INTEGRATED WATER RESOURCE MANAGEMENT PLANNING: THE CASE OF THE KONYA CLOSED BASIN

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ABSTRACT

INTEGRATED WATER RESOURCE MANAGEMENT PLANNING:
THE CASE OF THE KONYA CLOSED BASIN

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The aim of the thesis is to examine the *Integrated Water Resource Management (IWRM) Planning* that is recognized as the most appropriate approach in the international arena for the *wise-use* and *sustainability* of water resources. In this framework, the thesis has been organized in two major parts: Theoretical framework and the Konya Closed Basin case study analysis. The first part draws a theoretical framework on IWRM planning and discusses its principles, aims and implementation tools through an internationally accepted point of view. The second part, meanwhile, examines the interpretation of the IWRM planning in Turkey and its implementation in the case of the Konya Closed Basin IWRM Planning Process.

The study reveals that only an *integrated approach at the basin scale* can solve the water demand problems of different human activities, which puts pressure on the carrying capacity of the water resources and their basins. Despite the inadequacies in the related institutional

and legal frameworks in Turkey, Konya Closed Basin IWRM planning, especially Tuz Lake Management Plan studies, comes to forefront as a pioneering IWRM planning practice: The *capacity building, public participation, and awareness raising* principles of the IWRM planning approach have been positively realized during this planning process. Besides, the components of the plan are also compatible with the theory of IWRM planning, which consists of *strategic, goal-oriented, and participatory* planning approaches.

Key words: Sustainability, Integrated Approach, Basin Scale, Public Participation, Capacity Building

ÖZ

ENTEGRE SU KAYNAKLARI YÖNETİM PLANLAMASI:
KONYA KAPALI HAVZASI ÖRNEĞİ

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Yüksek Lisans, Şehir ve Bölge Planlama Bölümü

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Tezin amacı, su kaynaklarının *akılcı kullanımı* ve *sürdürülebilirliği* için uluslararası ölçekte en uygun yaklaşım olarak kabul edilen *Entegre Su Kaynakları Yönetimi Planlaması'* nı incelemektir. Bu kapsamda, tez iki temel kısımdan oluşmaktadır: Kurumsal çerçeve ve Konya Kapalı Havzası örneğinin incelenmesi. Tezin birinci kısmında, entegre su kaynakları yönetimi planlamasının kurumsal çerçevesi çizilmekte ve uluslararası ölçekte kabul gören ilkeleri, amaçları ve uygulama araçları tartışılmaktadır. İkinci kısımda ise, bu yaklaşımın Türkiye'deki yansımaları, Konya Kapalı Havzası Entegre Su Kaynakları Yönetim Planlama süreciyle birlikte değerlendirilmektedir.

Bu çalışma, çeşitli insan faaliyetleri sonucu ortaya çıkan, ve su kaynakları ve havzalarının taşıma kapasitesini zorlayan su talebi sorununun ancak *havza ölçeğinde* uygulanan *entegre bir planlama yaklaşımıyla* çözülebileceğini ortaya koymaktadır. Türkiye'de bu kapsamda henüz yeterli kurumsal ve yasal çerçeve oluşturulamamış

olsa da, Konya Kapalı Havzası Entegre Su Kaynakları Yönetim Planı, özellikle Tuz Gölü Yönetim Plan çalışmaları, öncü bir entegre su kaynakları yönetim plan uygulaması olarak ön plana çıkmaktadır: bu plan sürecinde entegre su kaynakları yönetim planının *kapasite artırımı, farkındalık oluşumu ve halk katılımı* ilkeleri olumlu bir şekilde uygulanmıştır. Ayrıca, plan bileşenleri, entegre su kaynakları yönetim planının *stratejik, hedefe yönelik ve katılımcı* planlama yaklaşımlarını içeren kurumsal çerçevesiyle de aynı doğrultudadır.

Anahtar Kelimeler: Sürdürülebilirlik, Entegre Yaklaşım, Havza Ölçeği, Halk Katılımı, Kapasite Artırımı

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LIST OF ABBREVIATIONS

IWRM—Integrated Water Resource Management

IRBM—Integrated River Basin Management

NGOs—Non-Governmental Organizations

IBA—Important Bird Areas

IPA—Important Plant Areas

IHA—Important Habitat Areas

WFD—Water Framework Directives

CHAPTER I

INTRODUCTION

Water is the resource that sustains every form of life on earth. It provides complex networks between natural resources and human beings. Therefore, agricultural, industrial, domestic, recreational, and environmental human activities directly or indirectly affect the water resources.

Since water resources have permanent interconnection with human activities, water demand increases parallel to urbanization. This situation creates crucial pressures on water resources and breaks the hydrological circulation of them. Traditional water management approaches based on *point problem solving* method have become insufficient to solve these water resource problems while meeting water needs. A new water management approach is needed, which is more comprehensive and systematic in order to both deal with water demands and maintain water resources. Literature and practical cases suggest that only an *integrated approach,* which is a collaborative process of various experts and users from different sectors, can solve water-related problems. It is supposed to contribute to sustainable development, because water and land are linked by a number of complex natural, social and economic processes.

To raise the awareness on the significance of water resources, international water conferences have been organized since 1977 (See Table II.1). In these conferences, “sustainable development” has been assumed as the key issue and “integrated water resource management” (IWRM) has been accepted as an appropriate management approach to solve the dilemma between human development and water resource conservation (Dıvrak 2008, 155-163; Priority Actions Programme Regional Activity Centre Split 1997, 28).

Since IWRM has a wide scope ranging from a basin, it has several components related to various disciplines such as planning, public administration, environmental engineering, civil engineering, etc. In this thesis, I will examine the *“IWRM planning”* component of this approach that considers the *basin scale* as the most appropriate scale to deal with water problems, because a basin is a kind of bowl where all kinds of sub-water resources are gathered in the main water resource. Any human or non-human activity performed at some point of the basin influences on the entire basin system. This is to say that basins are not only topographic and hydrologic units, but also have biological, economical, sociological, and political significance. Moreover, all land of the world is a part of a basin system. Therefore, the IWRM planning approach defines the basin as the suitable planning scale (Göl 2005, 1033).

Land-use decisions at any spatial scale determine the location and intensity of agricultural, industrial, domestic, recreational and environmental activities; and all these activities are directly or indirectly connected to fresh water resources –lakes, rivers, wetlands—. Therefore, spatial planning (and particularly regional

planning since it deals with a much broader area than urban planning) has to pay attention to the sustainable use of these resources. Therefore, this thesis aims at examining the IWRM planning approach that is supposed to be a sustainable planning approach, in which the interrelations of human activities and water resources are organized in a participatory manner.

Examining the theoretical aspects of the IWRM planning, and exemplifying it in a case study from Turkey, this study tries to answer the following questions:

1) Why the water management concept came into being in the world,
2) How and why IWRM approach has been accepted as an appropriate management approach,
3) What the general principles of IWRM planning are,
4) What the successful practices of IWRM planning are in the world,
5) How the water resources are managed in Turkey,
6) As an IWRM planning practice in Turkey, how the Konya Closed Basin IWRM Planning Process was realized and what results were attained.

The study has two main parts: In the *first part* (Chapter II, III, IV), it draws a theoretical framework on IWRM planning and discusses its principles and implementation tools through an internationally accepted point of view. In the *second part* (Chapters V, VI); it examines the interpretation of the IWRM planning in Turkey and its implementation in the case of the Konya Closed Basin IWRM Planning Process. The study finishes with a conclusion chapter.

The chapters of the study are organized as follows:

Chapter II is to examine water problems in the world; focus on the outcomes of the international conferences to solve these problems; and underline the IWRM concept which was brought about as a major outcome of these conferences in order to answer why the water management concept came into being in the world.

Chapter III is to give a theoretical framework about the IWRM planning by explaining its general principles, planning process and tools. In addition, **Chapter IV** is to examine IWRM planning practices in the world in order to realize how this approach implemented in the world and also why it is to be successful.

The IWRM planning approach has been brought about in Turkey to provide a balance between regional development and nature conservation. Therefore, **Chapter V** is to include the interpretation of this approach in Turkey. This chapter is to analyze general conditions of water resources in Turkey, institutional and legal structures related these resources, water resource management planning implementations and their results. Examining how water resources are managed and planned in Turkey, this chapter aims at providing a background for the case study; i.e. the Konya Closed Basin IWRM Planning Process

Depending on what the theory of IWRM planning suggests, **Chapter VI** is to examine the Konya Closed Basin IWRM Planning Process in terms of its aims, planning tools, implementations, and outcomes at the regional level. The Konya Closed Basin IWRM Planning Process is selected as the case study, because it is an *efficient* and

functioning example of IWRM planning attempts in Turkey with its planning approach based on *integrated, participatory*, *goal-oriented* and *strategic* methods as explained in the literature.

It should be noted that the Konya Closed Basin IWRM Planning Process, which is to cover the entire basin, has just be launched; but the efforts towards this process has been performed since 1997 — the analyzing studies started in 1997; however the IWRM planning efforts began in 2003. The Tuz Lake Management Planning Process has been one of the important pilot projects realized in the Konya Closed Basin, and it is supposed to pioneer to the Konya Closed Basin IWRM Planning Process. Therefore, this chapter is to analyze the Tuz Lake case as a catchment level project. Tuz Lake Management Planning Process is also an efficient example of environmental protection with its participatory planning approach, local focus and transparency principle. Besides, it is the only completed catchment level project in Turkey.

Finally, **Chapter VII** is to evaluate the discussion and mention conclusions of the study.

CHAPTER II

THE WATER RESOURCE MANAGEMENT PLANNING

II.1. Need for Water Resource Management Planning

Historically, humans have been crucially dependent on fresh water; i.e. lakes, rivers, and groundwater aquifers, which is readily accessible. Therefore, they regarded water as an infinite resource. However, rapid population growth and urbanization (urban drinking water and sewerage demands), and economic expansion (water use of agricultural and industrial sectors) have caused the overuse and abuse of water resources over the past few decades and greater imbalance between water availability and water demand. This imbalance has brought about serious water crises in many regions of the world, such as water scarcity, water quality deterioration, and destruction of freshwater resources. Deterioration of water quality has been observed in big cities, and led to water-borne diseases and destruction of natural resources downstream. At the same time, more than half of the population lacks access to adequate sewerage infrastructure systems. Water scarcity impacts on food availability, human health, livelihoods and also economic development (Kataoka, Yatsuka 2002, 1; International Water Association & United Nations Environmental Programme 2002, 5-28).

According to Water and Sanitation Report of World Health Organization and UNICEF (2006), in the period of 1990-2004, the

world population increased 17%, and share of urban population increased from 43% to 49%. Due to this population growth and urbanization level, drinking water supply also increased 17%, and it is predicted to increase approximately 12% until 2015. Moreover, sewerage system supply increased 32% and it is predicted to increase 28% until 2015. Despite the increase in drinking water and sewerage system supply, it was still insufficient to meet the drinking water and sewerage system demands of total world population (World Health Organization and UNICEF 2006, 6-7, 39). Figure II.1 and Figure II.2 show the distribution of drinking water and sanitation services in the world.

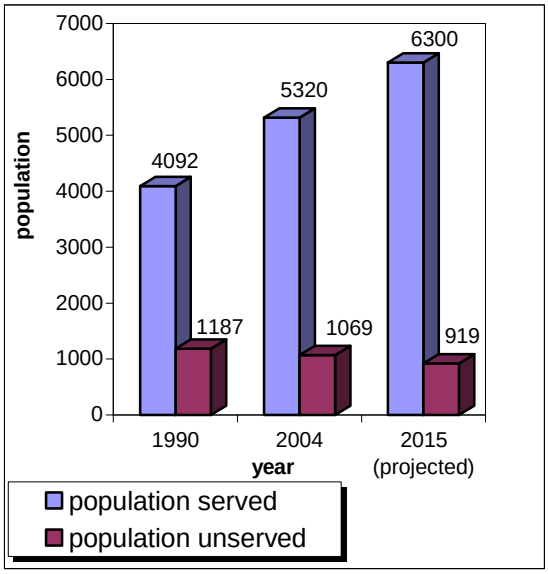


Figure II.1: World Population with and without Access to a Drinking Water Infrastructure System in 1990, 2004 and 2015
(Source: World Health Organization and UNICEF 2006, 6)

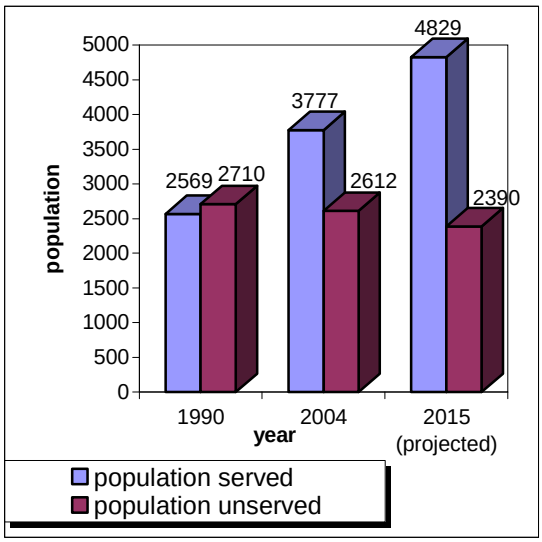


Figure II.2: World Population with and without Access to a Sewerage Infrastructure System in 1990, 2004 and 2015
(Source: World Health Organization and UNICEF 2006, 7)

It is mentioned in the Water and Sanitation Report that

> *"In 2004, a total of 5.3 billion people … used water from improved sources – up from 4.1 billion (78%) in 1990. But because of population growth, the number of people unserved has not changed substantially since 1990. About one sixth of the world population … remains without access to improved drinking water…"* (World Health Organization and UNICEF 2006, 8)
>
> *…*
>
> *"In 2004, 2.6 billion people in the world did not have access to basic sanitation… Since 1990, the number of people without sanitation has*

decreased by only 98 million…" (World Health Organization and UNICEF 2006, 18)

The insufficient drinking water and sewerage system supply has caused socio-economic inequalities and health problems throughout the world. There is an obvious inequality between developed and under-developed regions, and also between urban and rural areas in terms of drinking water and sewerage system coverage (World Health Organization and UNICEF 2006, 14, 19). In other words, poor people are much more affected by these insufficient services due to their worse life conditions. They cannot access to safe water and sewerage system, therefore, their children less than 5 years of age in particular become victim of water-born diseases, and most of the time, insufficient physical and economic conditions cause them to die (International Water Association & United Nations Environmental Programme 2002, 27; World Health Organization & UNICEF 2005, 12).

