5	5	3	2	1	5	1	3	1	1	2	2	2	2	5
66	4	3	4			4	4	3	4	2	4	3	4	3	1	2	2	2	2	4
67	4	3	3		5	5			3	3	3	5	5		2	2	2	1	3	3
68	5	3	5		3	4	5	3	3	2	5	3	3	3	2	2	2	1	3	5
69	4	3	3	3		4	4	3	4	2	3	5	5	5	2	2	2	1	4	4
70	5	3	3	4		4	4	2	3	2	4	3	4	1					3	4
71	4	3	3	4		4		4	3	3	3	3	5	4	2	2	2	2	2	5
72	4	2	2	3	3	3	4	1	5	1	5	2	5	2	1	2	2	2	4	5
73						4	5	3												
74	4	4	4					3	3	3	4		5	4	2	2	2	1	3	3
75	4	2	4	2	3	3	3	2	5	2	4	5	5	4	1	2	2	2	4	5
76	5	4	5			2		2	3			4	4		2	2	1	2		5
77																				
78	5	4	5	3	2		5	3	3			5	5	3	2	2	2	1	3	4
79	4	3	4	4	4	4		4	4	2	3	4	4	3	1	2	2	2	2	4
80	5	2	4	1	5	5		1	5	1	5	1	5	5	1	2	2	2	5	5
81	5	2	4	1	5	5		1	5	1	5	1	5	5	1	2	2	2	5	5
82	5	2	4	1	5	5		1	5	1	5	1	5	5	1	2	2	2	5	5
83	5	2	4	1	5	5		1	5	1	5	1	5	5	1	2	2	2	5	5
84					5	4	5	4	5	1	5	3	5	3	2	2	2	1	1	4
85	4	3	3			3	4	3	4	3	4	4	4	3	2	2	2	1	4	4
86	3	3	3	4		4	5	4	3	4	3	4	4	2	2	2	2	1	3	3
87	4	4	3		4			3		5		5	5	4	2	2	2	1		5
88	3	3	3		4	0	4	4	3	5	3	5	5	5	1	2	2	1	2	5
89				4	3															
90																				
91	3	3	4	3	3	3	5	3	3	2	3	4	5	3	2	2	2	1	4	2
92	4	2	1	3		3	4	2	2	1	4	4	4	2	2	2	1	2	2	4
93	5	5	5	4		4	5	5	3	5	3	5	5	2	2	2	2	1	5	5
94	5	3	5	5	5	5	5	4	3	3	3	3	3	3	2	2	2	1	1	5
95	3	3	3												2	2	2	1	1	5
96	5	2	2	3	1	3	1	1	5	1	5	5	5	1	1	2	2	2	1	5
97	5	2	2	3	5	5	5	3	5	1	5	1	1	1	2	2	2	1	5	1
98	3	2	3	4	3	4	3	3	4	2	4	5	4	3	2	2	2	1	2	4
99	4	3	4	5	4	5	5	5	3	4	3	4	4	3	2	2	2	1	3	4
100	4							2	5				4	4	1	2	2	1		
101	5	3		3	3	5	4	4	2	4	4		4		2	2	1	2	2	2
102	4	3			4			4	3		4		4	4	2	2	2	1		

Table G.1. Continues

NO	V37_4	V37_5	V37_6	V38_2	V38_3	V38_4	V38_5	V38_1	V39_1	V39_2	V39_3	V39_4	V39_5	V39_6	V40_1	V40_2	V40_3	V40_4	V41_1	V41_2
103	5	5	5	4	4	4	4	4	3	3	3	3	3	3	2	2	2	1	3	3
104	5	5	1	3	3	3	2	4	1	2	1	2	0	2	2	1	2	1	5	2
105																				
106																				
107	5	5	4	5	2	4	4	4	5	4	5	5	5	5					4	5
108	5	2	3	1	1	3	5	3	2	4	4	5	4	2	2	2	2	1	5	3
109	3	3	4	4	4	4	4	4	3	3	3	3	3	3	2	2	1	2	3	
110	5	5	5	5		5		5	5	5	0	5	5	0	2	2	2	1		
111	4	3	3	5	4	4	5	4	3	4	3	4	5	3	2	2	2	1	3	4
112	5	2	2	4	4	4	4	3	4	3	4	3	3	3					5	3
113	3	3	3	3	3	3		4	3	3	3	4	4	4	2	2	2	1	3	3
114	3	2	1	3	5	2	5	2	1	5	5	1	5	5	2	2	1	2	5	5
115	3	3	2		3	4	4	4	4	2	4	3	4	4	2	2	2	1		
116	5	3	5	4	4	0	4	4	3	5	5			2	2	1	2	2		4
117	4	3	3	4	4	4	4	4	3	3		4	4	4	2	2	2	1	2	3
118	4	3	4	3			4	3	3	5		4	4	4	2	2	2	1	3	4
119		4	4					3	4	2	4	2	2	2	2	2	2	1	4	
120	5	4	5	0	5	5	4	4	4	4	2	2	4	4	2	2	2	1	2	4
121	5	4	5	0	0	4		3	3	2	4	5	5	3	2	2	2	1	3	5
122	3	3	5	3	3		3	3	5	1	5	5	5	5	2	2	2	1	5	5
123	4	2	2	0	2	2		2	4	2	4	4	4	2	2	2	2	2	1	5
124	4	4	4	3	3		5	3	4	4	4	4	4	4	1	2	2	2	3	4
125	5	5	5	5	5			5	3	5	2	3	4	1	2	2	2	1		
126	4	4	3																	
127	5	3	4	1	4	4	5	3	4	4	3	2	4	1	2	2	2	1	2	5
128	4	4	4	4	4	4	4	4	3	2	2	2	5	2	2	2	2	1	4	4
129	3	2	3	3	4	3	5	3	4	3	3	5	5	2	2	2	2	1	3	5
130	4	3	4	4	3	4	5	3	5	5			5	4	2	2	2	1	2	4
131	4	3	4	4	3	4	5	3	4	5	3	4	4	4	2	2	2	1	2	3
132	5	3	3					4	3	5	3	1	1	5	2	2	2	1	3	3
133	5	5	5	4	5	4	5	4	3	2	2	5	5	2	2	1	2	2	5	3
134	5	5	5		5	5		5	3	5	3	5	5	3	2	2	2	1	5	2
135	2	3	5					3	5	1										
136	5	3	3		4					5			5	5	2	2	2	1		
137	5	5	5	4		4		4	3	4		3	2	4	2	2	2	1		4
138																				
139	3	3	3	3	3	3	3	3	4	4	4	4	3	5	2	2	2	1	3	3
140	2	2	2	3	3			3	4	3		5	5	4	2	2	2	1		
141	5	5	5	4	3	3	5	4	4	4	2	4	4	1	2	2	2	1		
142	5	5	5	4	3	3	5	4	4	4	2	4	4	1	2	2	2	1		
143	5	3	5	4		5		4	4	1	4	4	4	1	2	2	2	1	2	5
144	4	3	2			3	4	4	5	4	3	4	3	1	2	2	2	2	4	3
145	5	4	5	3	3	3	3	3	4	2	4	4	5	2	2	2	2	1	4	5
146																				
147	1	2	1																	
148																				
149																				
150																				
151																				
152																				
153																			4	5
154																				
155	5	5	5			5		4	4	5		5	5	4	2	2	1	1		5
156																				
157																				
158																				
159																				
160	5	3	4	5	5	5	5	4	1	5	5	5	1	1	2	2	2	1	2	4
161																				
162																				
163	5	3	3	3	4			3	3	1	4	3	4	2	2	2	2	1	3	2
164																				
165	3	3	3	3	3	3	5	3	3	4	3	4	4	3	0	0	0	0	2	4
166																				
167	3	3	3	3				3	3	5	3	3	4	4	2	2	2	1	5	5
168																				
169																				
170																				
171																				
172																				
173	5	5	5			4	0	4	3	5	2	3	3	3						
174	2	2	2	5	4	3	5	3	3	5	3	4	4	3	2	2	2	1	3	4
175											3	4	4	2	2	2	2	1		
176																				
177	3	3	4		4	3	5	4	4	2	4	4	5	3	2	2	2	1	2	4
178	2	3	4	4	4	4	4	3	4	2	4	2	2	1	2	1	2	2	2	4
179	5	4	4	4	4	4	4	4	3	5	3	4	5	4	2	2	1	2	3	4
180	5	5	5	4		5	5	4	2	4	2	4	4	2	2	2	2	1	2	4
181	2	2	2	4	2	2	4	3	2	2	4	2	4	2	2	2	2	2	4	4
182	5	5	5			5		5	5	5	5	5	5		1	2	2	1	4	5
183	4	3	4		4			4	3	5	2	4	4		2	2	2	1	2	4
184	2	2	2			3		1	5		5		1							
185	3	2	2		3	3	4	3	4	4		5	5	4	2	2	1	2	3	5
186	5	4	4				4	4	4	1	3	3	4	4	2	2	2	1	3	5
187	4	4	4	3		3		3	5	5		2	5	2					4	4
188																				
189																				
190	4	3	4			4		3	4	3	2								5	5
191	5	3	4	4	3	4	5	4	3	3	3	4	2	3	2	2	2	1	4	3
192	4	4	4	3	3	5	5	4	5	4	3	5	5	3	2	2	2	2	4	3
193																				
194	4	2	4	3	2	4	4	3	4	2	4	2	4	2	2	2	2	1	3	4
195																				
196	4							2			4				2	2	2	1		
197	5	3	2	2	3	4	4	4												
198																				
199	4	3	3	4	4	4	5	4	3	5	1	3	3	4	2	2	2	1	2	4
200	5	5	5	4	2	3	4	4	2	3	2	4	4	2	2	2	2	1	3	4
201	5	5	5	4	2	3	4	4	2	3	2	4	4	2	2	2	2	1	3	4
202	4	3	4	0	4	4		4	3	2	3	4	4	2	2	2	2	1	3	4
203	5	5	5	5	5	5		5	2	5	2	2	5	2	2	2	2	1	3	5
204	3	3	3				4	4	4	4	3	4	4	2	2	2	2	1	4	3
205	5	3	4	5	3	4	5	4	3	2	4	3	3	3	2	2	2	1	3	4
206	4	3	3	4	5			4	3	3	3	3	3	3	1	2	2	2	2	5
207	2	2	3					3	3	5	3	4	2	3	2	2	2	1	2	5

Table G.1. Continues

NO	V41_3	V41_4	V41_5	V41_6	V41_7	V42	V42A1_1	V42A1_3	V42A1_5	V42A1_3_5	V42A1_2	V42A1_4	V42A2_1	V42A2_2	V42A3_1	V42A3_2	V42A3_3
1																	
2						2											
3	2	1	2	2	5	2											
4	3	3	3	1	4	3											
5						1	1	2	2	1	2	2				1	
6	4	4	4	4	4	1	2	1	1	2	2	2	2000	2000	1		
7	5	5	3	2	5	1	2	1	1	2	2	2	2000	2000	2	2	2
8	4	4	5	4		1	1	1	2	2	2	2		150	1	2	2
9						2											
10						2											
11	4	4	4	3	5	2											
12	5	1	5	1	5	2											
13	5	1	5	2	3	2									1		
14	3	2	4	3	3	1	1	2	2	1	2	2			1	2	2
15	3	3	3	2	2	2									2	2	2
16	4	2	5	3	2	4	1	2	2	1	2	2					
17																	
18	2	4	3	2	3	3											
19	5	1	5	2	4	2											
20	2	4	3	2	3	2											
21	3	1	5	5	5	1	1	1	1	3	1	1	25000	20000			
22	2	2	3	2	4	2											
23	2	1	4	3	4	2											
24	3	3	3	3	3		2										
25						2											
26																	
27						2									1	2	2
28	2	2	4	4	4	2									1	2	2
29	2	2	4	4	3	2											
30	1	1	5	1	1	2											
31	5	1	5	5	5	2									1	2	2
32	5	1	5	5	5	2	1			1							
33	3	3	4	3	4	2											
34	3	3	3	3	3	2											
35	3	3	4	3	3	2	1	2	2	1	2	2					
36	4	2	4	3	1	1	2	2	1	1	2	2	20000		1	2	2
37	3	2	4	3	2	2											
38	1			1		1	1	2	2	1	2	2					
39																	
40							1	2	2	0	2	2			1	2	2
41						2											
42	3	2	4	4	4	2											
43	4	3	5	3	0	2											
44	4	2	5	3	3	1	1	2	2	1	2	2			1	2	2
45	2	2	4	1	5	2											
46	3	2	4	3	4	1	1	2	2	1	2	2			1	2	2
47	3	4	4	3	3	2									1	2	2
48	3	3	2	3	3	2											
49	3		3	4	3	2											
50						2											
51	4	4	4	4	3	2											
52	2	4	2	2	2	2											
53	2	5	5	2	4	2											
54	1	4	1	1	3	1	1	2	2	1	2	2					
55	5	3		1	5	1	1	2	2	1	2	2			2	1	2
56	3	5	3	3	5	1	2	1	1	2	2	2		400	1	2	2
57	2	2	4	1	5	2											
58	3	5	3	5	5	2											
59	2	2	4	2	3	2											
60	1	5	3	1	3	2											
61						1	2	2	2	0	2	2					
62	4	4	3	2	4												
63	3	3	3	3	4	2											
64						1	2	2	2	0	2	2	13000	216	2	2	2
65	4	2	4	4	5	1	1	2	2	1	2	2			1	2	2
66	3	2	4	3	4	1	1	2	2	1	2	2			1	2	2
67	3	3	3	3	3	2											
68	5	2	5	5	5	1	1	2	2	1	2	2			1	2	2
69	3	2	5	2	3	1	1	2	2	1	2	2			2	2	2
70	3	3	4	1	1	1	1	2	2	1	2	2					
71	5	1	5	3	5												
72	5	2	4	4	4	1	1	2	2	1	2	2			2	2	2
73						2											
74	3	3	5	2	0	2											
75	4	2	5	2	5	1	1	2	2	1	2	2			2	2	2
76						2											
77																	
78	1	2	4	2	5	2											
79	3	3	3	2	5	2											
80	5	1	5	1	2	1	1	2	2	1	2	2	180		1	2	1
81	5	1	5	1	2	1	1	2	2	1	2	2	180		1	2	1
82	5	1	5	1	2	1	1	2	2	1	2	2	180		1	2	1
83	5	1	5	1	2	1	1	2	2	1	2	2	180		1	2	1
84	1	1	5	1	5	2											
85	3	4	3	3	3	2									2	2	1
86	2	2	5	4	4	2											
87	5	3	5	3	5	2											
88	4	2	5	4	5	2									1	2	2
89						2											
90																	
91	3	3	3	3	5	1	2	1	1	2	2	2	60000	6000	1	2	2
92	4	2	5	4	4	1	1	2	2	0	2	2	60000	4000	2	2	2
93	2	3	2	2	3	2											
94	3	3	3	3	5	1	2	2	2	0	2	2			1	2	2
95	5	5	5	5	5	2											
96	5	1	5	1	1	2											
97	1	1	5	1	5	2											
98	2	0	4	2	3	2											
99	2	4	3	3	4	2											
100						2											
101	3	3	2	4	4	2											
102															2	2	2

Table G.1. Continues

NO	V41_3	V41_4	V41_5	V41_6	V41_7	V42	V42A1_1	V42A1_3	V42A1_5	V42A1_3_5	V42A1_2	V42A1_4	V42A2_1	V42A2_2	V42A3_1	V42A3_2	V42A3_3
103	3	3	3	3	3	2											
104	1	4	1		3	2	1	2	2	1	2	2	1000		2	1	2
105																	
106						2											
107	5	1	4	3	4	2											
108	1	5	5	1	2	2											
109						2									2	2	2
110						2									1	2	2
111	3	3	3	3	3	2											
112	1	4	3	3	4	1	1	2	2	1	2	2			1	2	2
113	2	2	4	2	4	2											
114	1	5	5	1	4	2							20000	2000	1	2	2
115		4				2	2	2	2		2	2			1	2	2
116	2	5		1	5	1	1	2	2	1	2	2			1		
117	2	2	2	3	3	2											
118	2	2	4	2	5	2											
119	4	4	4	4	4	2											
120	4	2	4	2	3	2											
121	2	2	3	1	3	1	1	2	2	1	2	2			2	2	2
122	5	5	5	1	1	1	1	2	2	1	2	2			1	2	2
123	2	2	5	2	2	1	1	2	2	1	2	2			1	2	2
124	2	2	3	2	3	1	2	2	1	1	2	2			2	1	2
125			4	3	2	2									1	2	2
126						2											
127	4	1	5	1	3	2											
128	2	3	3	3	3	2											
129	4	2	4	3	3	2											
130	3	2	5	1	1	2											
131	4	2	4	1	4	2											
132	3	5	3	3	5	1	1	2	2	1	2	2					
133	3	3	3	3	3	2									1	2	2
134		3	3	3	3	2							45000	5000	1	2	2
135						1	2	2	1	1	2	2					
136						2											
137	4		4	0	0	2											
138																	
139	3	3	3	3	3	2											
140						2											
141																	
142						2											
143	3	1	5	3	3	2											
144	3	4	3	3	3	2											
145	3	3	3	2	3	2											
146																	
147																	
148																	
149																	
150																	
151																	
152																	
153	4	4	5	2	2	1	1	2	2	1	2	2			1	2	2
154																	
155	4	4	4	2	4	2											
156																	
157																	
158																	
159																	
160	2	2	5	2	5	2											
161																	
162																	
163	1	1	5	3	3	2											
164																	
165	3	3	3	2	4	0											
166																	
167	5	5	3	5	3	1	1	2	2	1	2	2					
168																	
169																	
170																	
171																	
172																	
173						2											
174	4	4	3	3	4												
175						2											
176																	
177	3	4	4	3	4	2									2	2	1
178	1	2	4	2	5	1	1	2	2	1	2	2			1	2	1
179	5	3	4	3	5	2											
180	2	4	4	2	4	2											
181	4	2	4	2	4	1	1	2	2	1	2	2					
182	5	2	5	5	2	2									1	1	1
183	1	3	3	2		2											
184																	
185			5	1	3	1	1	2	2	1	2	2	100000	10000	1	2	2
186	5	5	5	3	4	1	1	2	2	1	2	2			1	2	2
187	4	5	4	2	2	1	1	2	2	1	2	2					
188																	
189																	
190	4	2	4	2	4	2											
191	2	4	4	2	3	1	1	2	2	1	2	2			1	2	2
192	3	2	5	5	5	2											
193																	
194	2	2	4	2	4	2											
195																	
196		4				1	2	1	2	1	2	2			1	2	2
197																	
198																	
199	2	2	4	2	2	2											
200	3	4	4	2	4	2									1	2	2
201	3	4	4	2	4	2									1	2	2
202	3	3	3	3	4	2											
203	5	3	5	2	4	1											
204	3	4	3	4	2	2											
205	5	3	5	3	4	2											
206	5	2	5	2	5	2									1	2	2
207	4	1	5	1	4	2											

Table G.1. Continues

NO	V42A3_4	V43A3_5	V42A3_6	V42A3_7	V42A3_8	V42A3_9	V42A3_10	V42A3_11	V42A4	V42B1_1	V42B1_2	V42B1_3	V42B1_4	V42B1_5	V42B1_6	V42B1_7
1																
2				7					2	5						
3										5	4	5	5	5	1	1
4									2	3	4	3	4	4	1	1
5			1						2	4	4					
6								1	2	2	4					
7	2	2	1	1	2	2	2	2	2	5	5	3	4	5	3	3
8	2	1	2	2	2	2	2	2	2	2	4	1	5	5	1	1
9																
10										1	1	4	3	3	1	3
11										3	3	3	3	3	3	3
12										1	4	2	5	5	1	1
13								1	2	3	2	2	5	5	2	3
14	2	2	1	2	2	2	2	2	1	3	3	2	4	4	2	1
15	1	2	1	2	2	2	2	2	2	2	3	3	3	3	2	2
16										3	4	4	4	3	5	3
17																
18										3	2	4	4	2	2	4
19										4	1	1	5	5	1	1
20																
21									1							
22													4			
23										1	2	1	5	4	3	2
24									2	5	5	3	3	3	3	3
25																
26																
27	2	2	2	2	1	2	2	2	2	5						
28	2	2	2	2	2	2	2	1	2	4	2	2	4	4	2	2
29										3	3	2	4	4	1	3
30										3	3	3	3	3	2	2
31	2	2	2	2	2	2	2	2	2	1	4	1	4	4	1	1
32													5	5		
33										2	3	2	4	4	2	2
34									2							
35									2	3	3	3	3	3	3	3
36	1	2	2	2	2	2	2	2	1							
37										3	4	1	4	4	1	1
38									1							
39																
40	2	2	1	2	2	2	2	2								
41										5	4	2	4	4	2	3
42										2		5				
43										4	4	2	4	4	2	3
44	2	2	1	2	2	2	2	2	2	2	2	3	4	4	3	3
45																
46	2	2	2	2	2	2	2	1	1							
47	2	2	1	2	2	2	2	2	2	4	4	3	4	4	2	2
48										3	3	3	4	3	3	3
49										4	3	3	4	3	2	2
50																
51																
52									2	0	5	5	5	5	3	2
53									0	3	4	4	4	2	3	2
54												5			3	5
55	2	2	2	2	2	2	2	1	1							
56	2	2	2	2	2	2	2	1	2	4	5	1	3	5	3	1
57										4	4	2	5	4	1	2
58										3	4	3	4	5	3	3
59									4	2	2	2	4	4	2	2
60										3	3	2	4	2	2	3
61																
62									2	3	2	1	5	5	1	1
63										2	2	5	3	4	1	4
64	2	2	1	2	2	2	2	2	1	0	4	1	1	5	5	1
65	2	2	2	2	2	1	2	2	1							
66	1	2	2	2	2	2	2	2	2			4				
67																
68	2	2	2	2	2	2	2	1	2	3	3	3	5	5	3	3
69	2	2	1	2	2	2	2	1	2	3	3	3	5	4	3	3
70									1							
71									2	3	4	1	5	5	1	1
72	2	2	2	2	1	1	2	2	1							
73																
74																
75	2	2	2	1	1	2	2	2	2	4	5	4	4	4	3	4
76													5			
77																
78										4	3	2	4	3	1	3
79										4	3	3	4	3	3	3
80	2	2	1	2	2	2	2	2	1							
81	2	2	1	2	2	2	2	2	1							
82	2	2	1	2	2	2	2	2	1							
83	2	2	1	2	2	2	2	2	1							
84												5				
85	2	2	2	2	1	2	2	2	1	4	4	4	4	4	3	3
86												2	4		2	2
87										5			5	5	4	3
88	2	2	2	2	2	2	2	1	2	5	5	2	4	4	2	2
89																
90																
91	2	2	2	2	2	2	2	1	1							
92	2	2	2	1	2	2	2	1	2	4	5	4	4	4	4	3
93										3	2	1	4	4	2	1
94	2	2	2	2	2	2	2	1	2	3	5	2	3	4	2	2
95										2	4	2	2	4	3	2
96										5	5	5	5	5	1	5
97										5	1	5	5	5	1	1
98										2	2	4		4	2	3
99									2	2	4	3	4	4	3	3
100									2							
101									2	4	4	2	4	4	3	2
102	2	2	1	2	2	2	2	1								

Table G.1. Continues

NO	V42A3_4	V43A3_5	V42A3_6	V42A3_7	V42A3_8	V42A3_9	V42A3_10	V42A3_11	V42A4	V42B1_1	V42B1_2	V42B1_3	V42B1_4	V42B1_5	V42B1_6	V42B1_7
103										3	3	3	3	3	3	3
104	2	2	1	2	2	2	2	2	1							
105																
106										5	5	3	4	4	1	2
107									2							
108										1	2	2	5	5	1	3
109	2	1	2	2	2	2	2	1	2	3	3	3	3	3	3	3
110	1	1	2	2	2	2	2	1	2	5	5					
111										3	3	3	3	3	3	3
112	2	2	2	2	1	2	2	2	1							
113										2	3	2	4	4	3	3
114	2	2	2	2	2	2	2	1	2	5	5	4	4	2	2	2
115	2	2	2	2	2	2	2	1	2							
116									2		5					
117										3	3	2	4	3	1	2
118									2							
119										4	0	4	0	4	0	4
120										2	4	2	4	4	2	2
121	2	2	2	2	1	2	2	1	1							
122	2	2	2	2	1	2	2	2	2	3	5	3	5	5	3	3
123	2	2	2	2	2	2	2	1	1	2	2	2	4	4	2	4
124	2	2	2	2	2	2	2	1	2	3	4	3	2	2	3	3
125	1	1	1	2	2	2	2	2	2		4	2		5	2	5
126													5	5	1	1
127										3	3	2	5	5	1	1
128																
129										4	3	2	4	4	3	3
130										2	3	3	4	4	2	2
131										3	4	4	4	3	2	2
132									2	3	1	3	3	3	2	3
133	2	1	2	1	2	2	2	1	2	2	5	2	2	3	3	2
134	2	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3
135																
136									2			3	5	3	1	3
137																
138																
139										3	4	3	3	3	2	2
140																
141											5					
142											5					
143									5	4	1	4	4	1	3	1
144										2	4	2	4	4	2	3
145										3	3	2	4	4	3	2
146																
147																
148																
149																
150																
151																
152																
153	1	2	2	2	2	2	2	2	2	4	2	1	5	5	1	1
154																
155										5	1	5	5			5
156																
157																
158																
159																
160										2	2	1	5	4	1	1
161																
162																
163										3	2	4	0	4	3	0
164																
165																
166																
167									1	5	2	3	3	2	1	1
168																
169																
170																
171																
172																
173																
174																
175										4	5	2	0	5	1	1
176																
177	2	2	2	2	2	2	2	1								
178	2	2	2	2	2	2	2	2	2	1	1	5	0	5	2	4
179										3	4	3	5	5	2	2
180										5	5	2	5	5	2	2
181									2			4				3
182	1	1	1	2	2	2	2	2		5	5	4	4	5		5
183																
184																
185	2	2	2	2	2	2	2	1	2	5	5	3	5	5	2	2
186	1	2	2	2	2	2	2	2	2	3	4	3	4	5	1	2
187										4						
188																
189																
190									2							
191	2	2	2	2	2	2	2	1	2	3	2	3	4	3	3	3
192										4	5	2	5	5	1	2
193																
194										3	3	0	4	4	2	3
195																
196	2	2	2	2	2	2	2	1	1							
197																
198																
199										2	3	2	4	4	2	2
200	1	2	2	2	1	2	2	2		5	5	1	5	5	1	1
201	1	2	2	2	1	2	2	2		5	5	1	5	5	1	1
202										3	3	3	4	4	2	2
203																
204										3	3	3	3	3	2	2
205										3	3	3	4	4	2	3
206	1	1	2	1	1	2	2	1	2	2	4	3	4	4	2	3
207										3	5	2	4	5	1	1

Table G.1. Continues

NO	V42B1_11	V42B1_12	V42B1_13	V42B1_14	V42B2_1	V42B2_2	V42B2_3	V42B2_4	V42B2_5	V42B2_6	V42B2_7	V42B2_8	V42C1	V42C2	V42C3	V42C4
1																
2					1								1			
3	2	2	2	2	4	4	4	4	4	4	4	3	3	3	4	4
4	5	5	4	5	5	4	4	4	4	4	4	1	5	3	5	4
5					4	4	4	4	4	4	4	3	2	2	5	5
6				4	5	5	1	1	1	1	1	1	4	4	4	5
7	5	3	1	1	5	5	1	1	1	1	1	1	4	4	5	5
8	2	4	2	2	5	5	5	4		5	4	2	5	4	5	5
9														5		
10	4	5	1	2	3	3	2	4	4	2	2	1	3	5	3	3
11	3	3	3	3	4	4	4	4	4	4	4	2	4	4	4	4
12	5			5		5		5					4	4	5	
13	5	5	3	5	5	5	5	4	5	4	3	2	3	3	3	3
14	4	3	3	4	3	3	4	4	4	3	4	2	4	2	4	4
15	3	3	3	3	5	5	5	5	5	5	5	3	4	4		4
16	2	2	2	4	5	4	3	3	4	3	2	2	5	5	5	4
17																
18	4	3		3	3	3	3	3	4	3	4	2	2	3		4
19	4	5	1	5	5	5	5	4	4	5	2	2	3	2	2	4
20					2	2	2	2	2	2	2	2	3	2	2	2
21													3	5	5	5
22	4															
23	1	4	2	5	4	3	2	3	4	1	3	4	3	5	5	4
24	5	3	5	3												
25																
26																
27																
28	3	4	4	4								5	4	3	4	4
29	4	3	3	4	3	3	4	4	3	3	3	2	3	2	2	4
30	3	3	3	4	4	4	3	3	4	3	1	1	5	4	4	4
31	1	4	1	4	5	5	5	5	5	5	5	5	4	4	4	4
32	5			5	5				5				5	5		5
33	4	3	4	4	4	4	4	4	4	4	4	2	3	4	3	4
34	3	3		3	4	4	4	4	4	4	4	3	2	1		3
35	3	3		3	3	3	3	3	3	3	3	3	3	3	3	3
36													4	4	4	4
37	4	5	2	5												
38													5	4	5	5
39																
40																
41	4	2	4	4									4	3	3	3
42													5	2	5	3
43	4	4		2	4	4	4	3	3	4	3	4	4	3		5
44	2	3	2	2	4	4	4	4	4	3	3	2	5	2	5	5
45																
46													4	3	4	4
47	2	2	2	4	3	3	4	1	3	3	3	2				
48	4	4	2	4	4	3	4	4	4	3	4	1	1	2	2	3
49	4	4	0	4	3	3	3	3	3	3	3	3	4	3	3	3
50																
51					2	4	4	4	4	4	4	4	2	2	2	2
52	3	3	3	5	5	5	5	5	5	4		1	2	4		5
53	4	3	4	4	4	4	4	3	4	3	3	1	2	3	4	4
54	3		1	1	1	1	1	1	1	1	1	1	5	5	5	5
55					5	5	5	5	5	5	1	1	2	4	5	4
56	5	3	0	5	4	4	4	4	4	4	4	3	3	4	5	2
57	4	2	1	2									1	1	5	5
58	5	5	3	5	4	5	5	5	5	5	5	3	4		4	5
59	4	5	4	5	4	4	4	4	4	4	4	2	3	3	3	3
60	4	4		5	5	4	3	3	1	1	1	1	2	1	3	3
61																
62	5	3	3	2	4	4	5	4	4	3	3	1	3	3	4	4
63	4	4	4	4	3	3	3	4	4	3	4	1	5	4	4	4
64													2	2	2	2
65													5	3	5	5
66					4	4	4	4	4	2	4	1	4	3	4	4
67																
68	5	5	3	5									2	2	2	2
69	5	3	3	3	4	4	3	4	4	3	3	3	5	4	4	4
70													3	3	3	3
71	1	4	1	5	5	5	5	5	5	5	5	4	5	4	4	4
72					2	2	5	5	4	2	2	2	5	5	5	5
73													3	3	3	5
74						4										
75	4	4	3	2	3	4	4	4	4	2	4	4	5	5	5	5
76					5	5	5	5								
77																
78	2	3	3	4	5	5	5	3	4	3	5	2	3	5	5	4
79	4	4	4	4	4	4	3	4	4	3	3	3	4	4	4	4
80													4	5	5	5
81													4	5	5	5
82													4	5	5	5
83													4	5	5	5
84																
85	4	3	3	4	2	3	3	3	4	3	3	3	3	2	3	3
86	4	3	4	5	4	4	4	4	4	4	4	4	2	2	4	4
87	4	4	4	4						5		2				
88	5	4	2	4	5	5	5	5	5	5	5	2	4	4	4	4
89					3	2	3	2	3	2	3	3	5	3		
90																
91													4	4	4	4
92	5	2	4	4	4	4	4	2	4	4	2	2	2	4	3	2
93	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4
94	5	5	5	5	4	4	4	4	4	4	4	3	5	4	5	4
95		4	3	3												
96	5	1	1	1	5	5	5	5	5	5	5	1	1	3	4	5
97	5	5	5	1	5	5	5	5	5	5	1	1	5	4	4	5
98	4	3	3	2	3	4	3	4	4	3		3	4	2	5	3
99	3	4	1		4	4	4	2	3	4	2	1	2	2	2	2
100					5		4									
101	4	5	3	4	4	4	5	3	5	4	3	3	2	4	4	4
102													5		5	