Figure II.3 and Figure II.4 show the share of population to which drinking water is not served in different regions of the world. In these figures, regional differentiation is clearly seen. Nearly 50% of the population without access to drinking water infrastructure system is in Eastern Asia and Southern Asia. Another 30% live in sub-Saharan Africa. In addition, in developing regions, 84% of the unserved live in rural areas (World Health Organization and UNICEF 2006, 9, 13).

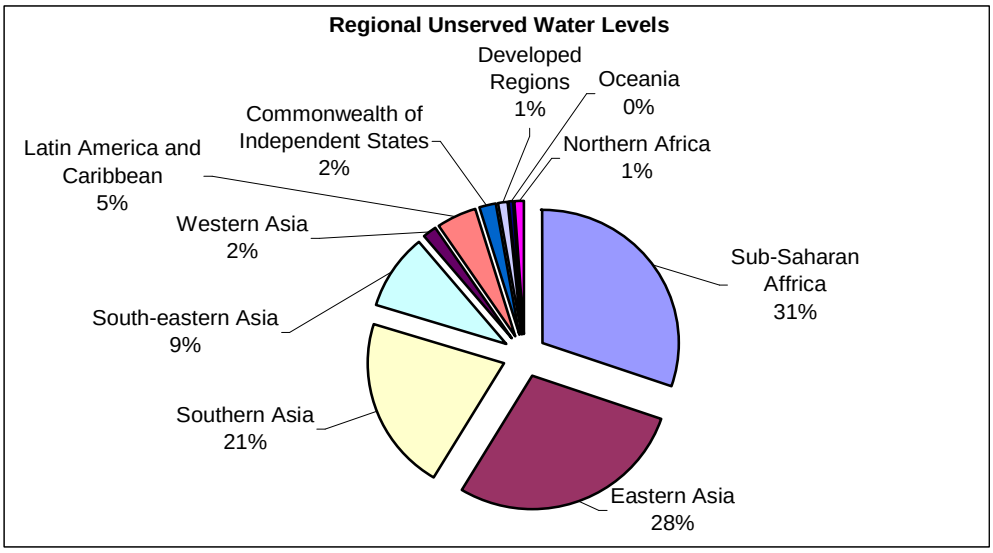


Figure II.3: Population (millions) without Drinking Water Infrastructure System by Region in 2004 (Source: World Health Organization & UNICEF 2006, 9)

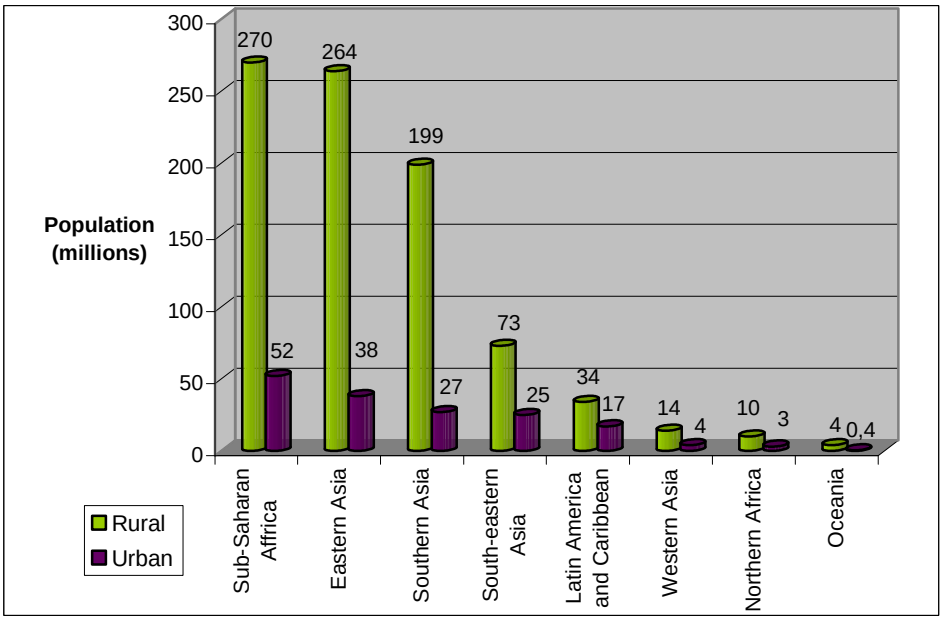


Figure II.4: Rural and Urban Population (millions) without Access to a Drinking Water Infrastructure System in 2004 in Developing Regions (Source: World Health Organization & UNICEF 2006, 13)

Figure II.5 and Figure II.6 show the population without a sewerage infrastructure system by regions. According to the figures, 2.6 billion people are unserved globally and most of them live in undeveloped regions. Like drinking water services, 66% of the population without access to drinking water infrastructure system is in Eastern Asia and Southern Asia. Moreover, 18% are in Sub-Saharan Africa. Globally, rural sewerage infrastructure system coverage is less than half of the urban sewerage infrastructure system coverage and this disparity is lower in developing regions (World Health Organization and UNICEF 2006, 17-19).

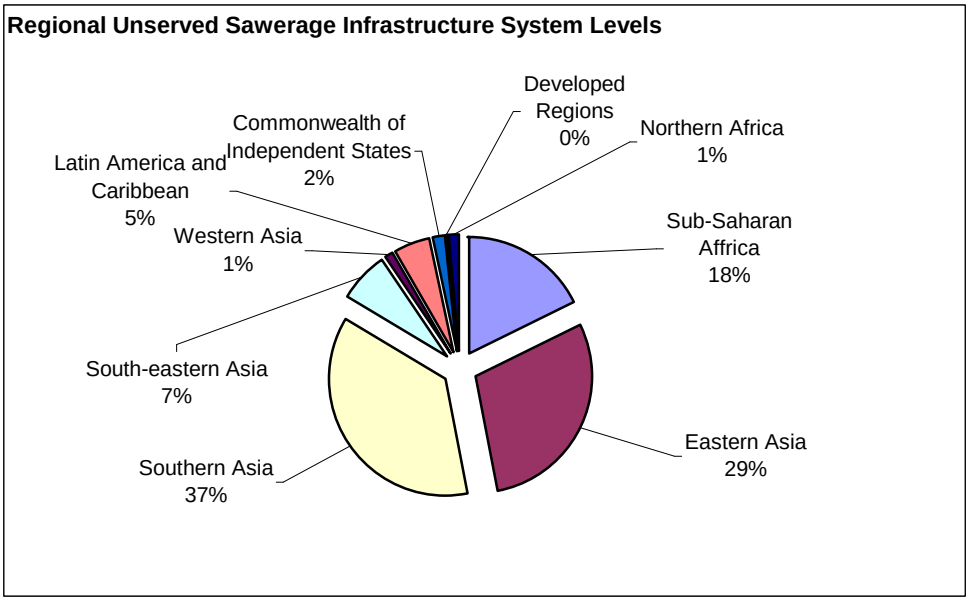


Figure II.5: Population (millions) without a Sewerage Infrastructure System by Region in 2004 (Source: World Health Organization & UNICEF 2006, 17)

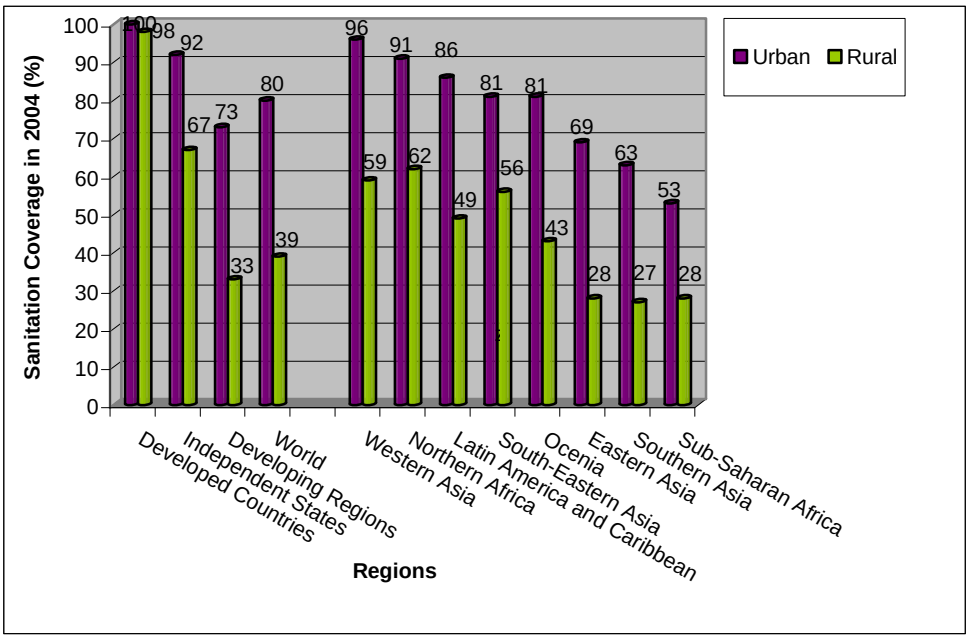


Figure II.6: Urban and Rural Disparities in terms of Accessibility of a Sewerage Infrastructure System by Region in 2004
(Source: World Health Organization & UNICEF 2006, 19)

Throughout the world, the top five communicable diseases in 2002 in terms of early mortality were respiratory infections, HIV/AIDS, diarrhea, tuberculosis, and malaria. Although not all of these can be directly related to water issues, they are closely connected with water supply, sewerage infrastructure and habitat challenges. Approximately 40% of the total world population is at risk of infection in water-born diseases (UNESCO 2006, 20).

In 2001, 70% of water was used for agricultural purposes, 22% for industrial purposes, and 8% for domestic purposes throughout the world. These rates differentiated between developed and developing countries. Industry in developed countries led to the exploitation of water resources remarkably. UNESCO reported that 59% of water is

used in industrial sector in high-income countries (See Figure II.7). On the contrary, in developing countries, irrigation required wide-range of water use and caused environmental impacts. According to UNESCO's report, 82% of water is used in agricultural sector in low and middle-income countries (See Figure II.7). Since agriculture does play a vital role in food supply, population growth causes increase in the percentage of water use (UNESCO, http://www.unesco.org/water/wwap/facts_figures/water_industry.shtml, accessed on January, 2008; International Water Association & United Nations Environmental Programme 2002, 11-12).

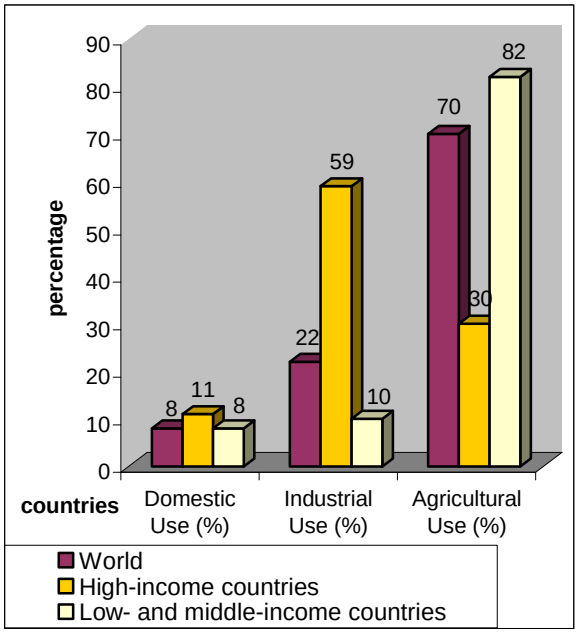


Figure II.7: Sectoral Water Use in the World in 2001
(Source: "World Bank 2001, Executive summary of the WWDR." UNESCO, http://www.unesco.org/water/wwap/facts_figures/water_industry.shtml, accessed on January, 2008)

Demand for sufficient and high-quality water resources for human consumption, sewerage infrastructure, agricultural irrigation, and manufacturing will continue to scale up because of population increase, urbanization, industrialization, and commercial development. Besides, it should be highlighted that human beings use water faster than precipitation and more than natural capacities of water resources. Therefore, wise use of water resources is necessary for minimizing the negative impacts of human activities. However, it is argued that the traditional method remains insufficient to attain the wise use aim, since it is a piecemeal, singular approach to address issues of economy, environment, or social health by isolating one from another (Flint 2004, 41-43).

In conclusion, vis-à-vis the rapidly increasing population and expansion of urban areas, drinking water and sewerage system supplies cannot meet the demands throughout the world. As a result, water related health problems and regional disparities in terms of water and sewerage services have occurred. Noting the severity of these environmental and sanitary problems, a number of international conferences have been organized since 1977, which directly or indirectly addressed the use of water resources.

II.2. Outcomes of the International Conferences on Water Resource Management Planning

The international conferences listed below aimed at achieving a new management approach for wise-use of natural resources:

- 1977 United Nations Conferences on Water
- 1987 Our Common Future

- 1990 Global Consultation on Safe Water and Sanitation for 1990s
- 1992 United Nations Conference on Environment and Development
- 1992 International Conference on Water and the Environment
- 2000 Second World Water Forum
- 2001 International Conference on Freshwater
- 2002 The World Summit on Sustainable Development
- 2003 Third World Water Forum
- 2006 Forth World Water Forum

The conferences, first of all, highlighted the *sustainable development* concept. Sustainable development has been accepted as the key approach for solving the dilemma between human development and natural resource conservation (Flint 2004, 43-44). Flint defines the sustainable development as:

> *"…progressive socio-economic betterment without growing beyond ecological carrying capacity: achieving human well-being without exceeding the Earth's twin capacities for natural resource regeneration and waste absorption*" (Flint 2003 cited in Flint 2004, 44)

Secondly, since sustainability of all natural resources and human activities crucially depend on water resources, these conferences also underlined the *freshwaters* as a priority area to attain sustainable development. Regarding freshwaters, *water resource management* concept has been mentioned for equitable solution of the water problems, and wise use of water through sustainable

development systems. It is defined as a systematic approach that takes care of the ecological integrity and ecosystem services of water resources by also emphasizing their integration to social and economic issues (Flint 2004, 45-46). It is a very complex management system with its stakeholders, assessments, plans, implementations, and evaluations. Its methods and sub-approaches are still discussed in various international and regional conferences. Table II.1 and Table II.2 display the outcomes of the above mentioned conferences; and in these tables, the goals, success and failures of these conferences are listed in terms of evaluations of various related water experts.

Table II.1: Goals, Successes and Failures of the International Conferences (on Water Resource Management) Organized between 1977 and 1992

THE NAME OF THE CONFERENCES	United Nations Conference on Water	Our Common Future	Global Consultation on Safe Water and Sanitation for the 1990s	United Nations Conferences on Environment and Development	International Conference on Water and the Environment (ICWE)
TIME	1977	1987	10-14 September 1990	3-14 June 1992	1992
PLACE	Mar del Plata, Argentina	Brundtland	New Delhi, India	Rio De Janeiro	Dublin, Ireland
GOALS	• Assess the status of water resources • Ensure that an **adequate supply** of quality water was available • Increase **water use efficiency** • Promote preparedness nationally and internationally • Avoid a water crisis of global dimension before the end of 20th century	• Propose **long-term environmental strategies** for achieving sustainable development by the year 2000 • Recommend ways for obtaining **greater co-operation** among countries about the environmental issues • Consider ways and means for dealing with environmental concerns • Define shared perceptions of long-term environmental issues	• Extend sustainable and socially acceptable services • Political commitment is essential • Protect the environment and safeguard health through the **integrated management** • Discuss the **institutional reforms** for promoting an integrated approach	• Work towards international agreements • Accept the **environmental protection** as an integral part of the development process • Identify the special **priority areas** • Accept the **global partnership** for implementation of sustainable development principles	• Recognize **fresh water as a finite, vulnerable, and essential** resource • Manage water in an **integrated manner** • Consider **participatory approach** at all levels of water development and management

Table II.1 (continued)

GOALS		• Define economic and social development goals in terms of sustainable development • **Conserve and use the environment and natural resources for the benefits of present and future generations** • Achieve fundamental right for all human-beings to an environment adequate for their health and well being • Provide timely and relevant information between states for effective environmental assessment and activities	• Discuss the community management of services • Adopt **more effective financial strategies** in the 1990s for the long-term sustainability of the sector	• **Build the capacity** for sustainable development • Obtain **participation of all concerned citizens** for environmental issues • Prepare national and international **environmental legislation** • Emphasize **women's vital role** on environmental protection	• Accept **women's central role** in the provision, management, and safeguarding of water. • Consider the **water as an economic good**, in equity and poverty approaches
SUCCESS	• First internationally coordinated approach to **Integrated Water Resource**	• **Definition of sustainable development** that is acceptable for all countries.	• Urging countries and Ecological Society of America (ESA) to **formulate**	• Establishment of a **new and equitable global partnership** • Creation of new	• Focus on the necessity of **Integrated Water Resource**

Table II.1 (continued)

SUCCESS	**Management** (IWRM) • Active **participation** of the developing world • Discussion of various aspects of water management • Provision of potable water and sanitation facilities to all • **Acceleration of political will** and investment in the water sector • A major milestone in the history of water resources development	• Emphasis on **interconnection of environment and development** • Handling environmental issues together with social and economic concerns • Formulation of **interdisciplinary and integrated approach** to global concerns and our common future • **Non-governmental organizations, educational institutions, and scientific community** all play great roles in creation of public awareness • Addressing **local people, governments and private enterprise** to take decisions about our common future	**and implement action plans for water and sanitation** • Asking the UNDP (United Nations Development Programme) to take a leading role in implementation process • Suggestion of a new global forum for the exchange of information and promotion of the sector • Emphasis on 'some for all rather than more for some'	levels of **cooperation** among states, key sectors of societies and people • Application of an **integrated approach** to the development, management, and use of water resources • Proposing seven programme areas for the freshwater sector	**Management** • Attainment of **active participation** of all stakeholders from to highest level to small communities • Highlighting the **special role of women in water management**

Table II.1 (continued)

FAILURE	• An implementation scheme for the Action Plan was not developed during discussion • Transboundary water resources management was not discussed comprehensively				• It was a meeting of experts rather than an intergovernmental meeting • Participants failed to indicate how the principles could be implemented • Developing world did not actively participate • It did not consider the outcomes of Mar del Plata

(Source: United Nations, http://www.un.org/documents/ga/conf151/acon15126-lannex.htm, accessed on October , 2007; Ring of Peace , http://ringofpeace.org/environment/Brundtland.html, accessed on October, 2007; New Delhi State, www.jiscmail.ac.uk/files/WSSCC/**NEWDELHI**.DOC), accessed on November, 2007; Rahaman and Varis 2005, 15-16)

Table II.2: Goals, Success and Failures of the International Conferences between 2000 and 2006 on Water Resource Management

THE NAME OF THE CONFERENCES	The Second World Water Forum	International Conference on Freshwater	The World Summit on Sustainable Development	Third World Water Forum	Fourth World Water Forum
TIME	17-22 March 2000	December 2001	2002	March,2003	22 March 2006
PLACE	The Hague, the Netherlands	Bonn, Germany	Johannesburg, South Africa	Kyoto, Japan	Mexico City
GOALS	• Move to decisions '**from Vision to Action'** • Consider outcomes of previous water initiatives • Acknowledge water's social, environmental, and cultural values • Make 'Water Everybody's Business' • Consider water privatization and **public-private partnerships** • Apply equity criteria	• Contribute to solutions for global water problems • Support preparations for next conferences • Achieve most capable tool for water security needs of the poor • Promote decentralization and new partnerships • **Suggest IWRM as the most capable tool** • Prioritize actions in the fields of governance, financial and technical	• Define specific targets and guidelines for implementation • Prepare water efficiency plan by 2005 for all major river basins • Improve water-use efficiency • Facilitate **public-private partnerships** • Develop **gender-sensitive policies and programs**	• Achieve safe, clean water for all • Discuss 'good governance' concept • Obtain **capacity building** • Discuss financing issue • **Increase public participation** • Discuss various regional topics • Prepare declaration on a range of water issues • Develop **the river-basin plans** for its implementation in practice	• Provoke discussion and strengthen understanding of water related management • Discuss needs of minimum level of infrastructure for water security • Consider new models for financing water initiatives • **Clarify roles and responsibilities of authorities and local providers** • **Discuss institutional development, right, and political processes for implementation of IWRM**

Table II.2 (continued)

GOALS	• Discuss that water could empower people and women • **Obtain efficient water use by IWRM approach** • **Consider that IWRM comprises all related disciplines and stakeholders with a systematic approach**	• **Harmonize water issues with overall sustainable development objectives** • **Prioritize education and training activities for water wisdom** • Identify set of actions to necessary to mobilize financial resources • **Prepare IWRM plans in the river basin scale**			• Consider transboundary management as a tool for peace • Discuss **capacity building and social learning** for water supply and sanitation • Apply of science, technology and knowledge in terms of water sustainability for food and environment • Discuss targeting, monitoring and implementation assessment for risk management
SUCCESS	• **Include a range of stakeholders** related to water management • Discuss implementation extensively • **Covert visions into action programs** for the participating	• Focus on practical implementation • Provide action programs to implement policies • Become a historical milestone for making IWRM truly effective in the field	• **Put IWRM at the top of the international agenda as accepted policy tool** • **Involve all concerned stakeholders in a variety of processes**	• **Make IWRM the most integral part of all water initiatives** • Address the necessity of sharing benefits equitably • Consider **gender perspectives** in water policies	• Represent unique opportunity to foster world's attention on water related issues. • Obtain **larger multi-stakeholder process** of the water community • Organize information on the outcomes of the various meeting for making Virtual Forum

Table II.2 (continued)

SUCCESS	countries • Gather world water leaders and communities together (active participation) • **Put IWRM on the political agenda** • Move to full-cost pricing • Increase public funding for research and innovation • Discuss **co-operation** to manage international basins • Increase investment in water massively • Consider about **river-basin scale for** • **implementation of IWRM**	• **Focus education and training on water wisdom** • Focus research and information management on problem solving • Obtain actions for sharing knowledge and innovation technologies • Obtain actions for improving economic efficiency to sustain operations and investment • Obtain actions for ensuring significant increase all types of funding • **Accept the river-basin scale as a catchment level for IWRM implementation**	• Enhance education • Combat corruption • Discuss changing of sustainable water management in the water world for the years to come. • **Consider about improvement of river-basin plans**	• **Facilitate stakeholder participation** • Ensure good water governance and transparency • **Build human and institutional capacity** • Develop new mechanisms of **public-private partnership** • Promote **river basin management** initiatives • Cooperate between riparian countries • Encourage scientific research	• Secretariat of the Forum attend water-related meetings and act as a facilitator • Organize communication activities in relation with the major meetings • Secretariat of the Forum is in regular contact with donors and work with **local people** to bring water issues of a region to their attention • The 2nd Children's World Water Forum and the 4th Youth World Water Forum is both held to prepare the next generation of water managers.

Table II.2 (continued)

FAILURE	• Many water professionals oppose privatization	• No clear mechanism provide for implementing the river basin concept into practice	• Still clear mechanisms are provided for implementation of river basin plans		

(Source: Rahaman and Varis 2005, 17; World Water Council, www.**world**d**watercouncil**.org, accessed on January, 2008; International Water Association & United Nations Environmental Programme 2002, 7-8)

II.2.1. Key Concepts and Issues Highlighted in the International Conferences

As explained in Table II.1 and Table II.2, ***Integrated Water Resource Management***, which is a systematic process for allocating and monitoring water resource use in the context of social, economic and environmental objectives, has become a concept and a strategy for policy change in the water sector for the beginning of the conferences. ***Active participation*** is another concept, which has been discussed and implemented since 1977. These two concepts came to forefront in the conferences, because it was obvious that global water crises could only be solved by integration of all related disciplines and active participation of all related stakeholders.

Sustainable development concept was introduced in 1987 in the Report named "Our Common Future" and integrated water resource management (IWRM) has been handled with sustainability since then. Our Common Future defines the sustainable development as follows:

> *"It meets the needs of the present without compromising the ability of future generations to meet their own needs."* (World Commission on Environment and Development 1991, 8)

Formulation of an ***integrated approach*** was also an outcome of this conference, because sustainability is a function of various economic, environmental, ecological, social, and physical goals and objectives. No single discipline and no single stakeholder interest group can have the wisdom to know what will be sustainable (Loucks, Stakhiv

and Martin 2000, 43). The conference introduced a different scope of ***participation;*** besides the countries' delegates, participation of non-governmental organizations, local people, and private enterprises were considered, too. Meanwhile, ***education of people*** for sustainable development was highlighted in this conference.