Table G.1. Continues

NO	V42B1_11	V42B1_12	V42B1_13	V42B1_14	V42B2_1	V42B2_2	V42B2_3	V42B2_4	V42B2_5	V42B2_6	V42B2_7	V42B2_8	V42C1	V42C2	V42C3	V42C4
103	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
104													4	4	4	3
105																
106	5	5	3	2	4	4	3	4	0	4	5	4	4	5	5	5
107																
108	1	5	0	4	5	4	5	5	5	5	5	1	4	4	4	4
109	3	3	3	3			4			0	4			4	4	
110				5												
111	3	5	5	5	3	3	3	3	3	3	3	3	3	3	3	3
112													4	4	4	4
113	3	3	3	4	4	4	3	3	4	3	3	2	3	4	4	4
114	2	2	2	4	3	3	3	3	2	2	4		5	2	2	5
115																
116	5	5	5													
117	4	3	4	2	3	3	2	3	3	2	2	3	5	4	4	4
118																
119	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3
120	4	3	4	3	4	4	4	4	4	4	3	2	3	3	5	5
121													4	2	0	4
122	5	5	3	5	5	5	5	5	5	5	5	2	4	3	4	4
123	2	2	2	2	4	4	4	4	4	4	4	2	2	3	5	4
124	4	4	4	3	4	4	4	3	4	3	4	2	5	3	4	4
125	4	5	4	4						4	4	2	3	3	3	3
126	1	1	1	2									5	4	5	5
127	5	4	4	1	4	4	4	4	4	2	2	2	5	4	4	5
128					3	3	3	3	3	3	3	3	1	1	1	1
129	3	3	3	4	4	3	4	3	3	2	4	1	4	4	5	5
130	3	2	2	1	2	3	3	4	4	2	4	1	1	1	2	2
131	4	4	4	4	4	4	3	3	4	3	3	1	4	5	5	4
132	5	5	3	2	3	2	2	2	2	3	2	2	1	1	2	3
133												5	4	4	3	3
134	5	3	3	5	5	3	4	5	5	2	5	2	4	4	4	4
135																
136	5	0	0	0	3	2	2	2	2	3	0	3	4	3		4
137																
138																
139	2	2	2	2	4	4	4	4	4	4	3	1	4	4	4	4
140					4							4	4	4	5	5
141					5	5	3	4	4	2	2	2	5	1	4	5
142					5	5	3	4	4	2	2	2	5	2	4	5
143	4	4	4	4									3	3	3	3
144	4	4	2	3	3	3	3	2	3	2	2	2	2	3	2	5
145	4	4	3	5	4	5	5	4	4	4	5	3	4	4	5	4
146																
147																
148																
149																
150																
151																
152																
153	4	2	2	1	5	5	5	4	4	5	5	3				
154																
155																
156																
157																
158																
159																
160	4	1	1	4	5	5	4	5	4	4	4	1	5	4	4	5
161																
162																
163	4	1	4	1									4	3	4	4
164																
165					4	4	3	4	4	3	4	2	5	4	5	4
166																
167	5	5	4	4	4	4	4	4	4	2	1	1	2	4	4	4
168																
169																
170																
171																
172																
173													4	3	5	5
174																
175	5	3	2	4	3	4	4	4	5	3	2	1	3	3	3	4
176																
177					4	2	4	4	4	4	4	2	4	2	4	4
178	4	2	2	2	3	3	3	3	4	3	3	4	3	5	5	5
179	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4
180	5	5	5	5	5	5	5	5	5	5	1	2	5	2	5	5
181					4	4	4	4		3	3	2				
182	5	5	0	5	5	5	5	5	5	5	5	2	5	3	3	3
183	4															
184																
185	5	5	1	1	5	5	5	5	5	5	5	1	2	4	4	5
186	3	3	4	4	3	4	4	4	4	4	4	3				
187																
188																
189																
190					4	4	4	4	4	4	3	2	4	4	4	5
191	4	4	2	4	3	3	4	4	4	3	2	2	3	4	3	4
192	4	4	4	4	5	5	5	5	5	5	1	1	5	5	5	5
193													0			
194	3	3	0	3	4	4	3	3	3	4	3	0	2	2	2	5
195																
196																
197																
198																
199	4	3	3	4	4	4	4	3	3	3	3	4	5	4	4	5
200	5	5	5	5	4	4	4	4	4	4	4	2	5	1	5	5
201	5	5	5	5	4	4	4	4	4	4	4	2	5	1	5	5
202	3	3	2	4	3	4	4	4	4	4	4	2	5	3	3	4
203						5	5	5	5	5	2		4	4	5	
204	4	4	4	4	2	3	3	3	3	3	2	3	4	3	0	4
205	3	4	4	4	4	4	3	4	4	4	4	4	3	3	3	5
206	4	4	4	4	4	4	3	4	4	3	3	4	3	3	4	3
207	5	5	4	4		5							5	3	4	5

Table G.1. Continues

NO	V42C5	V42C6	V42C7	V42C8	V42C9	V42C10	V42C11	V42C12	V43 1	V43 2	V43 3	V43 4	V43 5	V43 6	V43 7	V43 8	V43 9	V43 10	V43 11
1																			
2									1										
3	4	5	3	3	4	4	4	1	5	5	5	5	1	1	1	1	1	5	
4	4	3	4	4	4	3	3	2	2	4	4	4	4	4					
5	4	1	5	3	4	4	4	1			5	5							
6	5	5	3	3	4	4	4	2	1	5	5	5	4	4	4	4	5	4	
7	5	3	4	4	4	4			1	5	5	5	1	1	1	1	5		1
8	5	3	5	5	5	5	5		4	5	5	5	4		5	4	5	5	5
9						5			3	4	4	4		4					5
10	2	3	5	5	5	3	2	1	4	4	5	5	3	4	1	1	1	3	4
11	4	4	4	4	4	4	4	2	3	4	5	5	4	5	4	4	5	5	4
12	5			5		5			2	4	4	4	4	4	2	2	4	4	5
13	3	3	4	4	3	4	3	1	3	4	4	4	4	4	4	3	3	5	5
14	3	2	4	3	3	2	2	1	1	2	4	3	2	3	1	1	1	4	4
15	4		4	4	4	4	3		4	4	4	4	4	4	4	4	4	4	4
16	4	2	4	4	4	4	3	2	4	5	4	4	5	4	2	2	2	4	5
17																			
18	1	1	3	3	3		3	1	1	3	3	3	2	2	1	2	2	4	1
19	3	2	3	4	4	5	2	3	4	5	5	5	5	5	4	3	5	5	5
20	3	2	1	2	2	3	2	1	2	2	2	4		1	1	3	5	4	3
21	4	5	4	4	4	5	5	2	3	4	4	4	4	4	3	3	4	5	3
22										5	5	5	5	5			5	5	5
23	5	1	5	4	5	4	3	2	5	4	3	2	3	2	1	3	5	4	5
24																			
25																			
26																			
27																			
28	2	2	3	5	4	4	3	2	2	5	5	5	5	5	4	4	4	4	5
29	3	2	5	5	5	3	2	2	3	4	5	5	5	3	4	2	4	4	4
30	4	4	4	4	4	4	4	2	5	5	5	5	4	4	3	4	5	5	4
31	3	2	2	2	2	2	2		3	3	3	3	3	3	3	3	3	3	5
32			5	5	5		5	2	1	1		1		1		1		1	
33	2	3	4	4	4	4	4	2	4	4	4	4	4	4	4	4	4	4	4
34					4						3	3		5					
35	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	4
36	5	4	4	4	4	4	4	1	4	5	5	5	5	5	4	4	5	5	4
37									4	4	4	5	3	2	2	3	4		5
38	4	3	5	5	5	5	3	2	2	5	5	5	2	4	4	4	4	5	5
39																			
40									1	4	4	5	3	5	3	4	4	4	5
41	3	4	3	3	3	4	3	1	4	4	5	4	5	4	4	4	5	5	1
42	3	5	3	4	2	5	2	2	5	5	5	5	5	4	4	4	4	5	
43			5	5		5		2	3	4	5	5		5	4				
44	2	3	3	5	3	3	3	2	3	4	4	4	4	3	2	3	4	4	4
45																			
46	3	3	3	4	4	4	3	1	2	4	4	4	4	3	3	3	3	4	4
47																			
48	2	1	2	2	2	2	3	2	4	4	5	4	4	4	5	5	5	5	4
49	3	0	3	3	3	3				4	5	4		4				4	4
50																			
51	2	2	2	2	2	2	2	2											
52	4	2	3	4	4	5	2		2	4	4	4	2	2	2	2	4	4	2
53	3	2	3	4	3	3	4	1	1	5	5	5	5	3	1	1	5	5	1
54	5	5	5	5	5	5	5	2	4	5	5	5	4	4	2	2	2	4	5
55	3	2	5	4	4	4	3	4	2	5	5	5	4	3	3	3	3	3	4
56		3			4	4	4			4	4	4	4	4	4	4	4	4	2
57	2	3	1	3	3	4	3	1	1	4	5	5		4	1	4	4	4	5
58	5	4	5	5	5	5	5	2	5	5	5	5	5	5	5	5	5	5	5
59	4	3	3	4	3	2	3		3	4	4	5	4	4		3	3	5	4
60	4	1	1	1	1	1	1			4	5	5	2	5	4	4	4	4	5
61																			
62	4	2	3	3	2	3	4	2	3	5	5	4	4	4	1	1	2	4	5
63	4	4	4	4	4	4	4	2	5	5	5	5	5	3	1	1		5	0
64	2	2	2	3	3	2	2	4	1	1	1	5	1	1	1	1	1	1	5
65	5	5	5	5	1	5	3	5	2	5	5	5	3	5	4	4	3	5	5
66	4	3	4	4	4	4	4		4	4	4	4	4	2	2	4	4	5	4
67									3	4	5	5	5	5	4	4	5	5	4
68	2	2	3	3		2	2	4	4	4	4	4	4		4	4	5	5	4
69	3	3	3	3	3	3	3	3	1	4	4	4	3	3	2	2	4	4	1
70	3	3	3	3	3	3	3	1		5	5	5	5	5	5		5	5	5
71	5	4	4	4	4	4	4		3	5	5	5	4	5	4	4	4	4	3
72	4	4	5	5	5	5	5		5	5	5	5	4		3	4	5	5	5
73	5	5	1	1	1	5	1		4	4	4	5	4	4	5	4	4	4	2
74								3	4	4	5	3	3	3		4	5	5	0
75	5	4	5	5	5	4	4	2	4	4	5	5	5	4	4	4	4	5	3
76										4	4	4	4					4	
77																			
78	3	3	3	4	3	2	3	3	5	5	5	5	5	5	5	5	5	5	5
79	4	3	3	4	3	3	4		3	4	4	5	3	3	3	3	3	3	4
80	2	1	4	4	4	3	3		1	5	5	5	4	5	5	1	5	5	5
81	2	1	4	4	4	3	3		1	5	5	5	4	5	5	1	5	5	5
82	2	1	4	4	4	3	3		1	5	5	5	4	5	5	1	5	5	5
83	2	1	4	4	4	3	3		1	5	5	5	4	5	5	1	5	5	5
84				4	4	5			3	4	4	4	4	4	4	4	4	4	4
85	3	3	3	3	3	3	3	3	3	4	4	4	3	3	3	3	3	4	4
86	2	2	3	3	3	4	4	3	4	5	5	5	5	4	4	4	4	4	4
87								1	1	1	1	1	1	1	1		1	1	
88	4	4	4	4	4	4	4	2	1	5	5	5	5	5	5	5	5	5	4
89									3										
90																			
91	5	4	5	5	5	4	3		1	5	5	5	2	4	2	3	5	5	5
92	2	1	2	5	1	4	4	4	3	5	5	5	5	4	5	5	5	5	5
93	4	4	4	4	4	4	4	2	4	4	5	5	4	4	4	4	4	4	4
94	4	4	4	4	4	4	4	2	2	4	4	5	4	5	5	4	5	5	4
95																			
96	5	5	5	5	5	5	4	1	4	5	5	5	5	5	4	4	5	5	5
97	4	3	3	4	4	4	4	1	1	5	5	5	5	5	5	5	5	5	5
98	4	2	3	5	3	0	2	1	4	4	4	4	4	4	1	2	2	4	4
99	2	2	2	3	2	4	3	4	2	4	4	4	4	4	4	4	4	4	4
100				2	2				1	4	4	1	1	1	1	1	1	4	
101	3	2	2	4	4	3	4				4	4	3	3	2	3	3	4	4
102										4	4	4		2		3	4	4	4

Table G.1. Continues

NO	V42C5	V42C6	V42C7	V42C8	V42C9	V42C10	V42C11	V42C12	V43_1	V43_2	V43_3	V43_4	V43_5	V43_6	V43_7	V43_8	V43_9	V43_10	V43_11
103	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
104	2	2	0	4	3	4	2	2	5	5	5	5	5	5	1	5	5		5
105																			
106	4	4	3	3	3	3	4	2		4	4	4	2	4	2	2	4	4	4
107																			
108	4		4	4	4	4	4		4	4	5	5	4	0	4	4	5	5	3
109			4	4	4	4				4								4	
110									2	5	2	2	2	2	2	2	2	2	2
111	3	3	3	4	4	4	3	3	4	5	5	5	5	5	3	3	3	3	4
112	4	3	3	4	3	4	3		1	4	4	4	4	4	3	1	4	4	4
113	4	4	3	4	4	3	3		3	3	5	5	3	5	2	4	4	4	5
114	2	2	4	4	3	3	3					5		5					
115										4	4	4	4	4	4	3	4	4	3
116									4	4	4	4	4	4	4	4	4	4	4
117	4	2	0	5	4	5	3		3	5	5	5	5		2	3	4	4	4
118									3	5	5	5	5	5	3	3	5	5	5
119	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
120	3	1	4	4	4	4	4		2	2	4	4	4	4	4	4	4	4	4
121	0	2	3	3	4	5	4		2	5	5	5	5	5	1	1	5	5	5
122	4	3	4	4	3	4	3	2	1	5	5	5	5	3	3	3	5	5	5
123	4	4	4	5	4	5	4		4	5	5	5	4	4	3	2	5	5	5
124	4	2	3	4	4	4	4		3	4	5	5	3	4					
125	0	4	4	3	4	4	4		2	2	2	2	2	2	2	2	2	2	2
126	4	4	4	5	3	4	3		5	5	5	5	5	5	5	5	5	5	5
127	5	2	4	3	3	5	4		2	5	5	5	4	5	2	3	3	3	4
128	1	1	1	1	1	1	1	5											
129	5	2	2	4	4	4	3		2	4	5	5	3	4	1	3	4	4	3
130	2	1	2	2	2	2	1	5	4	4	5	5	3	3	3	4	4	4	4
131	3	2	3	4	4	4	4		4	4	5	5	3	4	1	4	3	3	4
132	2	2	2	2	3	2	2	4	5	5	5	5	5	5	3	3	5	5	3
133	3		4	4					4	5	4	4	3	4			4	5	
134	5	1	4	4	4	4	4		5	5	5	5	5	5	5	5	5	5	1
135																			
136			5							5	5	5	5	5	3	1	5		3
137										5	5	5	5		5		5	5	
138																			
139	4	3	3	4	4	4	4	1	4	4	4	4	4	4	4	4	4	4	4
140	3	3	4	4	3	0	2		1	4	5			4	2				5
141	5	5		5	1	1	3		4	4	4	4	4	4	4	4	4	4	
142	5	5		5	1	1	1		4	4	4	4	4	4	4	4	4	4	4
143	3	3	3	2	1		3		2	5	5	5	5	5	5	4	5	5	5
144	5	2	3	3	3	5	2	4	4	4	5	5	3	4	2	3	4	4	4
145	4	4	4	4	4	3	3		4	4	4	3	5	3	2	2	5	5	5
146																			
147																			
148																			
149																			
150																			
151																			
152																			
153																			
154																			
155																			
156																			
157																			
158																			
159																			
160	5	5	5	5	5	5	5		5	5	5	5	4	4	2	4	2	2	5
161																			
162																			
163	4	4	3	2	3	0	2		4	4	4	3	1	0	1	1	3	4	4
164																			
165	4	4	5	5	4	5	3		3	4	5	3	4	2	2	2	2		5
166																			
167	1	2	3	4	5	4	3		3	4	5	5	4	5	4	4	3	3	2
168																			
169																			
170																			
171																			
172																			
173	4	4	4		3	3	3		3	5	5		5	5	3	3	4	4	4
174																			
175	4	2	2	4		4	4	1	3	5	5	5	4	5	1	4	3	5	4
176																			
177	4	3	4	4	3	4	4	4	2	4	4	4		3	2	2	4	4	3
178	5	5	3	5	3	5	4		4	4	4	4	2	4	2	2	2	4	4
179	4	4	4	4	4	4	4	2		5	5	5	2	4	1	1	1	1	1
180	5	4	4	4	4	4	4	2		5	5	5	5	5	4	4	4	4	5
181									4	5	5	5	4	4	4	4	4	4	5
182	3	3	3	3	3	3	3	3	4	4	4	4	4	4	1	1	5	5	5
183									4	4	4	4	4	4	4	0	4	4	4
184																			
185	5	2	5	4	4	5	5		3	4	5	5	5	4	3	2	3		4
186									4	5	5	5	5	5	3	3	5	5	5
187																			5
188																			
189																			
190	4	4	3	5	4	4	3		4	4	4	4	4	4	4	4	4	4	2
191	2	2	3	4	3	2	2	4	2	3	4	4	3	4	2	2	3	3	4
192	5	5	5	5	4	5	4		4	4	4	5	4	4	3	2	3	4	5
193																			
194	5	5	0	5	5					4	4	4	4	4					
195																			
196																			
197																			
198																			
199	4	3	3	3	3	4	4		3	4	5	5	5	4	3	3	4	4	5
200	2	2	3	3	3	3	3		2	4	4	4	4	4	1	1	1	4	2
201	2	2	3	3	3	3	3		2	4	4	4	4	4	1	1	1	4	2
202	5	2	3	4	2	3	2		3	4	5	5	4	4	4	4	4	4	4
203																			
204	2	2	3	3	3	3	3	3	2	4	4	4	3	4	3	3	3	4	4
205	5	3	3	5	3	5	3		2	2	2	4	4	4	4	3	4	5	1
206	1	1	3	3	3	3	1	4	5	5	5	5	4	4	3	4	4	5	0
207	5	3	3	5	3	5	4			2	4	4	4					4	4

Table G.1. Continues

NO	V44	V45_1	V45_2	V45_3	V45_4	V45_5	V45_6	V45_7	V45_8	V45_9	V45_10	V45_11	V45_12	V45_13	V45_14	V45_15	V45_16	V45_17	V46
1																			
2	5	1	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
3	2	1	2	2	1	2	2	2	2	2	2	2	1	1	2	2	2	2	1
4	2	1	2	2	2	2	2	1	2	2	1	2	2	2	2	2	2	2	2
5	2	2	2	2	2	2	1	2	2	2	2	1	2	2	2	2	1	1	2
6	3	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2
7	3	1	1	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2
8	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	1
9	5	1	2	2	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2
10	3	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	
11	5	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	5	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1
13	5	1	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	1
14	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	1	2	2	2
15	5	1	2	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2
16	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
17																			
18	5	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	1	2	1
19	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	1
20	5	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2
21	5																		1
22	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
23	4	1	2	1	1	2	2	2	2	2	2	1	2	2	2	2	1	2	
24	1	1	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2	2	1
25	4	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	1	1
26																			
27																			
28	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
29	3	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
30	5	2	2	2	2	2	2	2	1	2	2	1	2	2	2	1	2	2	2
31	1	1	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	2
32	5	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
33	5	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
34		1	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2
35	1	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2
36	2	1	2	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	1
37	5	1	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2
38	0	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
39																			
40	2	1	2	2	2	2	1	2	2	2	1	2	2	2	2	2	2	2	
41	2																		2
42	2																		2
43	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	
44	2	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
45	4	1	2	2	1	2	2	2	2	2	2	2	1	2	2	2	2	2	
46	2	1	2	2	2	2	2	2	1	2	2	1	2	2	2	2	2	2	2
47	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
48	5	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
49	5	1	2	2	1	2	2	1	2	2	2	2	2	2	2	2	2	2	1
50	5	1	2	2	2	2	2	1	1	2	2	2	2	2	2	1	2	2	1
51																			
52	5	1	2	2	2	2	2	2	1	2	2	2	2	2	1	2	2	2	1
53	2	1	2	2	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2
54		1	2	1	2	2	2	2	1	2	2	2	2	2	2	1	2	2	1
55	5	1	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2
56	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
57	5																		1
58	5	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2
59	2	1	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2
60	2	1	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	1
61		1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2	
62		1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1
63	5	1	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	1
64		1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	
65	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
66	5	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1
67	5	1	2	2	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2
68	5	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	
69	2	1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2	2
70	4	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	
71	2	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1
72	1	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
73	5																		2
74	2	1	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	
75	4	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	1
76		1	1	1	1	2	1	2	1	2	2	1	1	2	1	1	2	1	1
77																			
78	4	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
79	3	1	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2
80	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
81	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
82	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
83	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
84	5																		
85	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	
86	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
87	5	1	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	1
88	5	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
89	5	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	1
90																			
91	5	1	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	2
92	5	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	1
93	0	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	0
94	2	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
95																			2
96	5	2	2	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	1
97	5	1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2	1
98	2	1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2	2
99		1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
100	2	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
101	5	2	2	2	1	2	1	2	2	2	2	1	2	2	2	2	2	2	2
102	5	2	2	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2

Table G.1. Continues

NO	V44	V45_1	V45_2	V45_3	V45_4	V45_5	V45_6	V45_7	V45_8	V45_9	V45_10	V45_11	V45_12	V45_13	V45_14	V45_15	V45_16	V45_17	V46
103	5	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	1	2	2
104	2	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2
105	5	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
106	4	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2
107																			
108	1	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
109	1	2	2	2	2	2	2	1	2	2	2	1	2	2	1	2	2	2	2
110	0	1	2	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2
111	5	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
112	5	1	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	2
113	5	1	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2
114	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
115	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
116	5	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	
117	0	1	2	2	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2
118	1	1	2	2	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2
119	5	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	
120	2	1	2	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2
121	5	1	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	2	2
122	1	1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2	2
123	1	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	
124	3	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
125	2	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
126	1	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	
127	2	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1
128		1	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2
129	2	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
130	5	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2
131	5	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2
132	5	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1
133	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
134	5	1	2	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2	
135	0	1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2	2
136	5	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1
137	5	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	1
138																			
139	5	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2
140	1	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	1
141	1	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	
142	1	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	
143	2																		1
144	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
145	5	1	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2
146																			
147																			
148																			
149																			
150																			
151																			
152																			
153	2	1	2	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	
154																			
155																			
156																			
157																			
158																			
159																			
160	1	1	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	1
161																			
162																			
163	3	1	2	2	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2
164																			
165	5	1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2	2
166																			
167	5	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2
168																			
169																			
170																			
171																			
172																			
173	2	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
174																			
175	5	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
176																			
177	5	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
178	5	1	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2
179	5	1	2	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2	1
180	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2
181	4	1	2	1	1	2	2	2	1	2	2	2	1	2	1	1	2	2	1
182	5	1	2	2	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2
183		1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
184																			
185	5	1	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1
186	5	1	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	1
187	2	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1
188																			
189																			
190	0	1	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2
191	5	1	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2	2	1
192	5	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
193																			
194	5	1	2	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2
195																			
196	5	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
197		1	2	2	1	2	2	2	2	2	2	2	1	2	2	2	2	2	
198																			
199	1	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2
200	5	1	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1
201	5	1	1	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1
202	5	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
203																			
204		1	2	2	2	2	2	2	1	2	2	2	2	2	2	1	2	2	1
205	5	1	2	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2
206	2	1	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
207	2	1	2	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2

Table G.1. Continues

NO	V47_1_1	V47_1_2	V47_1_3	V47_1_4	V47_1_5	V47_1_6	V47_1_7	V47_1_8	V47_1_9	V47_2_1	V47_2_2	V47_2_3	V47_2_4	V47_2_5	V47_2_6	V47_2_7	V47_2_8
1																	
2										2	2	2	2	1	2	1	2
3										1	2	2	2	2	1	1	2
4	2	2	1	2	1	2	2	1	2	2	2	2	2	1	2	2	1
5	2	2	2	1	2	2	1	2	2	2	1	2	2	2	2	2	2
6	2	2	1	2	2	2	1	1	2								
7	2	2	1	2	2	2	1	1	2								
8	2	1	2	2	2	2	1	1	2	2	2	2	2	1	2	1	1
9	2	2	1	2	1	2	2	2	1	2	2	1	2	1	2	2	1
10	2	2	1	2	2	1	1	2	2								
11	2	2	1	2	1	2	2	1	2	2	2	1	2	1	2	2	1
12																	
13	2	2	1	2	2	1	2	2	1								
14	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2
15	2	2	1	2	1	2	2	2	1								
16	2	2	2	2	2	1	2	2	2	1	2	2	2	2	2	2	9
17										2	2	2	2	2	2	2	2
18	2	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	1
19	2	1	2	2	1	1	2	2	2	1	2	2	2	1	1	2	2
20	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2
21	2	2	1	2	2	2	1	1	2	2	2	1	2	2	2	1	1
22	1	2	2	2	2	2	2	1	1								
23	2	1	2	2	1	2	2	1	2	1	2	2	1	2	1	2	2
24	2	2	2	1	2	2	1	2	2	2	2	2	2	2	2	1	2
25	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1
26																	
27																	
28	2	2	2	2	1	1	2	2	1	2	2	2	1	2	1	2	1
29	2	2	2	2	1	2	2	1	2	2	2	1	2	2	2	2	2
30	2	2	1	2	1	2	2	1	2	2	2	2	2	2	1	2	1
31	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2
32	1	2	2	2	2	1	2	2	2								
33	1	1	2	2	2	2	2	1	2								
34	2	1	2	2	1	2	2	1	2								
35	1	1	2	2	2	2	2	1	2								
36	2	1	1	2	2	2	1	2	2	2	1	1	2	2	2	1	2
37	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	1	1
38	1	2	2	1	2	1	2	2	2	2	2	2	1	2	1	2	2
39																	
40	1	2	1	2	2	1	2	2	2	2	2	1	2	1	2	2	2
41	1	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	1
42	2	2	2	2	1	1	1	2	2	2	2	2	2	1	2	2	1
43	2	2	2	2	1	1	1	2	2	2	2	2	2	1	1	2	1
44	2	2	2	2	1	2	2	1	1	2	2	1	2	1	1	2	2
45	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	1	1
46																	
47	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	2
48	2	2	2	2	2	1	1	2	1	2	2	2	2	2	1	1	2
49	2	2	1	2	2	1	2	1	2	2	2	2	2	2	2	1	1
50																	
51																	
52																	
53	2	2	1	2	2	2	2	1	1	1	2	2	2	2	2	2	1
54																	
55	2	2	1	2	1	2	2	1	2	2	2	2	1	2	2	1	1
56	2	1	2	2	2	2	2	1	1	2	2	1	2	1	2	2	1
57	2	2	2	2	1	2	2	1	1	2	2	2	2	1	2	1	1
58	2	2	1	2	2	1	2	1	2	2	2	1	2	2	1	2	1
59	2	2	1	2	1	2	2	1	2	2	2	2	2	1	1	2	2
60	2	2	2	2	1	2	2	2	2	2	2	2	2	1	2	1	2
61																	
62	2	1	1	2	1	2	2	2	2	2	2	2	2	2	2	1	1
63	2	1	2	2	1	2	2	1	2	2	1	1	2	1	2	2	2
64	2	2	2	2	2	2	2	2	1								
65	2	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	1
66	2	2	1	2	1	2	2	1	2	2	2	1	2	2	2	2	2
67	2	2	2	2	2	1	1	1	2	2	2	2	2	1	2	2	1
68	1	1	2	2	2	2	2	1	2	2	1	1	2	2	2	2	2
69											0	0	0	0	0	0	0
70	2	2	2	1	2	2	1	2	1	1	1	2	2	1	2	2	2
71	2	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	1
72	2	2	2	2	2	1	2	1	1								
73																	
74																	
75	2	2	1	2	2	2	2	1	1	2	2	1	2	2	2	2	1
76	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	1	1
77																	
78	2	2	1	2	1	1	2	2	2	2	2	2	2	1	2	2	1
79	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	1	1
80	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
81	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
82	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
83	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
84	2	2	2	2	1	2	1	2	1	2	2	2	2	2	1	1	1
85	2	1	2	2	2	2	1	1	2	2	1	2	2	2	2	1	1
86	1	2	2	2	2	1	2	2	1	1	2	2	2	2	1	2	2
87	2	2	1	2	1	2	2	2	1								
88	1	2	1	2	2	1	2	2	2	1	2	1	2	2	1	2	2
89	2	2	1	2	1	2	1	2	2	2	2	1	2	1	2	2	1
90																	
91	1	2	2	2	2	2	2	1	1	2	2	2	2	2	1	2	1
92	2	2	2	2	1	1	2	2	1	2	2	2	1	1	2	2	2
93	2	2	2	2	2	2	1	1	1								
94	2	2	1	2	2	2	2	1	1	2	2	1	2	2	1	2	1
95																	
96	2	2	1	2	2	2	1	1	2	2	2	2	2	2	2	1	1
97	2	2	2	2	1	2	2	2	2	2	2	1	2	1	2	2	2
98	2	2	1	1	1	2	2	2	2	2	2	1	1	1	2	2	2
99	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
100																	
101	2	1	2	2	2	1	2	1	2	2	1	2	2	1	2	2	1
102	2	2	2	2	1	2	2	1	1	2	2	2	2	1	2	1	1