In the 1990s, conferences considered ***implementation*** more than theoretical discussions and all decisions and actions were made for this purpose. A new level of cooperation was created and ***priority areas*** were decided for the implementation activities. In addition, national and international rules were defined for protection of water resources. Conferences also discussed ***women's vital roles*** in water resource management, and formation of institutional basis for ***capacity-building*** which is necessary in IWRM implementations. Information exchange and financial strategies were developed with this institutional formation.

The conferences that were held between 2000 and 2006 aimed at developing implementation approaches and tried to reach local people for ***making water everybody's business***. In these conferences, all activities that had been discussed in the previous conferences were implemented. Educational and training activities were made by supporting non-governmental organizations. A new mechanism was developed for ***public-private partnership***. Human and institutional capacity was built as an implementation tool. Moreover, the ***river-basin*** concept was introduced for IWRM implementations, and it was accepted as the most suitable scale for the catchment level plans and their implementations. However, no clear mechanism was provided for the implementation of river-basin plans.

II.2.2. Integrated Water Resource Management Planning Agreed as an Appropriate Approach in the International Conferences

The IWRM planning approach was recognized as an appropriate approach for water resource management in the first water conference in 1977. After that all conferences aimed at developing IWRM principles and creating tools for implementation of these principles. The key concepts that came into picture with the IWRM are:

- sustainability,
- active participation,
- education,
- capacity-building,
- stakeholders,
- river-basin plans

Several councils –such as the World Water Councils, Global Water Partnership, International Water Management Institute, International Water Association, etc—organized activities in order to educate people about efficient water use and to explain them the IWRM planning approach. In one of these activities, Global Water Partnership has defined the IWRM planning as a process that provides coordinated management of water, land and related resources in order to maximize social and economic conditions with considering sustainability of vital ecosystems. The experts participated to the conferences also claimed that IWRM planning is an integration of different disciplines, governmental institutions and non-governmental organizations for providing this coordinated

management (Jones, Newborne and Philiphs 2006, 5; Hooper 2003, 14-15).

Moreover, in these conferences, it is mentioned that IWRM planning processes should be performed at the ***catchment level*** for its efficiency. The ***river-basin*** and ***watershed*** are accepted as fundamental units for the catchment level plans and implementations. Besides these conferences, Water Framework Directives, which have been prepared by the United Nation Commission since 2000, also clearly define the border of a river-basin and emphasize the crucial linkage of river-basin plans and the IWRM planning approach. Since rivers are linked to the surrounding land systems, they are significant areas within watersheds in order to implement the IWRM planning approach efficiently. All activities performed on land affect on the river systems, and the ecological health of the land systems reflects the ecological health of the river systems. This indicates the impacts of land management practices on water ecological processes and necessity of an integrated approach. This is also the justification of accepting the river-basin and watershed as a basic unit for the IWRM (Ministry of Environment and Forestry, www.emwis.org/documents/pdf/20051215_AylaEfeoglu.pdf, accessed on February, 2008; Hooper 2003, 15).

CHAPTER III

THE INTEGRATED WATER RESOURCE MANAGEMENT PLANNING

III.1. General Principles

Since all water resources have particular characteristics; each IWRM planning process is prepared by using specific methods and principles. Still, there are general principles that are accepted in the international conferences:

- IWRM planning should be *holistic*. This principle is described as the broadest management of all physical characteristics of water resources together with socio-economic and political factors across a water basin region (Margerum 1997, 465). As mentioned before, water is required for many different purposes, functions, and services; therefore, IWRM planning does not only involve the management of natural resources, but it is also the coordination of human activities that create water demands, land-use, and water-borne waste products. The holistic perspective is the most common and necessary characteristic of the IWRM (Global Water Partnership Technical Advisory Committee 2000, 14-15).
- IWRM planning should be applied at *catchment level—watershed or sub-basin scale*. The catchment level is the specific and smallest complete hydrological unit of analysis and management

for implementation of IWRM planning (International Water Association & United Nations Environmental Programme 2002, 48). The catchment management plays a leading role in encouraging public participation by building a common interest towards the water resource (Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand 1998, 7).

- IWRM planning should follow a *systems approach*. Since all water resources are part of a complex environmental and social system, an efficient systematic approach is necessary for IWRM planning. Any decision at one point of a water resource could affect all water systems directly or indirectly. Therefore; analyses and models, which are part of a systematic approach, should be used for an efficient IWRM planning process (International Water Association & United Nations Environmental Programme 2002, 48).
- IWRM planning should be *strategic*. The strategic approach is necessary for filtering of the key aspects of systems. Since water resource systems have too many complex variables and changing conditions, planners and managers cannot address all these complex problems. They should be more selective and focus on key parameters to provide a more efficient IWRM planning (Margerum 1997, 468).
- IWRM planning should be *goal-oriented*. This means the identification of common goals and activities by stakeholders. It is really important to arrive at a shared understanding of problems and develop proactive, common directions for solving these problems. Since this approach is proactive, it focuses on blocking

future threats of a water system rather than reacting after problems exist (Margerum 1997, 467).

- IWRM planning should follow an *adaptive management approach*. Adaptive management is a policy implementation approach that develops an optimal management capacity. It maintains ecological resilience that makes systems react to crucial stresses, and generate flexibility in institutions and stakeholders that react to changing conditions. It is important for effective implementation of IWRM planning, because adaptive management depends on reasonable understanding of major factors influencing water quality, the impacts of past changes and development on current water quality, and then acting adaptively and dynamically with respect to these conditions. Moreover, adaptive management is necessary because it is driven bottom-up by local needs and priorities, and top-down by regulatory responsibility (Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand 1998, 10; Johnson 1999, 1-3; Lankford & Cour 2005, 3; International Water Association & United Nations Environmental Programme 2002, 48).
- IWRM planning should follow a *participatory approach*. Participatory approach emphasizes the need for stakeholder involvement in water resource management planning. This involvement needs new institutional arrangements with transparency and accountability for all decisions. Stakeholders from all social groups should be involved in decision making process at different stages of water management planning process. Therefore, governments at national, regional and local levels have the responsibility for making participation possible.

This involves the creation of mechanisms for stakeholder consultation at all stages of the process and at all spatial scales, such as national, basin or aquifer, catchment and community levels (International Water Association & United Nations Environmental Programme 2002, 48; Global Water Partnerships 2003, 2; Global Water Partnership Technical Advisory Committee 2000, 15-17).

- IWRM planning should follow a *capacity-building approach*. Capacity building approach involves education and awareness raising of stakeholders about water related issues, data resources for making policies, and obtaining basic infrastructures and market stability. This approach includes all stakeholders, technical staffs, coordinators, and political units. Most of the stakeholders, especially in developing countries, lack necessary knowledge about water management planning, catchment level, and corporate government concepts and their roles related to these concepts. Even many of them do not have any idea about what a catchment and watershed is. Therefore, capacity building is important to provide the stakeholders with sufficient information on hydrological, bio-physical, economic, social and environmental characteristics of a water resource, and improving their abilities to predict the most important responses of the water resource system to factors such as effluent discharges, diffuse pollution, changes in agricultural or other land use practices and building of water retaining structures. Capacity building approach is also necessary for adoption of best technologies and practices as a management instrument (International Water Association & United Nations Environmental Programme 2002, 48-50).

- IWRM planning should obtain *reliable and sustained financing*. Clear and long-term financial support from government or other project partners is necessary for sustaining the successful implementation of IWRM planning approach. This support is generally obtained by income from a healthy water and sanitation market, especially when the goods and services are produced by local providers, and when there is active reinvestment in the sector (International Water Association & United Nations Environmental Programme 2002, 50).
- IWRM planning should recognize *water as an economic good*. The recognition of water as an economic good is very important to achieve equitable allocation and sustainable use of water. Many past failures in water resource management depended on the acceptance of water as a free good. However, water allocations should be optimized by benefit and cost, and aim at maximizing water benefits to society per unit cost in order to obtain maximum benefits from available water resources. Adequate resources should be financially independent of general revenues for the effectiveness of water resource management agencies and water utilities. Therefore, fully supply cost should be recovered for sustainability of investment. However, this situation brings about some concerns about the protection of the poor. To avoid confusion over this concept, transparent financial linkages among different organizations, users and management agencies are fundamental to successful implementation of water policies for specific disadvantages groups (International Water Association & United Nations Environmental Programme 2002, 49-50; Global Water Partnership Technical Advisory Committee 2000, 18-21; Global Water Partnerships 2003, 2).

- IWRM planning should pay attention to the *social dimension of water management*. It requires attention to social impact assessment, work place indicators and other tools to ensure social dimension of sustainable water policy implementations. It also includes equitable access to water by all social groups, and employment and income implications of change. Moreover, it implies improved decision making technically and scientifically in terms of balancing social dimension of IWRM planning policies (International Water Association & United Nations Environmental Programme 2002, 48-50).
- IWRM planning should strengthen *the roles of women*. Women participation in IWRM planning as decision maker positively influences on project quality and sustainability, because women play a key role in the collection and safeguarding of water for domestic and agricultural use. However; their roles are still less influential than men in management, problem analysis, decision-making, and plan implementation process. Therefore, IWRM planning needs to form new mechanisms to increase women's access to decision-making and other steps of water management planning in order to improve efficiency of the process (Global Water Partnership Technical Advisory Committee 2000, 17-18; International Water Association & United Nations Environmental Programme 2002, 50).

In conclusion; IWRM planning represents new major approaches for policy makers and spatial planners. It brings about changes such as shift from sectoral to integrated management, from top-down to stakeholder and local responsive approaches, from supply fix to demand management, from commands and controls to more

cooperative of distributive forms of governance, and from closed experts to more open, flexible, transparent and communicative bodies (Global Water Partnerships 2003, 2). Below table summarizes the principles of the IWRM planning.

Table III.1: Principles of IWRM Planning

Principles of IWRM	**Explanation**
IWRM planning should be holistic	It is the broadest management of all physical characteristics of water resources with socio-economic and political factors across a water basin region
IWRM planning should be applied at a catchment level	The catchment level is the specific and smallest complete hydrological unit of analysis and management for implementation of IWRM planning
IWRM planning should follow a systems approach	Since all water resources are part of a complex environmental and social system, an efficient systematic approach is necessary for IWRM planning
IWRM planning should be strategic	It is linked to filtering process that is focusing on key aspects of systems that help achieve system goals
IWRM planning should be goal-oriented	It is the identification of common goals and activities among stakeholders
IWRM planning should follow adaptive management approach	It is a policy implementation approach that develops an optimal management capacity
IWRM planning should follow participatory approach	It emphasizes the need for more stakeholder involvement in water development and management
IWRM planning should follow capacity building approach	It involves education and awareness raising of all stakeholders about water; and all related data collection activities for making assessment, problem identification, planning, implementation and evaluation about the plan area.

Table III.1 (continued)

IWRM planning should obtain reliable and sustained financing	Clear and long-term financial support from government or other partnerships is necessary for sustaining the successful implementation of IWRM planning approach
IWRM planning should recognize water as an economic good	It is very important to achieve equitable allocation and sustainable usage of water
IWRM planning should pay attention to social dimension of water management	It requires attention to social impact assessment, work place indicators and other tools to ensure social dimension of sustainable water policy implementations
IWRM planning should strengthen the roles of women	Women participation in IWRM planning as decision maker positively influences project quality and sustainability because women play a key role in the collection and safeguarding of water for domestic and also agricultural usage

III.2. Legal Framework

Although the principles of IWRM planning were defined in the international conferences, many resulting commitments to IWRM planning were often not implemented. The arguments still remain in *reducing the gap between theoretically agreed policies and implementations* (Lawson 2005, 152; Efeoğlu 2005, 4).

In order to solve this problem, in the late 1990s, the European Commission for Environmental Protection agreed upon the need to combine the laws settling the limit concentrations of pollutant with laws settling water standard launched since the 1970s. This combination created a scientific and technological base for implementation of IWRM planning policies according to the principles of sustainable development. Then, in 2000, this approach was

transformed to the "**Water Framework Directives (WFD)**" the context of which refers to the implementation of a water policy, which aims at protection and sustainable consumption of surface and underground water bodies throughout Europe (Lawson 2005, 152; Efeoğlu 2005, 5).

Unlike the legal framework of traditional water resource management, which focused on a specific and single part of water bodies, the WFD approach puts forward a strategic and integrated sustainable use of water resources by gathering all related sectors into a unified framework depending on specific importance and priorities of each water basin. This legal framework also adapts to institutional, cultural and legal traditions of each water basin in Europe (Lawson 2005, 153).

The aims and targets of WFD are:

- Using the IWRM planning approach in the management of the river basins— the borders of these basins are not limited with national boundaries, since importance of transboundary water resource management is emphasized
- Holistic conservation of surface and underground water resources
- Maintenance and treatment of all water resources until 2015
- Assessment of water quality standards and emission controlling principles together; and eliminating priority harmful components
- Wise pricing of water consumption for its sustainable use

- Public participation to water management process to make them share their knowledge and experiences (Efeoğlu 2005, 6-7; World Water Directive, http://www.euwfd.com/html/wfd_-_a_summary.html, accessed on August 3, 2008; VAN WIJK, F.J. et al. 2003, 5-8).