Table G.1. Continues

NO	V47_1_1	V47_1_2	V47_1_3	V47_1_4	V47_1_5	V47_1_6	V47_1_7	V47_1_8	V47_1_9	V47_2_1	V47_2_2	V47_2_3	V47_2_4	V47_2_5	V47_2_6	V47_2_7	V47_2_8
103	1	2	2	2	1	2	2	1	2	1	2	2	2	1	2	2	1
104	2	2	2	2	1	2	1	2	1								
105	2	2	1	2	1	2	1	2	2								
106	2	1	2	2	2	2	2	1	1	1	2	2	2	2	2	1	1
107																	
108	2	2	1	2	2	1	2	1	2	2	2	1	2	2	1	2	1
109																	
110	2	2	2	2	1	2	2	1	2	2	2	2	2	2	2	1	2
111	2	2	2	2	1	2	2	1	1	2	2	2	2	1	2	2	1
112	1	2	1	2	2	1	2	2	2								
113	2	2	2	2	1	2	2	1	1	2	2	2	2	1	2	2	1
114	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	1	1
115	2	2	2	2	2	1	2	1	2	2	2	2	1	2	1	2	2
116	2	2	2	2	1	1	1	1	2								
117	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	2	1
118	1	2	2	2	2	2	2	1	1	2	2	2	2	1	2	2	1
119	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
120	2	2	1	2	1	2	2	2	1								
121	2	1	2	2	1	2	2	1	2								
122	1	2	1	2	2	2	2	1	2	1	2	2	1	2	2	2	1
123	2	2	2	2	2	1	1	1	2	2	2	2	2	2	1	1	1
124	2	2	2	2	2	2	1	1	1	1	2	2	2	1	2	2	1
125																	
126	2	2	1	2	2	1	2	2	2	2	2	2	2	1	1	2	2
127	2	2	2	2	2	2	2	1	1	2	2	2	2	1	2	2	2
128																	
129	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1
130	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2
131	2	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	2
132	1	1	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1
133	2	2	2	1	2	2	1	2	1	2	2	2	2	2	2	2	2
134	2	1	2	2	2	1	1	2	2	1	1	2	2	2	2	2	1
135																	
136	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1
137	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	1	1
138																	
139	1	2	1	2	2	2	1	2	2	2	2	2	2	2	1	1	1
140																	
141																	
142																	
143	2	2	2	2	2	1	1	1	2	2	2	2	2	2	1	2	1
144	2	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	1
145	2	2	2	1	2	2	1	1	2								
146																	
147																	
148																	
149																	
150																	
151																	
152																	
153	2	2	1	2	2	2	1	2	1	2	2	2	1	1	2	2	2
154																	
155																	
156																	
157																	
158																	
159																	
160	2	2	1	2	1	2	2	1	2	2	2	2	2	1	2	1	2
161																	
162																	
163																	
164																	
165	1	2	2	2	1	2	2	1	2	1	2	2	2	1	2	2	1
166																	
167	2	2	1	2	2	1	2	1	2	2	2	1	2	2	1	2	1
168																	
169																	
170																	
171																	
172																	
173	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	1
174																	
175																	
176																	
177	2	2	1	2	1	2	2	1	2								
178	2	2	2	2	2	2	1	1	1	2	2	2	2	1	1	2	1
179	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	1	1
180	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	1	1
181	2	2	2	2	2	2	1	1	1								
182	2	2	1	2	1	2	2	2	1								
183																	
184																	
185	2	2	2	2	1	2	2	1	1	2	2	2	2	1	2	2	1
186	2	1	1	2	2	2	1	2	2	2	2	2	2	1	2	1	1
187	2	2	1	2	2	1	2	2	2	2	2	2	2	1	2	2	2
188																	
189																	
190	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	1	1
191	1	2	1	2	2	1	2	2	2	2	2	2	2	2	2	1	1
192	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2	2
193																	
194	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	1
195																	
196	2	2	1	2	2	2	2	2	2								
197																	
198																	
199	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1	2	2
200	2	2	2	2	2	2	1	1	1								
201	2	2	2	2	2	2	1	1	1								
202	2	2	2	2	2	1	2	1	1	2	2	2	2	1	1	2	1
203																	
204	2	2	2	2	2	1	2	1	1	2	2	2	2	1	1	1	2
205	2	2	1	2	1	1	2	2	2	2	2	1	2	1	1	2	2
206	2	2	2	2	1	2	1	1	2	2	2	2	2	1	2	1	1
207	2	2	1	2	2	2	2	1	1	2	2	1	2	2	2	2	1

Table G.1. Continues

NO	V47_2_0	V48_1	V48_2	V48_3	V48_4	V48_5	V48_6	V48_7	V48_8	V48_9	V48_10	V49_1	V49_2	V49_3	V49_4	V49_5	V49_6	V49_7	V50_1_1	V50_1_2
1																				
2	1	1	2	1	2	2	1	2	2	2	2	5							5	5
3	2	1	2	1	1	2	2	2	2	2	2	5	2	4	2	4	4	4	5	5
4	1	1	1	2	2	2	2	2	2	1	2	2	4	1	1	2	3	3	4	4
5	2	1	1	2	2	2	2	2	1	2	2	1	5	2	2	2	2	5	5	5
6		1	1	1	2	2	2	2	2	2	2	5	2	5	2	5	5	5	5	5
7		1	1	1	2	2	2	2	2	2	2	5	2	5	2	5	5	5	5	5
8	2	1	1	2	2	2	2	1	2	2	2	4	5	4	3	4	3	4	5	5
9	2	1	2	2	1	2	2	2	2	1	2	2	2	2	2	3	3	2	4	5
10		1	1	1	2	2	2	2	2	1	2	4	4	3	4		3	3	5	5
11	2	2	1	1	1	2	2	2	2	2	2	3	4	4	4	3	3	3	4	4
12		1	1	2	2	2	2	2	2	1	2	2	4	4	4	4	2	4	5	5
13		1	2	2	2	2	2	2	1	2	2	2	5	2	3	3	3	3	5	5
14	2	2	1	1	2	2	2	2	2	1	2	2	1	2	2	3	2	3	3	3
15		1	2	1	2	2	1	2	2	2	2	4	3	3	2	3	3	1	4	4
16	2																			
17	1	2	2	1	2	2	2	2	1	2	1	4	3	4	2	2	5	4	4	5
18	2	2	2	2	2	2	2	1	2	2	2	2	4	2	2	4	2	4	4	5
19	2	1	2	1	2	2	2	2	2	1	2	5	2	4	2	2	5	4	5	4
20	2	1	1	2	2	2	2	2	2	1	2	2	4	4	3	4	2	4	4	4
21	2																		5	5
22		1	1	2	2	2	2	2	2	1	2	5		5	2	1	5	2	5	5
23	2	2	2	2	2	2	2	1	1	2	1	4	3	1	3	2	4	3	3	4
24	2	1	2	1	1	2	2	2	2	2	2	5	4	2	3	3	3	5	4	4
25	2	1	2	2	2	2	2	2	2	2	2									
26																				
27																				
28	2	1	1	2	2	2	2	2	2	1	2	5	3	5	4	5	3	3	2	4
29	2	1	1	2	2	2	2	2	2	1	2	2	3	2	2	3	3	2	5	5
30	2	1	2	1	1	2	2	2	2	2	2	2	5	1	2	2	1	5	5	5
31	1	1	2	2	1	2	2	2	2	1	2	5	1	1	1	1	5	5	5	5
32		1	1	2	2	2	2	2	2	2	2	5	1	1	1	1	1	5	5	5
33		1	1	1	2	2	2	2	2	2	2	2	4	4	2	4	3	4	4	5
34		1	2	1	2	2	2	2	2	1	2	5	4	3	3	3	0	4	5	5
35		1	1	1	2	2	2	2	2	2	2	3	4	3	3	3	3	3	4	4
36	2	1	1	1	2	2	2	2	2	2	2	4	2	5	1	5	5	5	5	5
37	2	1	2	1	1	2	2	2	2	2	2	5	5	4	2	3	2	4	5	5
38	2	1	1	2	2	2	2	2	2	1	2	2	4	4	4	5	3	4	4	2
39																				
40	1	1	2	1	2	2	2	2	2	1	2	5	4	4	2	2	4	5	4	4
41	1	1	1	2	2	2	2	2	1	2	2	0	0						5	4
42	1																		5	5
43	2	1	1	1	2	2	2	2	2	1	2	5	2	4	3	4	4	4	4	5
44	2	1	2	2	2	2	2	1	2	1	2	4	3	4	3	4	3	4	4	3
45	1	2	1	1	2	2	1	2	2	2	2	1	4	4	1	4	1	1	4	4
46		1	1	2	2	2	2	2	2	1	2	4	3	4	2	4	4	4	4	4
47	1	2	1	2	1	2	2	2	2	1	2	3	4	4	2	2	3	3	4	5
48	1	1	1	1	2	2	2	2	2	2	2	5	3	3	2	4	2	4	4	4
49	1	1	1	2	2	2	2	2	2	2	2	4	3	3	4	3	2	0	4	4
50												4	4	3	4	3	3	4	4	4
51		1	1	1	2	2	2	2	2	2	2	5	4	3	4	3	4	0	5	4
52		1	1	1	2	2	2	2	2	2	2	5	5	5	1	1	5	5	5	5
53	1	1	1	2	2	2	1	2	2	2	2	4	4	4	3	3	3	4	4	4
54		1	1	1	2	2	2	2	2	2	2	1	5	1	5	1	5	5	5	5
55	2	1	2	1	1	2	2	2	2	2	2	2	1	5	3	3	3	5	5	4
56	2	1	2	2	2	2	1	2	2	1	2	4	3	4	3	4	4	5	5	5
57	2																		2	5
58	2	1	1	2	2	2	2	2	2	1	2	5	3	3	1	5	5	5	5	1
59	1	1	1	2	2	2	2	2	2	1	2	3	4	3	4	3	2	4	4	5
60	2	1	1	2	2	2	2	2	2	1	2	5	4	4	2	4	5	4	5	5
61		1	1	1	1	2	1	1	1	1	2	1	5							
62	2	1	1	1	2	2	2	2	2	2	2	5	2	5	3	4	3	5	4	3
63	2	1	2	2	2	2	2	1	2	1	2	5	2	2	1	1	5	5	5	5
64		2	2	2	2	2	2	2	2	1	2	5	1	1	1	1	5	5	5	5
65	1	1	1	2	2	2	2	2	2	1	2	1	4	4	2	4	3	4	4	3
66	2	2	1	2	2	2	1	2	2	1	2	2	4	3	4	4	3	4	5	4
67	1	1	2	2	2	2	2	1	2	1	2	5	1	1	1	1	5	1	4	5
68	1	1	2	2	2	2	2	1	1	2	2	3	3	5	1	1	5	3	5	5
69	0	2	2	2	1	2	1	1	2	2	2	2	5	4	2	3	3	3	4	4
70	2	1	1	2	1	2	2	2	2	2	2	2	5	2	5	1	1	5	5	5
71	1	2	1	1	2	2	2	2	2	1	2	5	5	3	3	3	3	3	5	5
72		1	1	2	2	2	2	2	2	1	2	2	4	4	5	5	5	4	4	5
73																	0	0	5	4
74												2	4	4	4	4	2	4	4	5
75	1	1	1	2	2	2	2	2	2	1	2	1	5	1	1	1	5	5	5	5
76	2												5						5	5
77																				
78	1	1	1	2	2	2	2	2	2	1	2	4	5	3	2	4	1	5	5	5
79	1	1	2	1	2	2	2	2	2	1	2	2	4	4	3	4	3	4	4	3
80	1	2	2	2	2	2	2	2	2	1	2	5	1	1	1	1	1	4	5	5
81	1	2	2	2	2	2	2	2	2	1	2	5	1	1	1	1	1	4	5	5
82	1	2	2	2	2	2	2	2	2	1	2	5	1	1	1	1	1	4	5	5
83	1	2	2	2	2	2	2	2	2	1	2	5	1	1	1	1	1	4	5	5
84	2																0	0	5	5
85	2	1	1	1	2	2	2	2	2	2	2	4	3	3	2	2	4	3	4	4
86	1	1	2	2	2	2	2	2	1	2	1	4	2	2	2	2	4	4	4	4
87		2	2	2	2	2	1	2	1	1	2	0	5	4	3	3	3	4	5	
88	2	1	1	2	2	2	2	2	2	1	2	1	5	4	5	1	1	5	5	5
89	2	1	2	1	2	2	2	2	2	1	2	4	4	3	3	3	4	4	5	4
90																				
91	1	1	1	2	2	2	2	2	2	1	2	3	3	3	3	3	5	1	3	2
92	1	1	2	2	2	2	2	2	1	1	2	1	5	4	4	4	2	4	5	4
93		1	1	1	2	2	2	2	2	2	2	5	4	2	3	4	4	4	5	4
94	2	1	1	2	2	2	2	2	2	1	2	1	1	3	1	3	3	3	4	5
95		2	1	2	2	2	1	2	2	1	2								5	5
96	1	1	1	1	2	2	2	2	2	2	2	5	1	5	1	5	5	4	5	5
97	1	1	1	1	2	2	2	2	2	2	2	1	5	5	1	5	5	5	5	5
98	2	1	2	2	2	2	1	2	2	1	2	2	4	3	4	3	2	3	4	4
99	2	1	1	1	2	2	2	2	2	2	2	4	4	4	2	2	4	2	4	4
100		1	2	1	2	2	2	2	1	2	2	2	4	4	2	4	4	4	4	4
101	2	1	1	2	2	2	1	2	2	2	2	3	2	4	4	3	5	2		
102	2	1	2	1	2	2	2	2	2	2	2	2	4		4	4		4	5	4