The key concepts focused in the WFD depending on these aims and targets are:

- *integrated approach,*
- *river basin scale,*
- *ecological quality,*
- *sustainable water resource management,*
- *hazardous wastes,*
- *economical analyses,*
- *adaptation of UN laws*

(Efeoğlu 2005, 10; World Water Directive, http://www.euwfd.com/html/what_is_the_wfd_.html, accessed on August, 2008; VAN WIJK, F.J. et al. 2003, 8-10).

Moreover, some aspects of these key concepts are listed as follows (Water Framework Directives 2000, 1-21; Efeoğlu 2005, 11; Lawson 2005, 153):

- Establishing a framework for Community action in the field of water policy (Article1)
- Classification of water resources in terms of their quality and quantity (Article4)

- Characteristics of the river basin district, review of the environmental impact of human activity and economic analysis of water use (Article5)
- Waters used for the abstraction of drinking water (Article7)
- Monitoring of surface water status, groundwater status, and protected areas (Article8)
- Recovery of costs for water services (Article9)
- A combined approach for point and diffuse sources (Article10)
- Programmes of measures (Article11)
- River basin management plans (Article13)
- Public information and consultation (Article14)
- Strategies against pollution of water (Article16)
- Strategies to prevent and control pollution of groundwater (Article17)
- Implementation (Article24)

III.3. Planning Tools

The literature defines three basic planning tools to perform that are compatible with the principles and legal frameworks mentioned above are:

1) Public Participation
2) Social Capacity Building Activities
3) Staging of IWRM Planning Process

III.3.1. Public Participation

Public participation is a process of public involvement in problem solving, planning, policy setting, or decision making stages of an IWRM planning process. For an effective IWRM planning process, public inputs should be used and stakeholders[1] should be given the opportunity to influence on and share responsibility for decisions (Davenport 2003, 218; Lawson 2005, 153-154). The most important questions here are that who the "publics" (or stakeholders) are and how they influence the IWRM planning process. According to Thomas Davenport,

> "*Typical "publics" for watershed management projects are local, state, and federal government agencies; environmental and conservation organization; individuals living and working in watershed; businesses in the watershed or that rely on material from the watershed; taxpayers; and national environmental organizations*." (Davenport 2003, 220)

The benefits and advantages of public participation in the IWRM planning include the following:

- The decision is made in terms of publics' perspectives, values, and knowledge of the issue and possible solutions.

[1] Stakeholder is a person or organisation with a legitimate interest in a given situation, action or enterprise (Wikipedia Homepage, http://en.wikipedia.org/wiki/Stakeholder, accessed on August 3, 2008)

- Stronger commitment results are obtained when public involve in the decision making process.
- Public participation influences on other people and volunteers to involve in the implementation of the IWRM plan.
- Public participation reduces the burden on governmental agencies by building responsibility distributions.
- Public participation reduces the likelihood of conflicts, legal actions, delays, and greater resource exploitations.
- Public participation obtains and maintains local support for IWRM planning effort.
- Decisions obtained in public participation process are responsive to local needs and reflect the desires of the community.
- Public participation contributes the direct, immediate knowledge of community members about the watershed or river-basin conditions, concerns, and issues.
- Public participation is necessary for planning committee to make better decisions.
- Public participation increases the potential for IWRM plan implementation by demonstrating broad community support (Davenport 2003, 218-219; Sawhneya, Kobayashib, Takahashic, Kingd and Morie 2007, 117-120; Lawson 2005, 153-154).

There are three levels of public (stakeholders):

1. International Stakeholders: These stakeholders provide a framework for managing the water resources across international boundaries, where one water resource is in the borders of two or more countries. Such stakeholders are often based on non-governmental voluntary agreements; but they also include inter-

governmental integration between authorities (Global Water Partnerships 2003, 39; Global Water Partnership Technical Advisory Committee 2000, 48-49).

2. National Stakeholders: These stakeholders consist of cross-sectoral interactions of governmental departments and inter-agency task forces between non-government organizations and ministries. The aim is often the provision of coordination between different governmental departments. In many situations, responsibility is shared between a number of governmental departments –such as ministry of environment and forestry, ministry of agriculture, ministry of industry, etc. Therefore, cross-sectoral integration is necessary for the easy functioning of these ministries together. Global Water Partnerships suggest structural change within government agencies and creation of new departments, commissions, or authorities for building a national partnership organization (Global Water Partnerships 2003, 41; Global Water Partnership Technical Advisory Committee 2000, 45-46).
3. Catchment Level Stakeholders: These stakeholders are specialized ones that come together by political authorities, or in response to public demands. Some countries group their municipalities, industries and other water users as catchment level stakeholders in order to implement IWRM planning process. In addition, sub-national level stakeholder groups –local NGOs, provincial directorships of related municipalities, special regional associations—are also established in order to control local level service providers to make their duties effectively (Global Water Partnerships 2003, 43; Global Water Partnership Technical Advisory Committee 2000, 46).

Among the catchment level stakeholders, local authorities play an important role in both their boundaries and local or regional catchment levels, because they act as regulating bodies and service providers. They also have a crucial role in raising finance and providing communication between local people, government and experts. It should be mentioned that practices of local authorities also lead to negative effects on aquatic ecosystem at catchment level through energy supplies, land-uses, point and non-point pollution, construction practices, public education, solid waste and urban drainage practices. Therefore, it is necessary to create a coordination mechanism between local authorities and other institutions to improve quality of water bodies and security of watersheds and their depended aquifer (Global Water Partnerships 2003, 55; Global Water Partnership Technical Advisory Committee 2000, 49).

Table III.2 explains which kind of integration types is used for different stakeholder levels.

Table III.2: Relationship Between Integration Types and Stakeholders

Level of Stakeholders / **Integration Type**	International Stakeholders	National Stakeholders	Catchment Level Stakeholders
International Integration	√		
Intergovernmental Integration			√
Inter-sectoral (cross-sectoral) Integration		√	√
Government & non-government Integration	√	√	√
Science & Management Integration	√	√	√

(Source: Lecture notes of the course CE497 given by Atila Uras, 2006)

These stakeholders are further divided into two in terms of their roles: *Partners (coordinators)* and *Other Participants*. Partners are the supporters and coordinators of the IWRM planning studies; and they have an institutional system due to their management and organization roles. Other participants are the stakeholders that involve in the IWRM planning process with respect to their professions and interests.

Institutional systems of the partners are explained as follows:

- **Partnership Organization:**

Building partnership and its maintenance is a key element for an IWRM planning process, because many forums of effective IWRM planning are not possible without additional organizational supports apart from governments. Since putting all functions within one agency can lead to conflicting interest and loss of transparency; different individuals and organizations come together to discuss concerns and interests through a water resource partnership. Briefly saying, a partnership is defined as an association of persons, organizations, and agencies joined for jurisdictional or geographical approach to obtain effective IWRM planning (Davenport 2003, 37-38; Global Water Partnership Technical Advisory Committee 2000, 45).

General aims of building partnership are:

- Supporting more efficient use of financial resources of IWRM planning
- Helping to create more creative and acceptable way to manage and protect environmental resources
- Helping to obtain a community commitment to natural resources
- Providing support for issues such as capacity building, research, guidelines for good practice, preparing pilot IWRM planning programmes, monitoring and data collection (Davenport 2003, 37-38; International Water Association & United Nations Environmental Programme 2002, 40).

The elements of partnership building includes working together, joint interest and shared responsibilities in order to achieve common goals

for IWRM planning process. For providing a feasible and transparent approach in IWRM planning with an open dialogue, this process starts with stakeholder analysis, gap analysis, development of common goals, planning, program design, social changes accompanied by social capacity building, co-operative inquiry, supporting self-organization and organizational development and conferencing (Davenport 2003, 38; Global Water Partnerships 2003, 57).

At the beginning, a forum is organized for landowners, citizens, educators, local government officials, and environmental professionals –-i.e. the stakeholders— who are going to work together to formulate a for IWRM plan. At this initial meeting, key concerns are identified and a workshop based on brainstorming is organized for considering focal issues. These workshops are useful to gain participation from real affected groups rather than experts such as environmentalists, businessmen, educators, managers, and industrialists (Davenport 2003, 38-39).

Once the partnership is built with the engagement of main stakeholders, it is time to provide an effective and sustainable organization. Since the partnership must support the meaningful management actions for a long time, partnership organizations are established based on full-time employees, office space and equipment, water-quality monitoring and public outreach programs, availability of water-quality information, and citizen participation interests (Davenport 2003, 41-42).

There is no fix organizational model for all water resource partnership organizations. The form and structure of a partnership organization

can change from an informal organization to more complex formal organization depending on a number of factors –such as geographic scope, resource availability, etc. Generally the structure of partnership organizations consists of five committees, as shown in Figure III.1.

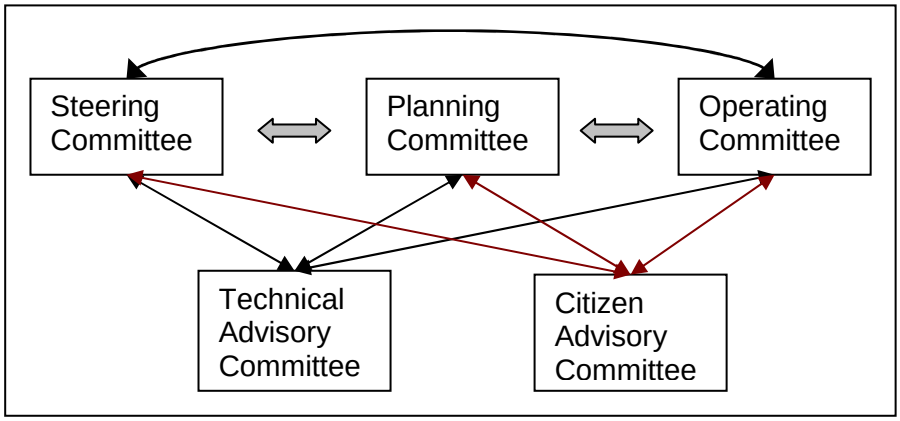


Figure III.1: Partnership Organization Structure
(Source: Formed with reference to Davenport 2003, 43)

It should be noted that the number of committees and their combinations change depending on the characteristics of the catchment level area. The roles of the above mentioned committees are described as follows (Davenport 2003, 45-49):

1. Steering Committee: This committee is also known as the management or executive committee, and provides leadership. It should be composed of a relatively small group who are

interested in the water basin, who are willing to volunteer, and who provide diversity. The committee sets project direction based on mission statement, performs overall project management, and organizes necessary activities for developing and implementing the plan. Moreover, it provides a balance of representative interests consisting of public, private-citizen-public-interest groups, public officials, and economic interest groups. The members, roles, and responsibilities of a steering committee vary depending on water-quality issues and interests of individuals.

2. Planning Committee: The planning committee usually consists of members from the steering committee and other interested organizations and agencies. There is no restriction on planning committee members. However, the members should have some abilities such as collectively representing a special interest group as well as their individual interests, serving as decision-maker in the water basin, together representing all the economic, social, and cultural communities, and representing all different views and interests in the basin. Role of planning committee is to define the purpose for IWRM planning efforts and implement partnership's planning concepts.
3. Operations Committee: The operations committee is responsible for implementation, evaluation, outreach, and monitoring. The committee establishes teams for performing each responsibility. Figure 9 highlights the administrative positions of these teams for implementations of the committee. The planning committee determines the general principles of IWRM planning, and operations committee decides the target groups and the best strategies to implement them. Moreover, it is very important for this committee to closely coordinate with TAC and planning committee for performing its responsibilities effectively.

4. Technical Advisory Committee (TAC): The TAC is a team of professionals and interested stakeholders who assess available information for making recommendation to other committees and higher authorities. It also makes recommendation about the need of additional data. After that, it suggests management strategies and approaches in order to make all members understand the purpose and goals of IWRM planning. TAC generally works with planning committee to support its determination of the planning objectives. The TAC membership usually consists of experts from nonprofit organizations, local organizations, governments, and universities.
5. Citizen Advisory Committee (CAC): The committee provides advice on various aspects of the partnership operations. The roles of CAC are to help partnership committees in developing potential solutions to problems, seeking public reaction, monitoring program implementation, and demonstrating accountability, openness, and responsiveness. Moreover, the CAC is a means of getting input and assistance to IWRM planning process by being a focal point for stakeholder participation. Partnerships should consider public hearing and informing for effective implementation of IWRM planning processes and citizen advisory committee supports it by helping them gather information, positions, and opinions; and providing an opportunity for people to involve in IWRM planning process.

Due to their coordinator roles, partnership organizations and their related committees have very crucial roles for defining the stakeholders and obtaining their participation to the IWRM planning process. They are also called as a *"public"* in the Davenport's definition because their committees are organized with the

participation of various stakeholders such as, federal government agencies, international and national environmental and conservation organization, etc. Furthermore, during the IWRM planning process, these committees organize social capacity building activities with the partnership of related stakeholders.

III.3.2. Social Capacity Building Activities

IWRM planning is about working with people to make short and long-term solutions to sustain water quality by changing their behaviors and sensations. This is only possible with social capacity building activities. These activities provide the foundation for social learning processes, in which different stakeholder perspectives and experiences are shared, considered and evaluated, in order to support behavioral change in a watershed or a river-basin within IWRM planning process. Moreover, successful social capacity building efforts raise stakeholders' awareness, knowledge, understanding and ability for their active participation in IWRM planning process. These activities help them to understand that they will have positive effects on their society and environment by actively participating in this process. There are four main tools for providing social capacity building activities: information, education, outreach program, communication plan (Davenport 2003, 203-205; Agriculture and Resource Management Council of Australia and New Zealand & Australian and New Zealand Environment and Conservation Council 1994, 9-10; Ferreyra & Beard 2007, 278).

- **Information**: Information is a powerful tool for raising awareness and empowerments. It has two parts; namely public information

and support information. Public information involves the distribution of specific information to the related community directly or indirectly. The aim is to report the facts and engages public in water related issues. It also provides the basis for people to get involved the IWRM planning process and make decisions. Sheets, public service announcements, conventional media (printed media, television, and radio), non-conventional media (messages on water bills, games, transport tickets, comic books, etc), informal meetings, exhibits, presentations, direct mail, signs, and brochures are used for this type of information. Meanwhile, support information involves specific management and technical information on targeted groups by giving them direct education and also chance for monitoring implementation. This type of information helps individuals to perform and maintain her or his IWRM planning practices more professionally (Davenport 2003, 203-204; Global Water Partnerships 2003, 111-112).

- **Education**: Education is a more practice-based process that involves the incorporation of locally relevant IWRM planning topics into pre-school, primary, middle, and high school education as well as adults training activities. Bringing water issues into schools' education programmes provides a tool for encouraging young people to understand not only the wider water concepts, but also effects on their behaviours on water, its quality and ecosystem (Global Water Partnerships 2003, 107).

  Besides the development of water-related education programs in schools, there are some training activities for adults. Adults learn very differently than children; therefore some educational

activities are organized by focusing on where the adults live in the basin and which culture they have. Another challenge is that many adults tend to be resistant to change; especially rural landowners do not want to leave their old habits and they are more resistant to change than urban residents. Therefore, the most effective education approach with adults is one-to-one contact; and the operations committee from partnership organizations is responsible with this issue (Davenport 2003, 210).

- **Outreach Programs**: The outreach program is the integration of information and education activities. Within this program, schools and universities involved, volunteer projects are held, workshops and conferences are held, successful celebrations are held, politician are invited and involved, and sponsored media is sought. In other words; the outreach projects should not be one isolated set of activities; it should be inter-connected set of small projects aimed for different audience to different issues in order to reach the overall goal (Davenport 2003, 205-206).

- **Communication Plans**: Communication plans are used to inform public about issues and events, and give them opportunity to participate in this process. They are more useful than other tools in addressing IWRM planning issues by helping to create the right environment. They provide basis for structuring, executing, and evaluating communication practices (Davenport 2003, 213-214; Global Water Partnerships 2003, 109).

For providing all of these, the communication plan includes:

- One-to-one information exchange by telephone, email and fax and exchange during social experiences, conferences, and professional meetings,
- Text materials such as newspaper, printed manual, electronic media report, bulletin board, and email chat about IWRM planning experiences,
- Interactive web-based IWRM information systems which emphasize the best management options for a catchment level, and overall management goals,
- Interactive computer-based tools –such as Geographic Information System— to communicate with agencies or targeted partners,
- Professional workshops to exchange the best IWRM planning experiences at catchment level,
- Radio broadcasts and video presentations,
- Open houses,
- Village level capacity building,
- National and regional technical and study tours allowing professionals and practitioners to exchange first hand results of IWRM planning (Global Water Partnerships 2003, 109).

The communication plans should be prepared as a broadly defined strategy at the macro level, where partnership committees make choices between proposed activities, based on expected reactions of public to IWRM plan implementations. The goals and objectives of a communication plan should provide the framework for each step of IWRM planning. The goals should reflect the expected outcome of communication efforts, and the

objectives should be measurable and specific enough to realize the activities. Moreover, the plan should give short and clear messages to gain attentions and interests. These messages should use well-known and non-technical terms in order to be understandable for all levels of the community (Davenport 2003, 214-215).

III.3.3. Staging of IWRM Planning Process

Being a holistic and strategic process, IWRM planning needs five stages at the catchment level:

1. Initiation (assessment and problem identification)
2. Planning (plan development)
3. Implementation (making a difference)
4. Evaluation (consider whether we make it or not)
5. Monitoring (consider whether we make it or not) (Davenport 2003, 13-18; Lecture notes of the course CE497 given by Atila Uras, 2006)

The stages are considered in iterative and circular approaches due to their dynamic characteristics (Figure III.2) The process is iterative because during any stage, it might be realized that the previous stage was not done properly. In addition, it is circular because new understandings and development opportunities could be improved during this process. New threats might also come into being at any stage of the IWRM planning process (Lecture notes of the course CE497 given by Atila Uras, 2006).

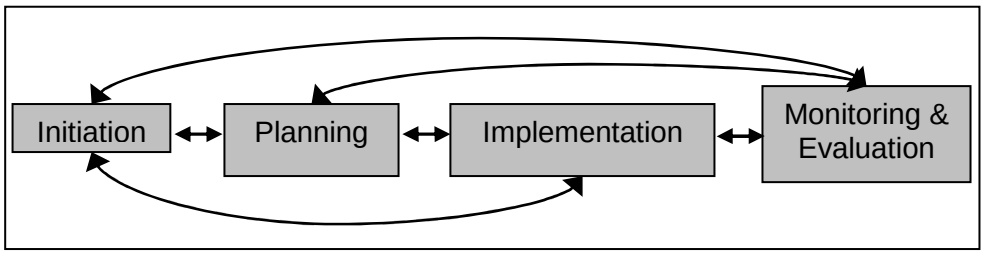


Figure III.2: Iterative and Circular Approaches of IWRM planning stages (Source: Lecture notes of the course CE497 given by Atila Uras, 2006)

1) Initiation Stage:

This stage includes assessment and problem identification that help the partnership and stakeholders to realize what is happening at the defined catchment level. In this stage, data are gathered, analyzed, and documented for problem and opportunity identification and goal definition (Davenport 2003, 61, Lecture notes of the course CE497 given by Atila Uras, 2006).

The geographic scope of the IWRM planning project is very crucial factor for assessment and problem identification, because water resources have very complex systems affecting on all natural conditions and human activities. Therefore, the water basin assessment consists of careful analysis of all water resources in the drainage basin and their stressors in order to understand what parts of the whole area are in trouble and need initial intervention. Moreover, concerns related to other natural resources, local economy, and social structure of the defined area are also be

assessed, identified and addressed for an effective IWRM planning progress (Davenport 2003, 61-62).

Initial stage is especially very important for planning stage and public participation process, because the IWRM plan needs to be based on understandable assessments with maps and supporting data, and timely manner and clear information should be available for ensuring adequate public participation (Davenport 2003, 62; Lecture notes of the course CE497 given by Atila Uras, 2006).

This stage has three main parts:

a) Assessment: This part includes identification of problems, potentials, and data gaps; and evaluation of problem categories, their geographic distribution, and causes.

   The first step of assessment is definition of the water basin by mapping it to provide a spatial context that helps partners to make assessment. Since the basin both includes water resources and all land drain into them, topographic map for area definition is the most useful. The map includes the basin boundaries, local political jurisdictions, existing infrastructure and infrastructure plans, an inventory of existing land-uses in the area, natural features, and government-protected areas (Davenport 2003, 65-67).

   The second step is conducting the inventory of available data and reviewing all existing databases on the area. The data are obtained by fist-hand interviews, review of newspapers, focus groups and citizen surveys, and using existing population,

housing, economic and agricultural census data. However, data gaps always occur due to insufficient information about the resources. Therefore, filling these data gaps is a key concern for making an effective assessment. Other key concerns are appropriateness of data, frequency of collection, data reliability, and cost of obtaining data (Davenport 2003, 63-71; Lecture notes of the course CE497 given by Atila Uras, 2006; Priority Actions Programme Regional Activity Centre Split 1997, 64).

b) Analyses: It consists of several technical analyses to understand the fundamental water ecosystem processes that depend on many different physical, chemical, and biological factors. Technical analyses also include the influences of human activities on water ecosystem processes in order to identify existing and potential problems. The three-tier analysis is the most common method. The first tier identifies all natural components of the basin. The second tier identifies the stressors that decrease the quality of the components identified in tier one. The third tier identifies the sources that contribute to the stressors. An important characteristic of three-tier method is that when inventories and problem identification are completed, credibility is established by correcting the identified problems (Davenport 2003, 71-76, Lecture notes of the course CE497 given by Atila Uras, 2006).

c) Determination of the Critical Areas: Determining and focusing on the critical area helps prioritize the concerns and actions in the basin. This is very important, because implementation of management practice in the entire basin is impossible due to its over expensiveness. Determination of critical areas help the

most effective use of resources when collecting data, making assessment, and improving and protecting water quality (Davenport 2003, 84; Lecture notes of the course CE497 given by Atila Uras, 2006).

2) Planning Stage:

The planning stage provides a road map for addressing the goals, selecting the best management alternatives and implementation approaches, defining opportunities, and determining how to measure the successes and failures. It is a continuous and systematic process that serves to provide a framework and establish necessary guidelines for decision-making and actions to address the IWRM planning goals (Davenport 2003, 91; Priority Actions Programme Regional Activity Centre Split 1997, 63).

The planning process should be long-term and systematic; otherwise, decisions become inconsistent and management becomes insufficient to serve the current needs of the basin (Davenport 2003, 91; Priority Actions Programme Regional Activity Centre Split 1997, 63).

The IWRM plan should be based on the best available assessments of natural, economic, social features of the basin. Unfortunately, the plans are generally reactive to existing problems rather than proactive for future degradations. In order to prevent future problems while addressing the existing ones, the plan should find the balance between being reactive and proactive (Davenport 2003, 91).

Through the world, In the 1960s and 1970s local and state agencies developed comprehensive plans for regional waste-treatments plants, public land-use management, and watershed or river basin conservation management. However, most of these plans were never fully implemented due to its top-down imposition without public participation (Davenport 2003, 92).

Since the early comprehensive planning approach for water resource management had implementation failures, the IWRM planning was developed based on *strategic* and *implementation* planning approach. Strategic planning sets an overall purpose and direction, and provides a guideline for all implementation activities by seeking consensus among stakeholders. Moreover, operational (implementation) planning is concerned with the formulation of detailed technical programs, policies, procedures and activities that are necessary to achieve the strategic plan (Priority Actions Programme Regional Activity Centre Split 1997, 63).

The strategic plan has two rules; the first rule is to develop the right objectives, and the second rule is to periodically revise the plan for attaining a balance between area-wide problems and subwatershed-specific problems. In addition to that, strategic plan process should be flexible and dynamic to meet changing conditions and needs. In other words, since people's need, attitudes and values changed, plans should be revised systematically to accommodate these changes. It also provides the iterative use of tools in order to maximize use of existing tools and minimize development costs (Davenport 2003, 94-95).

The IWRM planning, based on strategic and operational planning approaches, consists of three features: iterative, flexible, and dynamic. Meanwhile, the IWRM plan should be readable for a person with limited knowledge about the basin (Davenport 2003, 96-125).

3) Implementation Stage:

Implementation stage includes all activities that are necessary to execute goals and objectives of the IWRM plan. Human and financial resources are the key elements for supporting the implementation activities. The partnership's operation committee is responsible for organization of the activities and maintenance of resources to organize them. This committee organizes activities according to the plan schedule with the aim of providing visible results. Therefore, the public and stakeholders see results and they begin to be interested and involved more (Davenport 2003, 129-130; Torkil 2004, 22; Priority Actions Programme Regional Activity Centre Split 1997, 35).

Volunteers should be very effective if they assist with implementation, because several implementation activities are done by volunteer organizations. However, using volunteers in these activities is not costless. Training, equipment, transportation, and insurance need money. Therefore, after plan goals, needs and alternatives are identified systematically, funds for implementation should be looked for. These funds are generally taken from state or local governments, non-government organizations, and private institutions (Davenport 2003, 139; Priority Actions Programme Regional Activity Centre Split 1997, 35).

In reality, there are several obstacles in implementation of IWRM plans. Weak financial support is the main obstacle (International Water Association & United Nations Environmental Programme 2002, 32-36). The other ones are listed below:

- Division of institutional responsibilities. Water resources consist of various activities – agriculture, industry, urbanization, etc—. Since these activities are planned and managed separately by different government institutions, implementation remains insufficient.
- Complexity of IWRM planning concepts. Since IWRM is a new approach for water management planning, it could be difficult to understand its system and characteristics. Therefore, the IWRM plan clearly defines how its goals and objectives are implemented by multiple actions. In addition, it also clearly identifies the vision and its reflection at the catchment level because the stakeholders, especially catchment level ones, cannot predict what kinds of social and economical improvements occurred in the area when this plan is implemented.
- Need for lessons learnt from reference projects. Although there is no universally applicable rule for IWRM plans due to the particular characteristics of the water resources, there is a need of providing a knowledge base from experiences of previous projects. A sufficient knowledge base is lacking and there are few strategies and models to move from theory to practice. Therefore, lessons should be learnt from reference projects, and general principles for implementation should be defined depending on the failures and successes of the previous projects.
- Lack of adequate skills, expertise and awareness. Most developing countries lack sufficient skilled human resources for

implementation of IWRM plan at the catchment level. Moreover, in developed countries, governments still have very little capacity installation for managing and implementing the required reforms of IWRM plans. Therefore, universities and research institutions, in both developing and developed countries, should pay more attention to education and training of people, who are supposed to implement the strategies of the IWRM plan.