Table G.1. Continues

NO	V47_2_9	V48_1	V48_2	V48_3	V48_4	V48_5	V48_6	V48_7	V48_8	V48_9	V48_10	V49_1	V49_2	V49_3	V49_4	V49_5	V49_6	V49_7	V50_1_1	V50_1_2
103	2	1	1	2	2	2	2	2	2	1	2	3	3	3	3	3	3	3	1	1
104		1	2	2	2	2	2	1	2	1	2	5	5	1	1	1	1	5	5	5
105																			5	5
106	2	1	1	2	2	2	2	2	2	1	2	1	5	1	5	3	1	5	5	5
107																				
108	2	1	2	1	2	2	2	2	1	2	2	4	4	4	4	4	4	4	5	5
109		2	2	2	2	2	2	1	2	2	2	4	4							
110	2											2	5							
111	1	1	1	1	2	2	2	2	2	2	2	3	4	3	5	3	3	4	5	5
112		1	1	1	2	2	2	2	2	2	2	4	3	4	3	3	3	4	4	4
113	1	1	1	2	2	2	2	2	2	1	2	4	3	4	2		3	4	4	4
114	2	1	2	1	2	2	2	2	2	1	2	1	5	1	1	5	5	5	5	1
115	2	1	1	2	2	2	2	2	2	2	2	0	4	4	3	4		4	4	5
116		1	1	1	2	2	2	2	2	2	2	0	5			5	5		5	5
117	1	2	1	1	2	2	2	2	2	1	2	2	4	3	3	3	3	4	5	5
118	1	1	1	2	2	2	2	2	2	1	2	3	4	3	3	3	3	4	4	4
119	2	1	1	1	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4	
120		1	1	2	2	2	2	2	2	1	2	2	4	2	4	2	4	4	4	4
121		1	1	2	2	2	2	2	2	1	2	1	5	2	4	3	2	5	5	5
122	2	2	1	1	2	2	1	2	2	2	2	1	5	5	5	1	1	5	5	5
123	2	1	1	2	2	2	2	1	2	2	2	5	5	5	1	1	1	1	5	5
124	2	1	2	1	2	2	2	2	2	1	2	2	2	4	4		4	5	4	4
125		1	1	1	2	2	2	2	2	2	2	3	4	3	4	3	3	4	4	4
126	2	1	1	1	2	2	2	2	2	1	2	5	4	4	2	4	4	4		
127	2	1	1	2	2	2	2	2	2	1	2	3	2	4	1	2	5	3	2	3
128		1	1	2	1	2	2	2	2	2	2	1	5	1	1	1	1	5	5	5
129	2	1	1	2	2	2	2	1	2	2	2	3	5	2	4	3	2	3	4	5
130	1	1	1	2	2	2	2	2	2	1	2	2	5	2	2	5	2	5	5	5
131	1	1	1	2	2	2	2	2	2	1	2	1	5	2	5	2	3	4	5	5
132	1	1	1	2	2	2	2	2	2	1	2	5	1	1	1	1	5	1	5	5
133	2	1	1	2	2	2	2	2	2	1	2	2	5	2	5	3	3	5	5	3
134	2	1	1	1	2	2	1	1	1	1	2	5	1	5	1	1	1	5	5	5
135		1	2	2	2	2	1	2	2	1	2								5	5
136	2	1	1	2	2	2	2	2	2	1	2	5	1		1	1		1	5	5
137	1	1	1	2	2	2	2	2	2	1	2	4	4		2	4		4	5	5
138																				
139	2	1	2	2	1	2	2	2	2	1	2	3	3	3	3	3	3	3	4	4
140		1	2	2	2	2	2	2	2	1	2	4	4	5	4	5		4	4	4
141		2	1	2	2	2	2	2	2	2	2		5						2	2
142		2	1	2	2	2	2	2	2	2	2		5						2	2
143	1																		5	5
144	1	1	1	2	2	2	2	2	2	1	2	3	3	4	3	4	3	4	4	4
145		1	1	1	2	2	2	2	2	2	2	4	5	3	4	4	3	3	4	4
146																				
147																				
148																				
149																				
150																				
151																				
152																				
153	1	2	1	2	2	2	1	2	2	1	2	5	5	2	5	2	1	5	5	1
154																				
155																				
156																				
157																				
158																				
159																				
160	1	1	2	1	2	2	2	2	2	1	2	2	4	2	4	4	2	4	5	2
161																				
162																				
163		2	1	1	2	2	1	2	2	2	2	4	4	3	2	3	3	0	4	4
164																				
165	2	1	2	1	2	2	2	2	2	1	2	5	3	3	3	3	3	4	4	4
166																				
167	2	1	1	2	2	2	1	2	2	2	2	3	5	3	3	3	3	3	5	5
168																				
169																				
170																				
171																				
172					0	0	0	0	0	0	0	0	0							
173	2	1	1	2	2	2	2	2	2	1	2	5	5	2	4	3	4	5	5	5
174																				
175		1	2	1	2	2	2	2	2	1	2	4	5	3	4	3	4	5	5	5
176																				
177		1	2	1	2	2	2	2	2	1	2	5	3	4	2	3	2	2	4	4
178	1	1	2	2	2	2	2	2	2	2	2	5	2	4	1	2	5	5	5	5
179	1	1	1	1	2	2	2	2	2	2	2	3	3	3	4	4	4	4	4	4
180	2	1	1	2	2	2	2	2	2	1	2	5	5	4	4	4	4	5	5	0
181		1	1	1	1	2	2	2	2	1	2	4	4	4	4	4	3	4	4	4
182		1	2	1	2	2	2	2	2	1	2	5	4	4	1	4	4	5	5	5
183		1	1	2	2	2	2	2	2	2	2	0	4	0	4					
184																				
185	1	1	2	1	2	2	2	2	2	1	2	5	4	3	3	3	3	3	5	5
186	2	2	1	1	2	2	2	2	2	1	2	4	4	2	4	3	3	4	4	4
187	2	1	2	2	2	2	2	2	2	1	1	5	2	4	2	2	2	2	5	5
188																				
189																			4	5
190	2	1	2	1	2	2	2	2	2	1	2	5	4	4	4	4	3	4	4	5
191	1	1	1	2	2	2	2	2	2	1	2	2	4	3	2	2	2	4	4	4
192	2	1	2	1	2	2	2	2	2	1	2	1	5	1	2	2	2	2	5	5
193																				
194	2	1	1	2	2	2	2	2	2	1	2	4	1	4	1	4			4	4
195																				
196		2	1	1	2	2	2	2	2	2	2	5								
197																				
198																				
199	1	2	1	2	2	2	2	1	2	1	2	5	4	2	4	2	2	4	4	4
200		1	1	1	2	2	2	2	2	1	2	1	5	1	5	5	3	5	4	4
201		1	1	1	2	2	2	2	2	1	2	2	4	1	5	5	3	5	4	4
202	2	1	1	1	2	2	1	2	2	1	1	4	4	2	4	3	2	4	4	4
203																				
204	2	1	1	1	2	2	2	2	2	2	2	2	4	2	4	2	2	4	5	5
205	2	1	2	2	2	2	2	1	2	1	2	3	3	4	3	4	3	4	4	4
206	2	1	1	1	2	2	2	2	2	2	2	3	5	1	3	4	3	4	4	5
207	1	1	1	1	2	2	2	2	2	2	2	4	5	5	4	4	3	4	5	5

Table G.1. Continues

NO	V50_1_3	V50_1_4	V50_2_1	V50_2_2	V50_2_3	V50_2_4	V50_3_1	V50_3_2	V50_3_3	V50_3_4	V50_4_1	V50_4_2	V50_4_3	V50_4_4	V50_5	V50_6_1	V50_6_2	V50_7
1																		
2		5	5								5							
3	2	5	4	4	5	4	5	4	4	4	2	2	2	1	2	2	5	4
4	3	4	4	4	4	2	5	5	5	5	2	2	3	2	4	5	4	2
5	5	5	5	5	5	5	5	5	1	5	1	1	1	5	1	5	5	1
6	5	5	5	5	5	5	5	5	5	5	1	5	5	5	2	5	5	3
7	5	5	5	5	5	5	5	5	5	5	2	5	5	5	3	5	5	3
8	5	5	5	4	4	5	5	5	2	4	4	4	4	5	4	5	5	5
9	2	4	4	3	2	2	4	4	3	4	2	3	4	3	4	5	5	4
10	4	4	4	5	5	5	5	5	1	1	3	4	4	3	5	5		4
11	4	4	4	4	4	4	4	4	4	4	3	4	3	4	4	4	4	3
12	5	5	5	5	5	5	5	5	5	5	2	5	5	5	5	5	5	5
13	2	2	4	3	4	3	4	5	3	5	2	2	4	2	4	5	5	5
14	2	4	3	3	4	3	5	5	4	3	3	3	5	4	3	4	4	2
15	4	4	4	4	4	3	4	4	4	3	2	4	2	3	4	4	2	4
16																		
17	4	4	4	4	4	4	5	5	2	4	2	3	4	5	4	4	4	4
18	5	3	4	4	4	4	4	4	4	3	0	3	4	4	4	4	4	2
19	4	4	4	4	4	2	4	5	1	4	2	2	2	2	3	2	5	4
20	4	4	4	4	4	4	4	4	3	4	2	2	2	2	4	4	4	2
21	3	5	3	1	5	1	5	5	5	5	5	3	4	5	4	5	5	5
22	5	4	5	1	4	1	1	1	2	1	3	2	3	2	4	3	2	3
23	2	3																
24	2	3	4	4	4	2	4	4	4	4	4	2	4	2	4	4	3	4
25																		
26																		
27																		
28	3	4	4	4	2	4	4	4	2	2	2	2	2	2	4	3	3	3
29	5	5	4	3	5	4	4	5	4	4	3	3	4	3	4	1	1	2
30	5	5	5	4	3	5	4	5	4	5	2	2	3	2	5	4	4	4
31	5	5	5	5	5	5	5	5	5	5	1	1	5	5	5	5	5	5
32	5	5	5	5	5	5	5	5	5	5	5		5		5	5	5	
33	5	5	5	1	5	2	5	5	5	5	2	2	5	4	4	3	5	3
34	0	5			5	4	5	5	2	5	4	3	0	5	2	4	4	4
35	4	4	4	4	4	3	4	4	3	4	3	3	3	5	1	3	4	3
36	5	5	5	5	5	5	5	5	3	5	3	3	4	2	2	1	5	5
37	5	4	4	2	5	2	3	5	4	5	4	4	4	2	5	4	4	4
38	4	5	4	4	2	2	5	5	1	5	2	2	2	2	4	5	4	4
39																		
40	5	4	5	4	5	5	5	5	5	5	2	4	5	3	5	5	4	5
41	5	5	5	4	4	4	5	4	4	4	4	2	4	4	4	4	4	5
42	5	5	5	2	3	5	4	4	2	4	3	4	4	4	2	4	4	4
43	5	5	5	4		4	4	5	4	4	3	3	3	2	2	3	3	4
44	4	4	4	4	2	4	4	4	3	4	3	3	2	3	3	3	4	4
45	2	4	5	2	2	1	2	4	1	2	2	1	2	2	4	1	4	2
46	4	3	4	4	4	2	4	4	4	4	3	3	4	4	3	3	3	4
47	5	5	5	5	5	2	4	3	2	4	3	3	3	3	2	4	4	4
48	4	4	4	4	4	4	2	4	2	2	2	2	2	2	2	2	4	2
49	4	4	5	3	4	3	3	3	3	3	2	2	3	4		3	2	3
50	4	3	4	2	3	2	5	4	4	4	3	3	4	2	4	4	4	2
51	5	4	5	4	4	4	5		4	3	5		4		5	3	4	5
52	5	5	5	5	5	3	5	5	5	5	5	5	3	5	2	5	5	5
53	4	4	4	3	4	2	5	4	4	4	2	3	3	3	4	4	4	4
54	5	5	5	5	5	1	5	5	3	5	3	3	3	5	5	5	3	3
55	4	4	4	4	4	2	3	5	1	3	4	4	3	1	4	5	5	4
56	3	4	5	1	2	2	1		4	4	3	5	3	3	3	5	5	4
57	5	5	4	2	4	3	5	5	4		4	5	5	4	2	1	4	4
58	5	5	5	5	5	5	5	5	3	5	3	3	5	5	5	5	5	4
59	4	4	4	3	3	3	4	3	3	5	3	3	3		2	4	3	4
60	5	5	5	5	5	3	4	5	4	5	3	4	3	4	3	5	5	5
61																		
62	5	5	3	3	3	3	5	5	5	5	4	2	5	1	4	4	4	5
63	5	5	5	5	5	4	4	4	3	4	3	3	3	5	4	4	4	4
64	5	5	5	5	5	5	5	5	5	5	1	1	1	1	5	5	5	1
65	4	4	5	3	2	2	5	5	5	5	2	1	2	2	4	4	4	4
66	3	4	2	2	2	2	4	4	2	4	3	2	4	4	2	4	4	4
67	5	4	4	1	4	3	5	5	2	5	2	2	3	2	3	4	4	3
68	5	5	5	5	5	3	5	5	3	3	3	3	3	5	5	3	3	3
69	5	4	3	3	3	3	4	3	4	5	3	3	3	3	4	3	3	4
70	2	5	5	5	4	2	5	5	2	5	5	5	5	2	2	2	2	2
71	5	5	5	5	5	5	5	5	5	5	1	1	3	3	5	1	5	2
72	5	5	5	2	5	5	5	5	2	5	2	2	5	5	5	5	5	5
73	4	4	4	4	2	4	5	4	4	4	0	2	2	4	2	5	4	4
74	4	4	4	2	2	0	5	4	4	4	0	4	0	2	3	4	4	2
75	5	4	4	4	4	4	5	5	2	5	5	4	2	5	4	4	5	3
76		5					5	5		5							5	
77																		
78	1	5	5	4	3	3	3	5	1	3	4	2	1	4	4	3	3	2
79	4	4	4	2	3	2	4	4	3	5	3	4	4	3	3	4	4	4
80	5	5	5	5	5	1	5	5	5	5	1	2	2	4	4	5	5	5
81	5	5	5	5	5	1	5	5	5	5	1	2	2	4	4	5	5	5
82	5	5	5	5	5	1	5	5	5	5	1	2	2	4	4	5	5	5
83	5	5	5	5	5	1	5	5	5	5	1	2	2	4	4	5	5	5
84	1	5	5	2	4	4	4	4	4	4	4	3	2	5	2	4	4	5
85	5	4	4	3	3	3	4	4	4	4	3	3	3	2	3	3	3	3
86	4	4	4	4	2	2	4	4	2	4	2	2	4	4	2	4	4	4
87	5	5	5		5		5	5	0	5	3		3	3	3	5		5
88	4	5	4	4	4	4	5	5	5	5	2	4	4	4	2	4	5	4
89	4	4	3	2	4	3	4	4	3	4	4	2	3	2	3	3	3	3
90																		
91	3	4	5	5	4	5	5	5	3	5	5	1	4	4	3	1	1	1
92	4	4	4	4	3	2	5	5	5	5	2	1	2	2	4	4	2	4
93	5	5	5	5	5	4	5	5		5	5	5	5	5	5	5	4	5
94	5	5	5	5	5	3	5	5	3	5	1	1	3	5	4	5	3	2
95	5	5	5	5	5	5	5	5	5	5				5	1	5	5	5
96	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
97	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
98	3	4	3	3	3	3	4	4	3	4	3	3	3	4	2	4	3	4
99	4	4	4	4	4	4	4	4	2	4	2	2	2	4	4	4	4	4
100	4	4	4	3	4	3	4	4	4	4	2	4	4	4	4	4	4	4
101																		
102	3	3	4	4	0	2	2	2	2	2	3	2	3	2		2		

Table G.1. Continues

NO	V50_1_3	V50_1_4	V50_2_1	V50_2_2	V50_2_3	V50_2_4	V50_3_1	V50_3_2	V50_3_3	V50_3_4	V50_4_1	V50_4_2	V50_4_3	V50_4_4	V50_5	V50_6_1	V50_6_2	V50_7
103	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
104	5	5	5	5	4	4	5	5	4	5	2	1	4	5	5	5	4	5
105	5	5	5	3	5	5	5	5	3	5	3	3	3	5	5	5	5	5
106	5	5	5	5	4	4	4	3	3	4	4	4	5	4	5	5	5	5
107																		
108	2	5	1	2	5	5	5	5	5	5	5	5	5	5	5	5	5	2
109																		
110								5	5									5
111	2	3	2	2	5	3	3	2	5	3	2	4	5	5	2	5	5	5
112	4	4	4	3	4	3	4	4	4	4	3	3	4	3	3	4	4	3
113	4	4	5	4	2	3	4	5	3	3	3	1	3	1	4	4	3	3
114	5	5	5	1	1	1	1	5	5	5	5	1	1	5	5	5	5	2
115	4	4	4	2	3	4	4	5	3	5	5	3	4	2	3	5	5	3
116	5	4	4	2	4	2	4		1	2	2	2	3		5	5	4	4
117	5	4	4	4	4	3	4	4	4	4	3	4	3	3	4	3	3	2
118	4	4	4	3	4		4	4	2	4	2	2	2	4	4	3	4	4
119	4		4	4	4		4		4	4		4		4		4	4	4
120	2	4	2	4	2	4	4	4	4	4	2	2	2	2	4	4	4	4
121	5	5	5	4	4	2	5	5	5	5	3	3	3	5	1	5	5	4
122	5	5	5	5	2	5	5	5	5	5	5	2	5	5	1	1	1	1
123	2	4	2	1	1	1	5	4	4	4	2	2	2	2	2	4	4	4
124	3	4	2	4	4	3	4	4	2	4	3	2	3	2	3	2	2	3
125	3	4	3	4	2	1	5	5	4	4		2	0	2	4	2	4	3
126																		
127	4	3	3	3	4	4	2	5	3	4	2	2	2	2	3	1	5	4
128	4	4	3	2	2	2	2	5	5	4	4	4	4	5	4	5	5	2
129	2	4	4	3	4	3	4	4	3	5	2	4	3	4	5	3	4	2
130	5	5	4	4	3	2	4	4	4	4	3	2	3	2	0	3	4	2
131	4	4	5	2	4	3	4	4	4	4	3	2	3	2	4	4	4	2
132	5	5	1	1	3	1	5	5	3	5	2	3	5	1	5	1	3	5
133	4	5	2	2	2	2	2	5	5	5	2	3	3	2	5	5	3	3
134	5	5	5	5	5	2	5	5	2	5	3	5	5	5	5	5	5	5
135	4		5	4	4	2	4	4		4				4	0	4		
136	5	5		1		1	5	5	3	5		3	5		5		3	4
137	5	5	5	4	4	3	4	3	3	3	2	5	3	2	3	3	5	4
138																		
139	4	5	4	2	2	3	4	5	3	3	3	3	3	2	3	3	3	3
140	5	5	5	4	2	1	5	5	4	5	2	3	4	4	0	4	5	0
141	2	2	3	2	2	2	5	5	1									4
142	2	2	2	2	2	2	5	5	1									4
143	5	5	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	1
144	4	4	4	2	2	3	4	4	3	3	2	2	2	2	3	4	3	3
145	4	4	4	3	3	3	4	5	4	4	3	3	2	1	3	4	4	3
146																		
147																		
148																		
149																		
150																		
151																		
152																		
153	2	4	4	5	5	4	5	5	1	5	1	2	2	2	5	5	5	5
154																		
155																		
156																		
157																		
158																		
159																		
160	2	5	2	5	4	2	3	2	4	4	2	2	2	2	4	4	5	5
161																		
162																		
163	2	4	3	3	4		4	4	4	3	3	3	4	5	4	2	3	5
164																		
165	3	3	4	4	3	3	4	4	4	4	3	3	2	2	3	4	4	3
166																		
167	4	4	4	3	4	3	4	5	3	3	3	4	3	1	2	4	2	2
168																		
169																		
170																		
171																		
172																		
173	5	5	5	2	2	3	5	5	3	4	4	4	3	2	2	5	4	2
174																		
175	4	5	5	5	3	2	5	5	3	5	3	3	4	5	3	5	5	5
176																		
177	4	4	4	4	4	3	4	4	2	4	3	3	4	2	2	4	3	4
178	5	5	5	5	5	5	5	5	5	5	2	3	4	4	4	3	5	5
179	4	4	4	4	4	3	4	4	4	4	3	3	3	3	3	3	4	3
180	5	5	5	5	5	5	5	5	5	5	2	5	5	5	5	5	5	5
181	4	5	5	4	4	2	4	4	4	5	2	2	2	1	4	3	5	4
182	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
183		4		2														
184																		
185	5	5	5	3	3	3	3	4	5	5	3	2	3	3	3	4	4	3
186	4	4	4	3	4	3	4	4	4	4	3	2	3	3	4	4	3	4
187	2	5	5	5	5	5	5	5	1	5	5	2	2	5	5	5	5	5
188																		
189	4	4	4	4	4	3	3	4	2	4	2	3	3	2	2	4	3	4
190	4	5	5	4	2	4	4	4	4	5	2	2	2	2	2	2	4	4
191	4	5	4	4	4	3	4	4	3	5	4	3	4	3	4	4	3	3
192	5	5	4	3	2	4	4	4	2	4	3	2	2	2	4	4	4	4
193																		
194	2	4	3	2	2	5	5	4	4	4	2	2	2	2	4	4	4	4
195																		
196																		
197																		
198																		
199	5	4	4	4	4	5	4	4	3	5	4	4	4	5	3	2	4	2
200	3	4	4	4	2	1	4	4	2	2	2	2	3	4	2	3	4	4
201	3	4	4	4	2	1	4	4	2	2	2	2	3	4	2	3	4	4
202	4	4	4	4	4	4	4	5	4	4	4	2	4	2	4	4	4	3
203																		
204	5	5	5	5	5	2	4	5	3	5	2	5	5	5	3	3	4	2
205	4	4	4	3	3	3	3	4	2	5	3	3	4	4	3	1	3	4
206	5	4	5	2	4	3	5	5	5	5	3	5	5	5	3	3	3	4
207	1	5	5	5	4	3	2	3	2	4	2	4	2	2	4	5	5	4

Table G.2. List of Variables

Variables	Label	Q. No.
no	Database no	
build_id	Building_id	
hh_no2	HH No. (Sampling No in Neighbourhoor)	
insured	ZDS purchase behavior	
neighbor	Neighborhood	
v1_1	Hh-Head's Sex	1
v1_2	Hh-Head's Age	
v1_3	Hh-Head's Education Level	
v1_4	Hh-Head's Occupation Sector	
v1_5	Spouse's Sex	
v1_6	Spouse' Age	
v1_7	Spouse's Education Level	
v1_8	Number of Children in Hh	
v1_9	Students in Hh	
v1_10	Small Children (not student)	
v1_11	Elderly in Hh	
v1_12	Household Size	
v1_13	Household Structure	
v1_14	Hh Head Employment Status	
v1_15	Spouse's Employment Status	
v1_16	Retireds in Hh	
v1_17	Other Employeds in Hh	
v1_18	Other Unemployeds in Hh	
v2_1	Wage Income (Private Company)	2
v2_2	Salary Income (Public Institution)	
v2_3	Free Income	
v2_4	Rental Income	
v2_5	Capital and Interest Income	
v3	Household Income Level	3
v4_1	Food	4
v4_2	Education	
v4_3	Housing	
v4_4	Furniture	
v4_5	Insurance	
v4_6	Clothing	
v5_7	Health	
v4_8	Entertainment	
v4_9	Transport	
v5	Housing Maintanance Expenditure (annual/YTL)	5
v6_1	Size of Dw. Uni	6
v6_2	Number of Rooms (#)	
v6_3	The Buying-Selling Value of House	
v6_4	The Rental Value of Dwelling Unit	
v6_5	The Way of Ownership	
v7_1	Number of Floors at the Building (#)	7
v7_2	Number of Dwelling Units at the Building	
v7_3	Age of the Building	
v7_4	Structural System of the Building	
v7_5	Existence of Commercial and Official Units at the Buildings	
v7_6	Number of Commercial and Official Units at the Building	
v7_7	Any Change in the Structural System of the Building	
v7_8	Car Park	
v8	Duration of Residence in Housing (month)	8
v9	Expected Residence Duration in Housing (month)	9
v10_1	Moving plan in the future	10
v10_2	Reason of Moving plan in the future	
v11	Number of housing goods	11
v12	Guarantee of Housing Goods	12
v13_1	Car Ownership	13
v13_2	Car Insurance (yes-no)	
v13_3	Traffic Insurance	
v13_4	Kasko	
v13_5	EQ Insurance for Car	
v14_1	Car Alarm	14
v14_2	Fire Extinguisher in Car	
v14_3	Steel Apartment Door	
v14_4	First Aid Kit At Home	
v14_5	Fire Extinguisher At Home	
v14_6	Housing Alarm	
v14_7	Slatted Shutters or Window-guard in Windows	
v14_8	Diaphone/ Display Screen for Security at the Building Door	
v15_1	Search of Information on ZDS	15
v15_2	Friends/Relatives	
v15_3	Neighbours / Apartment Manager	
v15_4	TV Advertisements	
v15_5	News in the Media	
v15_6	Municipality	
v15_7	Insurance Companies	
v5_8	Internet	

Variables	Label	Q. No.
v16_1	Daily News-Paper	16
v16_2	Information on CEI in Daily News Paper	
v17_1	Premium amount	17
v17_2	Compensation Amount	
v17_3	Where and by whom to be used the aggregated money	
v17_4	To buy an additional home insurance.	
v17_5	The Obligation of Construction License	
v18	Purchase of CEI	18
v18A1_1	Number of years for CEI purchase	18A -1
v18A1_2	ZDS purchase in 2000	
v18A1_3	ZDS purchase in 2001	
v18A1_4	ZDS purchase in 2002	
v18A1_5	ZDS purchase in 2003	
v18A1_6	ZDS purchase in 2004	
v18A1_7	ZDS purchase in 2005	
v18A1_8	ZDS purchase in 2006	
v18A2	Last paid premium amount	18A -2
v18A3	Compensation for last premium amount	18A -3
v18A4_1	security feeling provided by insurance	18A -4
v18A4_2	damage probability of my property	
v18A4_3	cease of state from paying for damages	
v18A4_4	suitability (affordability) of premiums	
v18A4_5	responsibility of the homeowners	
v18A4_6	worry / concern about family	
v18A4_7	encourag. of neighbours	
v18A4_8	encourag.of friends	
v18A4_9	explanations of scientists	
v18A4_10	obligation of ZDS	
v18A4_11	punishment of ZDS	
v18A4_12	procedure for title deed	
v18A5_1	Willing to re-purchase ZDS every year	18A -5
v18A5_2	Willing to purchase additional EQ insurance	
v18A5_3	Finding the OEI premiums unaffordable	
v18A5_4	Finding Compensation of ZDS insufficient	
v18A5_5	The Thought to give up ZDS	
v18A5_6	Willing to purchase ZDS for other owned houses	
v18B1_1	expensive ZDS premiums	18B -1
v18B1_2	the thought that the building is strong	
v18B1_3	other homeowners in the building didn't buy insurance	
v18B1_4	the thought that State will help anyway	
v18b1_5	the low compensation amount of ZDS	
v18B1_6	any punishment for ZDS	
v18B1_7	nobody asks whether I bought insurance or not	
v18B1_8	Not having long term plan in the house	
v18B1_9	Insufficient time	
v18B1_10	Insufficient Knowledge	
v18B1_11	Being Tenant	
v18B2_1	Future Plan to Purchase ZDS	18B -2
v18B2_2	Reason of Positive Future Plan to buy ZDS	
v18B3_3	Reason of Negative Future Plan to buy ZDSI	
v19_1	Insurance types (#)	19
v19_2	Additonal Earthquake Insurance	
v19_3	Life / Retirement Insurance	
v19_4	Insurance of the House Furniture	
v19_5	Housing Insurance	
v19_6	Health Insurance	
v19_7	Fire Insurance	
v19_8	Business Insurance	
v19_9	Accident Insurance	
v19_10	Theft Insurance	
v20_1	Possessed Estates (#)	20
v20_2	House	
v20_3	Commercials	
v20_4	Depot	
v20_5	Land	
v20_6	Nothing	
v20_7	ZDS Purchase for other Estates	
v21_1	Prediction of the neighbours' ZDSrchase (#)	21
v21_2	Prediction of the neighbours' ZDSrchase	
v22_1	Ignorance	22
v22_2	Finding Expensive	
v22_3	Thinking that EQ will not destroy the building	
v22_4	State will help	
v22_5	Being tenant	
v22_6	I don't know	