- Lack of adequate and reliable data. IWRM planning is rationally and effectively implemented if consistent and reliable data are available for all water-related issues. Data gaps effect on the successful implementations of IWRM planning, and they generally result from lack of access to existing data. Government agencies protect their data too much and access is denied to stakeholders and other institutions, even though the data are public domain information and publicly-funded. Moreover, there is lack of clear definition and assessment about the data that are necessary for planning and implementing the IWRM strategies. Therefore, more attentions should be paid universally to obtain and assess the relevant data for IWRM planning strategies.

4) Monitoring and Evaluation Stage:

Monitoring is a process of collecting information and making measurements about many characteristics of the waterbody and its area according to specific quality assurance and control protocols. Moreover, it also evaluates whether the IWRM planning efforts operate depending on these monitoring efforts (Davenport 2003, 143,163; Agriculture and Resource Management Council of Australia and New Zealand & Australian and New Zealand Environment and

Conservation Council 1998, 17-18; WWF-Turkey & Ministry of Environment and Forestry 2004, 43).

Monitoring plays an important role to link management activities with funders, decision-makers, and stakeholders, and to gain their supports. It also allows partnership to build on success, learn from mistakes, and modify implementation approach (Davenport 2003, 141-143,163-164; WWF-Turkey & Ministry of Environment and Forestry 2004, 43).

Four types of evaluation and monitoring methods are used in order to evaluate IWRM efforts accurately (Davenport 2003, 144-165; WWF-Turkey & Ministry of Environment and Forestry 2004, 43):

a) Formative Type (Prior): It is utilized to understand target groups and ecosystems before the IWRM planning project is implemented. It includes test approaches, materials, and ideas.
b) Process Evaluation and Monitoring (During): It focuses on tracking of activities and expenditures during implementation stage and providing timely information to the steering committee, partnerships and stakeholders about the process. It also helps the partnerships correct the mistakes, eliminate redundancy, and test progress toward pollution control objectives.
c) Outcome Evaluation and Monitoring (Afterward): It measures short-term results of the IWRM planning project. It can be used to measure changes in knowledge, attitudes, skills and behaviours; determine if the project has worked within the desired time frame; and determine if the project goes beyond the desired effects. If the change in environmental conditions and human behaviours in the short-run influences on all the project area and also around of

it, this implies IWRM planning efforts are going in a right direction and they could be successful in the long-run.

d) Impact Evaluation and Monitoring (Much Later): It measures long-term effects of IWRM planning efforts. It is the most difficult type of evaluation to complete because needs and expectations of stakeholders may change in the long-run.

Figure III.3 shows the relationship between the phases of evaluation and monitoring explained above. In addition, Table III.3 shows the reasons and purpose of monitoring activities in the IWRM planning.

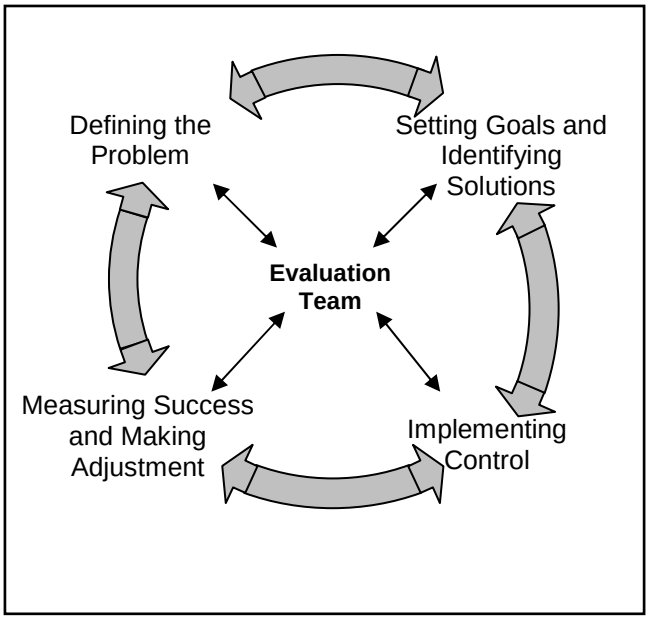


Figure III.3 Four Evaluation Type and Their Phase
(Source: Davenport 2003, 155)

Table III.3: Reasons and Purpose of Monitoring in Different Stages of the IWRM Planning

IWRM Planning Phase	Why	Monitoring Purpose
Initiation Stage	Establish baseline; determine trends in water quality	Condition and problem investigation monitoring
Planning Stage	Establish goals and objectives; fill data gaps	Condition and problem investigation monitoring
Implementation Stage	Track progress; use trend analysis to detect directional changes	Compliance and condition monitoring
Evaluation Stage	Determine trends and impacts; need for midcourse corrections	Condition and problem investigation monitoring

(Source: Davenport 2003, 168)

There are some barriers that block the success of evaluation process. Lack of knowledge is the most important one. It results from lack of adequate baseline, an incomplete monitoring scheme, lack of money and inadequate data collection and analysis. The other barriers are:

- Most of the time, experts try to answers the questions that some of the stakeholders think that it is important to ask
- The evaluation report often arrives after the IWRM planning program is completed.
- Evaluations are usually directed to the wrong people.
- Evaluations change as much as implementation approaches (Davenport 2003, 149-150).

CHAPTER IV

INTEGRATED WATER RESOURCE MANAGEMENT PLANNING PRACTICES IN THE WORLD

This chapter aims at displaying some best practices of the IWRM planning from the world; and the reflection of the “lesson learnt” on the theory of the IWRM planning. Furthermore, this chapter is to assist in understanding the “how Turkey has been influenced from the IWRM planning practices realized in different countries”.

From this point of view, this chapter examines the Murray-Darling Basin Management Plan (Australia) and Yangtze Basin Management Plan (China) as case studies from the world, because they are considered successful IWRM planning practices and used in the education activities of this kind of planning efforts in Turkey. Besides, their water and soil characteristics and planning processes resemble the Konya Closed Basin (WWF, http://www.panda.org/about_wwf/what_we_do/freshwater/, accessed on August, 2008; WWF-Turkey 2004b, 10-13).

IV.1. Murray-Darling Basin Management Plan, Australia

IV.1.1. Characteristics of the Basin

Murray- Darling basin is one of the greater river basins of the world, which locates in the southeast of Australia (Figure IV.1). It occupies one million square kilometers of the country –one seventh of Australia—through twenty major rivers which transverse slowly westward across thousands of kilometers. The basin has relatively low rainfall and very high evaporation; therefore, the natural accumulation of salts in the landscape is occurred. Moreover, since the mountains around the basin prevent the water resources from reaching the sea, either water or salt can get out of the basin; and the basin allows discharge of either water or salt. All these situations create salinity problem in the basin (Lawson 2005, 68-69; Alsharhan & Wood 2003, 141-143; McNally & Tognetti 2002, 20).

The basin is regarded as Australia's food bowl with its forty percent of the total agricultural production of the nation, including 75% of the irrigated production and provides water to 20% of the nation's population. It also contains about half the national cropland and three quarters of irrigated land, while draining only 14% of the country's land area (Lawson 2005, 65; Alsharhan & Wood 2003, 143; McNally & Tognetti 2002, 20).

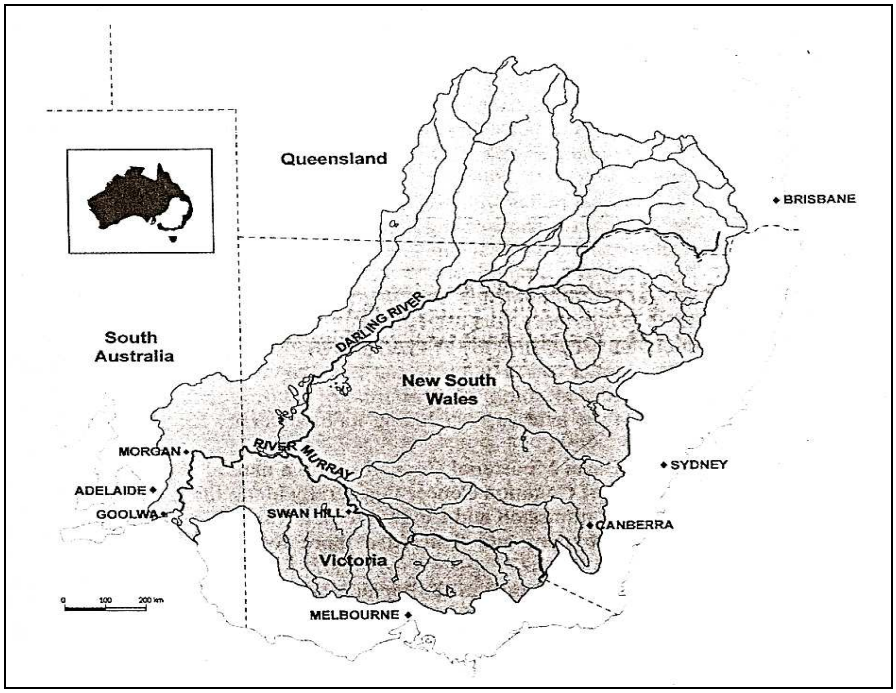


Figure IV.1: Map of Murray-Darling Basin (Source: Lawson 2005, 68)

However, the basin has several environmental problems due to the over pressures of human activities on land and water resources. These problems are primarily water shortages, as most of the water was diverted for irrigation, and a decline in water quality from a build-up of nutrients, chemicals and salinity. As a result, native fisheries and water bird populations have been collapsing and major wetlands have been disappearing. In addition, pastoralists also observe a sharp decline in their productivity (McNally & Tognetti 2002, 20).

IV.1.2. Management and Planning Process of the Basin

Within the basin, there are various stakeholder groups with competing demands for the scarce water resources for irrigation, dryland, farming, grazing, fishing, forestry, mining, electricity generation, manufacturing, tourism, and recreation and national parks activities. However, there was no agreement between these stakeholders; and also there were not intersectoral and intergovernmental relationships between institutions in order to solve the problems of the basin (McNally & Tognetti 2002, 20; Lawson 2005, 65).

In order to solve the management and planning defects, **Murray-Darling Basin Ministerial Council** was established in 1988, which took over the leadership from the bureaucratic *River Murray Commission* that had coordinated dam construction and water sharing facilities since 1914. This new council consists of water, land and environment experts of the federal government and four states of the Australian Capital Territory and more than 200 local government bodies. The aim of the Council is sustainability of basin's water quality, monitoring and controlling of land-use activities, maintenance of land resources, and definition of holistic management and planning policies in order to protect natural balance of the basin (WWF-Turkey 2004, 10; Lawson 2005, 67-68; Alsharhan & Wood 2003, 146; McNally & Tognetti 2002, 20).

The Council was then enlarged by including the ministers of nature conservation, resources and agriculture; and by electing an independent, authoritative chair for the council as a facilitator between different interest groups. Furthermore, an *Advisory*

Committee was established with 21 representatives from key stakeholders. For twenty years, these key stakeholder groups have worked together without ignoring any conflicts; generated a better understanding of each other's concerns; and facilitated decisions (WWF-Turkey 2004, 10; McNally & Tognetti 2002, 20).

There is also a *Steering Committee* in the Murray-Darling Basin Ministerial Council, where each participant from the States has different responsibilities about different issues. In other words, in this committee, there are two representatives from each state responsible for land, water and environmental issues (WWF-Turkey 2004, 10).

The responsibilities of Steering Committee are:

- Controlling of water distribution to the States with respect to the principles of the Council,
- Implementation of resource management strategies through the basin,
- Monitoring and controlling Murray Lake's water quality,
- Coordination of land-use and environmental management plans with participation of related stakeholders,
- Supporting land-use, water quality and wastewater treatment plan implementations in the basin by coordinating the river authorities,
- Obtaining an intersectoral and intergovernmental coordination in the planning process,
- Monitoring related implementation activities in the basin (WWF-Turkey 2004, 10).

In 1990, *Natural Resource Management Strategy* was adopted by the Murray-Darling Basin Ministerial Council after a four-year process. This strategy has two basic issues. The first one is the philosophy of **integrated catchment management** that recognize the linkages between various biophysical processes, which affect or are affected by water, its movement and it uses. The second one is the **project partnership** –community or government— recognizing that the basin's natural resources cannot be protected by isolating party working. This strategy also outlines resource management objectives for land, water and other environmental resources, and cultural heritage. Moreover, it defines comprehensive responsibilities for governments, communities, NGOs, the Murray-Darling Basin Steering Committee, and the Murray-Darling Basin Advisory Committee. It also contains necessary actions to implement the strategy that include the development and implementation of community-based action plans for improving on-ground management (MacDonald & Young 2001, 50-51).