Table G.2. Continues

Variables	Label	Q. No.
v23_1	Monerary loss prediction for house (YTL)	23
v23_2	Willingness to pay CEI premium for house (YTL)	
v23_3	Monetary loss prediction for housing goods (YTL)	
v23_4	Willingness to pay insurance premium for housing goods (YTL)	
v23_5	Expected bodily damage/ injury	
v23_6	Willingness to pay insurance premium for injuries (YTL)	
v24	Sources for EQ Loss Compensation (#)	24
v24_1	My Own Assets and Financial Accumulation	
v24_2	Relatives / Friends	
v24_3	Bank Credit/ Loan	
v24_4	ZDS/ DASK	
v24_5	Other Insurances	
v24_6	State Aid	
v25_1	View about Legislation of ZDS	25
v26_1	Unlicenced buildings should also be comprised to insurance coverage.	26
v26_2	Insurance premiums of unlicenced buildings should be higher than the others.	
v26_3	People at lower risk should pay lower premiums.	
v26_4	Owners of illegal and unlicences buildings are low income families.	
v26_5	It is not fair that the low income families at high risk pay the full price of insurance.	
v26_6	If the annual insurance payments are determined concerning the risk level, it will not be in favour of low income families.	
v26_7	State should provide insurance assistance to the low income families.	
v26_8	The annual insurance payments should not change concerning the risk level.	
v26_9	Insurance premiums souldn't be differ in respect of risk so that homeowners will be encouraged to minimize the possible risks.	
v27_1	Insurance system should encourage people to take mitigation measures by giving certificate to the retrofitted houses.	27
v27_2	People do not buy earthquake insurance, because they know the government will assist in the case of a disaster.	
v27_3	I am sure that ZDS premiums will only be used for earthquakes	
v27_4	Aggregated annual insurance payments should be used in Turkey for damage reduction investments.	
v27_5	Aggregated annual insurance payments should not only be used after earthquakes, but also before earthquakes to retrofit the present insured buildings.	
v27_6	Aggregated annual insurance payments should be used to provide credits to the municipalities for retroffiting.	
v27_7	Municipalities should get credits from insurance according to their efforts and success in risk reduction.	
v27_8	A certain amount of aggreted premium resources should be transferred to anoter fund to be used to reduce te risks of school, hospital and other infrastructure sytems.	
v28_1	Everyone must purchase earthquake insurance.	28
v28_2	Everyone including people with low risk should purchase earthquake insurance.	
v28_3	It is not fair while some are purchasing insurance, others are not.	
v28_4	Insurance should be thought as a tax for earthquake.	
v28_5	To oblige the earthquake insurance, the people without insurance should be imposed effective punishments.	
v28_6	There should be enacted an "earthquake insurance law" that include effective punishments.	
v28_7	Earthquake insurance premiums can be reflected to oter obligatory payments such as electricity, water, telephone.	
v28_8	Earthquake insurance can be reflected to the property-house tax.	
v28_9	I am confused about the reluctance of people participating to the insurance system.	
v28_10	Insurance system is a form of social solidarity, which provides sharing the earthquake losses by all society.	
v28_11	To prepare the society against earthquake, earthquake insurance should be obligatory.	
v28_12	If the earthquake insurance is not compulsory, nobody will buy insurance and after an earthquake, everybody will expect State aid.	
v28_13	It doesn't matter, whether the earthquake insurance is compulsory or not, because State doesn't force it.	
v28_14	People should be encouraged and persuaded to buy insurance voluntarily.	
v28_15	Earthquake insurance should be bought completely voluntarily	
v28_16	Only those with high risk should be forced to buy earthquake insurance.	
v28_17	Earthquake insurance should be compulsory for the buildings instead of the housing units in the buildings. Therefore, all units in a building will be insured.	
v28_18	Earthquake insurance should only be compulsory for the high and moderate income homeowners.	
v29_1	There should be more advertisements in television.	29
v29_2	There should be television programs, which explain earthquake and insurance.	
v29_3	There should be courses in the schools, which explain earthquake and insurance.	
v29_4	There should be prepared more campaigns for insurance.	
v29_5	A national state of war for insurance should be declared.	
v29_6	Earthquake insurance policy should be required during the payment of electricity, water and natural gases invoices.	
v29_7	There should be monetary punishment for uninsureds.	
v29_8	There should be imprisoning for uninsureds.	
v29_9	State shouldn't assist for housing to the uninsureds.	
v29_10	If all homeowners in a building are insured, this building should become a certificate each year.	
v29_11	The buildings that renew their insurance policies each year should become premium discount.	
v29_12	The buildings that renew their insurance policies each year should become discount in housing tax.	
v29_13	The buildings that renew their insurance policies each year should get technical assistance for retrofitting from municipality.	
v29_14	The buildings that renew their insurance policies each year should have priority for retrofitting.	
v29_15	The buildings that renew their insurance policies each year should have priority for retrofitting credits from banks or State.	
v29_16	The retrofitted buildings should become insurance premium discount.	
v29_17	Obligatory eartquake insurance should be given to the private sector as independent from State.	
v30_1	Traffic Accidents	30
v30_2	Street Theft	
v30_3	Cancer	
v30_4	Earthquake	
v30_5	Burglary	
v30_6	Fraud	
v30_7	Flood	
v30_8	Falling into Hollow	
v30_9	AIDS	
v30_10	Contagious Disease	
v30_11	Food Poisoned	
v30_12	Fire	
v30_13	GSM Stations	
v30_14	Terror	
v30_15	Bird Flu	
v31_1	Traffic Accidents	31
v31_2	Street Theft	
v31_3	Cancer	
v31_4	Earthquake	
v31_5	Burglary	
v31_6	Fraud	
v31_7	Flood	
v31_8	Falling into Hollow	
v31_9	AIDS	
v31_10	Contagious Disease	
v31_11	Food Poisoned	
v31_12	Fire	
v31_13	GSM Stations	
v31_14	Terror	
v31_15	Bird Flu	
v32_1	Traffic Accidents	32
v32_2	Street Theft	
v32_3	Cancer	
v32_4	Earthquake	
v32_5	Burglary	
v32_6	Fraud	
v32_7	Flood	
v32_8	Falling into Hollow	
v32_9	AIDS	
v32_10	Contagious Disease	
v32_11	Food Poisoned	
v32_12	Fire	
v32_13	GSM Stations	
v32_14	Terror	
v32_15	Bird Flu	

Table G.2. Continues

Variables	Label	Q. No.
v33	Source of the Earthquake Knowledge (#)	33
v33_1	My Own Experiences	
v33_2	The Stories Told By The Old People	
v33_3	From The Experience of My Friends and Other People.	
v33_4	From My Researches and Negotiations	
v33_5	From Books, News and Television.	
v34	Previous Earthquake Experience	34
v35	The Damage in the building in 1999 Earthquakes	35
v36_1	Earthquakes are natural events that cannot be predicted before	36
v36_2	The losses from earthquakes are the result of not- to-pay attention to the natural conditions	
v36_3	The losses from Earthquakes are the consequence of unsuitable urbanization and construction	
v36_4	Earthquakes provide an opportunity to people to behave in a conscious and rational way	
v36_5	It is possible to take measures greatly with the scientific and technical methods against earthquakes	
v36_6	People cannot be successful against the power of nature, whatever precautions they take	
v36_7	Earthquake damages can be predicted before	
v36_8	Earthquakes with great losses do not occur often in Turkey	
v36_9	Earthquakes threat me and my relatives greatly	
v36_10	I try to not think the earthquake threat	
v36_11	There are more sensitive people in the family	
v36_12	I can loss my life during an earthquake	
v36_13	The earthquake threat was not known formerly. It is a new kind of threat	
v36_14	I can loss my wealth in great amount during an earthquake	
v36_15	Earthquake threat is exaggerated too much	
v37_1	Great Damage in Istanbul	37
v37_2	Great Damage in Zeytinburnu	
v37_3	Great Loss of Life in the Building	
v37_4	Great Damage in the Building	
v37_5	An Earthquake during Life-Time	
v37_6	An Earthquake in 10 years	
v38_1	Safety of House-Building	38
v38_2	Safety of Work-Building	
v38_3	Safety of the School	
v38_4	Safety of the nearest hospital of village clinic	
v38_5	Safety of the nearest hazardous materials production or storing places	
v39_1	The ground of my house-building is safe.	39
v39_2	There is no inspection in the building.	
v39_3	The building is safe according to the inspections.	
v39_4	When the necessary precautions are taken, the building can be made safe against an earthquake.	
v39_5	Taking the required damage reduction measures has great benefits.	
v39_6	The damage in the building depends on the coincidences.	
v40_1	Apartment management decided to take RMMs	40
v40_2	Majority Doesn't Want	
v40_3	Majority Wants but there were Appeals	
v40_4	This issue was never in the Agenda	
v41_1	The majority will appeal with law court to this situation.	41
v41_2	I will obey to the decisions without any appeal.	
v41_3	I can accede to leave here for 3-6 monts during these operations.	
v41_4	I prefer the cheapest one of the retrofitting operations.	
v41_5	I prefer the safiest one of the retrofitting operations even it is the most expensive one.	
v41_6	I will sell my estate and move to anoter place under this compulsion.	
v41_7	Under this compulsion, there should be an exemption from real estate taxes at least for 10 years.	
v42	Taking RMMs in the building	42
v42A1_1	inspection of the building's vulnerability	42A-1
v42A1_2	already had a retrofitting project	
v42A1_3	retrofitting the bearing system	
v42A1_4	taking a retrofitting certificate	
v42A1_5	strenghten foundation and basement	
v42A2_1	Cost of Structural RMMs (YTL)	42A-2
v42A2_2	Share of Hh in Structural RMMs (YTL)	
v42A3_1	High Probability of Earthquake	42A-3
v42A3_2	Cease of State to Pay Damages	
v42A3_3	Protection and Increase of Housing Value	
v42A3_4	Unsafe Ground of the Building	
v43A3_5	Unsafe Buildings	
v42A3_6	Explanations of Scientists	
v42A3_7	RMMs have more benefit than costs	
v42A3_8	RMMs are profitable investments for the future	
v42A3_9	Encouragement of Neighbours/Building Manager	
v42A3_10	Encouragement of Friends/Relatives	
v42A3_11	Worry about Saving Lives in the Family	
v42A4	Finding Already Taken RMMs Insufficient	42A4

Variables	Label	Q. No.
v42B1_1	Neighbours do not support retrofitting.	42B-1
v42B1_2	We have a retrofitting decision, but we couldn't afford.	
v42B1_3	The building is safe. No need to take any measure.	
v42B1_4	I will agree on investigation and doing project.	
v42B1_5	I want to take measures at the building, even the neighbours do not want.	
v42B1_6	The earthquake possibility is low.	
v42B1_7	My home will not be damaged.	
v42B1_8	I intend to move away this house.	
v42B1_9	I do not know the cost of these measures.	
v42B1_10	The cost of the damage reduction measures is expensive.	
v42B1_11	Few people among my friends and relatives have already taken.	
v42B1_12	I do not know what I can do.	
v42B1_13	I haven't had any time.	
v42B1_14	I do not have any knowledge about the necessary measures.	
v42B2_1	Consulting associated scientists and professionals.	42B-2
v42B2_2	Inspecting the building and ground technically and financially.	
v42B2_3	Negotiating with the neighbours in the building for the structural safety.	
v42B2_4	Searching information about the taken measures of the neighbour buildings.	
v42B2_5	Searching information from other people who have already implemented.	
v42B2_6	Trying to persuade the neighbours to make doing retrofitting project	
v42B2_7	Negotiating with developers.	
v42B2_8	Moving due to my hopeless by neighbours.	
v42C1	Fasten big furniture.	42C
v42C2	Buy fire extinguisher.	
v42C3	Store hazardous materials safely.	
v42C4	Prepare emergency aid kit	
v42C5	Stockpile food and water	
v42C6	Buy specific tools	
v42C7	Get first aid education.	
v42C8	Learn how to behave during an earthquake to rescue myself and my kin.	
v42C9	Learn the necessities to work during rescue	
v42C10	Prepare an emergency meeting plan with family.	
v42C11	Participate to the studies against disasters in the apartment and neighbourhood.	
v42C12	I did nothing.	
v43_1	Quarter Headman	43
v43_2	District Municipality	
v43_3	Istanbul Metropolitan Municipality	
v43_4	Central Government	
v43_5	Building Inspection Firms	
v43_6	DASK	
v43_7	Universities	
v43_8	Media	
v43_9	Architectures and Engineers	
v43_10	Developers	
v43_11	Homeowners	
v44	Which one is bearable to retrofitt the building?	44
v45_1	Hospitals	45
v45_2	Dams	
v45_3	Fire stations	
v45_4	Schools	
v45_5	Stadiums	
v45_6	Bridges and Underpasses	
v45_7	Hazardous Waste Storage Buildings	
v45_8	Natural Gas Mains and Pipe Lines	
v45_9	Commercial and Official Buildings	
v45_10	Public Areas	
v45_11	High-rise buildings	
v45_12	Communication systems	
v45_13	Other Public Buildings	
v45_14	Police Stations	
v45_15	Power Lines	
v45_16	Mosques	
v45_17	Historical Buildings	
v46	Where to apply after an earthquake	46
v47_1_1	Free Architecture and Engineers	47-1
v47_1_2	Developers	
v47_1_3	Building Inspection Firms	
v47_1_4	Voluntary Foundations - NGOs	
v47_1_5	DASK	
v47_1_6	Universities	
v47_1_7	District Municipality	
v47_1_8	Istanbul Metropolitan Municipality	
v47_1_9	Ministry of Public Works	

Table G.2. Continues

Variables	Label	Q. No.
v47_2_1	Free Architecture and Engineers	47-2
v47_2_2	Developers	
v47_2_3	Building Inspection Firms	
v47_2_4	Voluntary Foundations - NGOs	
v47_2_5	DASK	
v47_2_6	Universities	
v47_2_7	District Municipality	
v47_2_8	Istanbul Metropolitan Municipality	
v47_2_9	Ministry of Public Works	
v48_1	State (Central Government)	48
v48_2	Istanbul Metropolitan Municipality	
v48_3	District Municipality	
v48_4	Homeowners	
v48_5	Tenants	
v48_6	Building Inspection Firms	
v48_7	Developers	
v48_8	Architecture and Engineers	
v48_9	DASK	
v48_10	Scientists	
v49_1	Housing assistance should be only for insured homeowners.	49
v49_2	housing assistance for everyone - all victims of earthquake including uninsureds	
v49_3	less housing assistance to the uninsured	
v49_4	housing assisstance for everyone - also including the owners of illegally houses	
v49_5	less housing assistance for homeowners of illegal houses	
v49_6	any housing assistance for homeowners of illegal houses	
v49_7	housing assistance for tenants (such as rent subsidies)	

Variables	Label	Q. No.
v50_1_1	The young people should be more disciplined nowadays.	50
v50_1_2	Military Service is very necessary.	
v50_1_3	I do not prefer to meet the people who cannot separate the truths and wrongs.	
v50_1_4	To continue the family traditions is important.	
v50_2_1	In a fair system people with more ability should earn more	
v50_2_2	If a person has the get-up- and to acquire wealth, that person should have the right to enjoy it.	
v50_2_3	Saving money is the main reason for hard work.	
v50_2_4	The state should less intervene to economy.	
v50_3_1	If people in this country were treated more equally we would have fewer problems.	
v50_3_2	The state should make sure everyone has a good standard of living.	
v50_3_3	I would support a tax change- additional taxes that support people with less fortunate.	
v50_3_4	The world could be a more peaceful place if its wealth were divided more equally among nations.	
v50_4_1	There is no use in doing things for people - you only get t in the neck in the long run.	
v50_4_2	Cooperating with others rarely works.	
v50_4_3	The future is too uncertain for a person to make serious plan.	
v50_4_4	I feel that life is like a lottery.	
v50_5	I have control on the events happening in my life.	
v50_6_1	I feel myself as belong to the building, environment and neighbourhood, where I live.	
v50_6_2	I participate to the constitutions related to solve the problems of my neighbourhood.	
v50_7	In daily life, the earthquake threat and preparedness against earthquakes is spoken in my social medium and in my friend environment.	

VITA

PERSONAL INFORMATION

Surname, Name: Taylan, Arzu

Nationality: Turkish (TC)

Date and Place of Birth: 23 April 1976 , Ankara

Marital Status: Single

Phone: +90 312 210 22 04

Fax: +90 312 210 79 65

email: arztaylan@gmail.com

EDUCATION

Degree	Institution	Year of Graduation
MCP	METU City Planning	2003
BCP	METU City and Regional Planning	2000
High School	Ankara Anadolu High School, Ankara	1994

WORK EXPERIENCE

Year	Place	Enrollment
2002- Present	METU Department of City and Regional Planning	Research Assistant
2004-2005	Karlsruhe Institute of Technology, Institute of Banking and Insurance	Visiting Researcher (DAAD Sandwich Program)

FOREIGN LANGUAGES

Advanced English, Fluent German

PUBLICATIONS

1. Housing Affordability of Households in Turkey, The General Assembly for Housing, Chamber of City Planners, Istanbul, Turkey, May 2002.

2. Compulsory Earthquake Insurance and Urban Risk Management. Planning, Chamber of City Planners, Ankara, 2007 (2).