Following the Strategy, the *Basin Sustainability Plan* was prepared in 1996 in order to focus on the development of programs required to accelerate the implementation of the 1990 Natural Resource Management Strategy. Then, the objectives of the plan were reviewed and updated in 1999 in the direction of the Council's studies about the development a new *Integrated Catchment Framework* for the basin for the period 2001-2010. This plan contains long-term productivity and resource condition objectives for sustainable agriculture, water quality, nature conservation and cultural heritage. For each of these priority area, specific objectives, which are designed to show short-term achievements (empowerment), medium-term achievements (implementation) and

long-term achievements (resource condition), are applied to irrigated and dryland of the basin and also its river sub-basin (MacDonald & Young 2001, 51-52).

Furthermore, in the direction of planning efforts, some implementation activities, general about infrastructure system and market of water, were realized in the priority areas. These activities have led to the adoption of more efficient water transport networks, a switch to higher valued crops and slowing of irrigation induced salinity. Moreover, salinity trading schemes have been introduced, but they have a long way to go before they halt and reverse salinity problems. Meanwhile, many difficult decisions are still discussed in the Council. For example, deforestation of hundreds of thousands of hectares each year continues in the two states despite the fact that deforestation exacerbates salinity (McNally & Tognetti 2002, 20).

IV.2. Yangtze Basin Management Plan, China

IV.2.1. Characteristics of the Basin

The Yantze River is the largest river in China and the third longest river in the world with its 6300 km length (Figure IV.2). Its basin covers 1.8 million km² areas that include several plateaus, mountains, hilly areas, plains, rivers, lakes, and wetlands. The river and the floodplain wetlands that are fed by the river undergo extremely seasonal changes. During the summer rainy season, the swollen waters of the Yangtze flow into the surrounding lake basins, while during winter and spring, when water levels are low, the lakes drain back into the river. Fish and animals have adapted to these changes and – under natural conditions – move freely among areas connected by

seasonal flooding (WWF-Turkey 2004, 12; WWF, http://www.panda.org/about_wwf/what_we_do/freshwater/, accessed on August, 2008; Nakamura 2000, 5).

The Yangtze basin has a population of 411 million –one-third of China's population— which live in the borders of eleven provinces. Because its alluvial soil is so fertile that it permits two harvests per year. Moreover, in the lower reaches of the river, the abundance of flat land and water has facilitated the growth of densely populated and heavily industrialized cities. The central Yangtze is known as China's "home of rice and fish" (WWF, http://assets.panda.org/downloads/mrwyangtzecasestudy.pdf, accessed on August, 2008; WWF-Turkey 2004, 12).

The basin has also two biggest freshwater lakes – Dongting Lake and Poyang Lake— and together with the river's vast floodplains, these lakes provide habitat for some 300 bird species, including internationally protected migratory waterbirds such as cranes and storks. The lakes and adjacent floodplains are home to two species of freshwater dolphins, more than 80 other mammal species, 200 species of fish, more than 60 species of amphibians, and around 90 species of reptiles (WWF, http://assets.panda.org/downloads/mrwyangtzecasestudy.pdf, accessed on August, 2008; WWF-China, http://www.wwfchina.org/english/loca.php?loca=91, accessed on August, 2008).

Figure IV.2: Map of Yangtze Basin (Source: WWF, http://assets.panda.org/downloads/mrwyangtzecasestudy.pdf, accessed on August, 2008)

Since the 1950s, China's population has more than doubled, with the main concentrations of people located along major river valleys. This creates great pressure on the Yangtze floodplain ecosystem, with conversion to farmland having greatly reduced the ability of the floodplain, rivers and lakes to buffer flood peaks. The loss of functional floodplains, combined with deforestation in the watershed, has led to serious flood events over the past several decades. In addition, intensive land conversion —building of dams, dykes and polders— over 50 years has caused to turn the wetlands to agricultural and residential areas. This has disrupted natural processes and fragmented habitats, endangering species such as Yangtze dolphin, Yangtze alligator and Chinese sturgeon. It also affects fishery activities by decreasing their production by 75 %

(Coca Cola Company, http://www.thecoca-colacompany.com/citizenship/pdf/watersheds_fact_sheet.pdf, accessed on August, 2008; WWF, http://assets.panda.org/downloads/mrwyangtzecasestudy.pdf, accessed on August, 2008; WWF-China, http://www.wwfchina.org/english/loca.php?loca=91, accessed on August, 2008). The other problems of the basin are:

- Natural flows and cut lakes off from the river system due to dam constructions
- Loss of natural wetland functions due to fragmentation and degradation
- Upstream erosion leading to accelerated downstream siltation
- Lack of knowledge about wetland functions and values among decision-makers
- Failure of development and land-use policies
- Institutional conflicts

(Coca Cola Company, http://www.thecoca-colacompany.com/citizenship/pdf/watersheds_fact_sheet.pdf, accessed on August, 2008; WWF, http://assets.panda.org/downloads/mrwyangtzecasestudy.pdf, accessed on August, 2008).

IV.2.2. Management and Planning Process of the Basin

Besides the increasing threats, the management of the Yangtze River in China is very complicated and involves various central government sectors, provincial and municipal governments. Although government has established some river basin wide coordination institutions –Yangtze Resource Conservancy Commission, Yangtze

Fishery Resource Management Commission, Yangtze Navigation Commission and Yangtze Valley Water Resource Protection Bureau—these institutions very much focused on the interest of a single sector, which results in narrow-minded management. The two major gaps were: 1) the lack of a systematic comprehensive river basin plan, which should, from the perspective of national strategic development, set the river basin conservation objectives and call for action by all related parties, and 2) the lack of effective collaboration and cooperation mechanisms among various governmental departments due to the current sector-oriented river basin management, and a high degree of centralization. The parallel functioning of two sets of planning and implementing systems caused inconsistency and conflicts on the ground. There was an urgent need to develop an Integrated River Basin Management (IRBM) Strategy and its Management Committee in the Yangtze Basin, which should cover the common vision, objectives, goals and targets. Therefore, in 2002, **"Integrated River Basin Management Task Force"** was established by the Chinese government for the wise management of natural resources, ecosystems and biodiversity with the participation of all stakeholders by increasing their awareness with capacity building activities (WWF-Turkey 2004, 12; Vemula, Hamid, Kaplan, Phiromchai, Price, Lei, Yu 2004, 2)

The Integrated River Basin Management (IRBM) Task Force has six national and six international members that are experts in different related issues, and their responsibilities are:

1) Assessment of existing laws and regulations about river basin management and making suggestions to related decision makers;

2) Evaluation of all IWRM practices in the world and then preparation of a report for national and local authority;
3) Development of economical tools such as water rights, water pricing, incentives, indemnity, etc;
4) Increasing of public awareness and capacity for their participation to the planning process;
5) Organization of meetings for stakeholder involvement
6) Organization of education activities and communication plans for capacity building (WWF-Turkey 2004, 12)

From this perspective, IWRM Planning Strategy, which includes restoration and ecotourism activities at the Dongting Lake and IRBM of Poyang Lake basin, was prepared in 2003 with the partnership of WWF-International and participation of several other stakeholders (WWF, http://assets.panda.org/downloads/mrwyangtzecasestudy.pdf, accessed on August, 2008).

This planning process has also the following specific objectives:

- Restore the Dongting Lake and its wetlands within ten years and manage the area in terms of sustainability
- Habitats for wetland biodiversity and livelihood opportunities for local people.
- Establish ecotourism in the Dongting Lake region as one means of supporting wetland restoration and protection.
- Demonstrate integrated coordination and management of the Poyang Lake basin.
- Restore the natural connections between Zhangdu Lake and the Yangtze River.

- Facilitate the establishment of an effective Integrated River Basin Management Committee to restore a ”Living Yangtze” (WWF, http://assets.panda.org/downloads/mrwyangtzecasestudy.pdf, accessed on August, 2008)

IV.3. Inferences from The Cases

- IWRM planning requires an integrated, holistic, and strategic approach, based on a clear vision and agreement on the values—natural, social and economic—to be conserved and the sustainable livehoods needed by the people of the basin
- Effective partnership building —establishment of a basin committee— is an essential ingredient of IWRM planning and enables far more to be accomplished than working partial and alone
- Long-term and sustained efforts are needed to raise public awareness and to gain the support of local communities
- It is necessary to work simultaneously at multiple levels —catchment level, national level and basin level— in order to realize an effective IWRM planning process
- Basin Management Plans must be prepared as a most suitable tool of sustainable development
- Effective and sustained implementation of basin scale solutions depends on governments, the corporate sector, civil society, communities and individuals accepting and committing to the principles of IWRM Planning

(WWF-Turkey 2004, 6-13; WWF, http://www.panda.org/about_wwf/what_we_do/freshwater/, accessed on August, 2008)

In conclusion, these IWRM planning practices are successful examples: Establishment of a *“basin committee”* represents *“holistic, participatory and systematic”* principles of IWRM planning. Moreover, definition of responsibilities of the basin committee with related laws and regulation represents *“goal-orientation and strategy”* principles of this planning approach. Realization of planning process *at the catchment level with the participation of related stakeholders* also represents an important principle of the IWRM planning.

CHAPTER V

WATER RESOURCE MANAGEMENT PLANNING IN TURKEY

V.1. General Conditions of Water Resources in Turkey

According to the report of the General Directorate of State Hydraulic Works[2] (2005), Turkey has 112 billion m³ exploitable water potential per year. 98 billion m³ out of this potential is surface water, while the rest (14 billion m³ per year) is underground water (See Table V.1). Therefore, if Turkey's population is accepted around 70 billion, the country has 1430 m³ annual water per capita, while the world average is 7600 m³ per capita (See Table V.2). However, this does not indicate that Turkey is a water-scarce country, because the term "water-scarce" refers to those countries which have less than 1000 m³ annual water per capita. Still, the situation in Turkey is not very optimistic, because the country's annual per capita water is much lower than the "water-rich" countries, where the annual amount of per capita water is 8000 m³. Moreover, the per capita amount has been decreasing since 1960. As a result, it is predicted that Turkey will become one of the water-scarce countries until 2030 (See Figure V.1).

[2] Devlet Su İşleri Genel Müdürlüğü (DSİ)

Table V.1: Water Resource Potential of Turkey in 2004

Water Resource	Annual Average Rain Fall(mm)	Water Quantity (billion m^3/year)	Gross Water Potential (billion m^3/year)	Technical and Economic Exploitable Water Potential (billion m^3/year)
Ground Water			**193**	**98**
Boundary	646	501	186	95
Transboundary			7	3
Underground Water			**41**	**14**
Total			**234**	**112**

Source: The State Planning Organization[3] 2007, 122)

Table V.2: Annual Water Per Capita in Turkey in Comparison to The Continental and World Averages in 2004

Places	Water Per Capita (annual)
Syria	1200 m^3
Lebanon	1300 m^3
Turkey	**1430 m^3**
Iraq	2020 m^3
Average of Asia	3000 m^3
Average of Western Europe	5000 m^3
Average of Africa	7000 m^3
Average of South America	23000 m^3
World Average	**7600 m^3**

(Source: WWF Turkey 2008, 15)

[3] Devlet Planlama Teşkilatı (DPT)

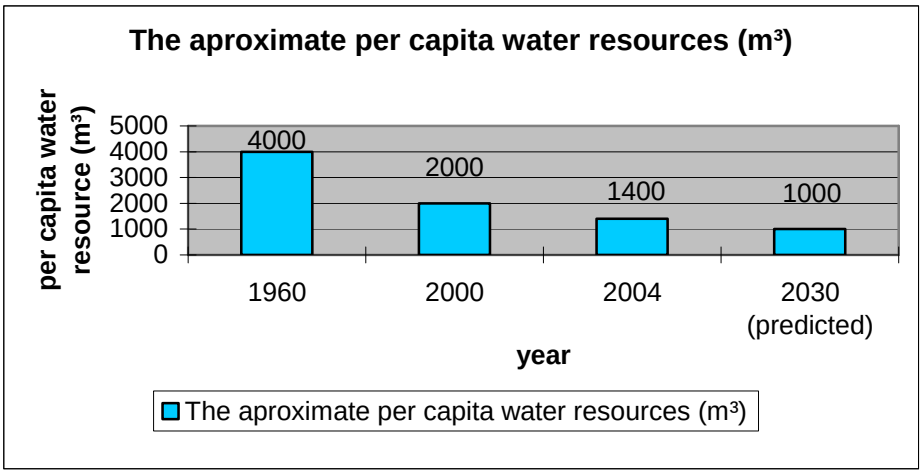


Figure V.1: Approximate Annual Per Capita Water Resources in Turkey (Source: Burak 2007, 10)

Obviously, the increasing population leads to the expansion of urban areas, which puts more pressure on water resources by exceeding their natural carrying capacities. Burak mentions that annual water demand has increased from 30.6 billion m^3 to 40.16 billion m^3 since 1990 and it will increase up to 112 billion m^3 until 2030. This means that if water demand keeps increasing, water resource potential of Turkey will be finished up in 2030 (See Figure V.2).

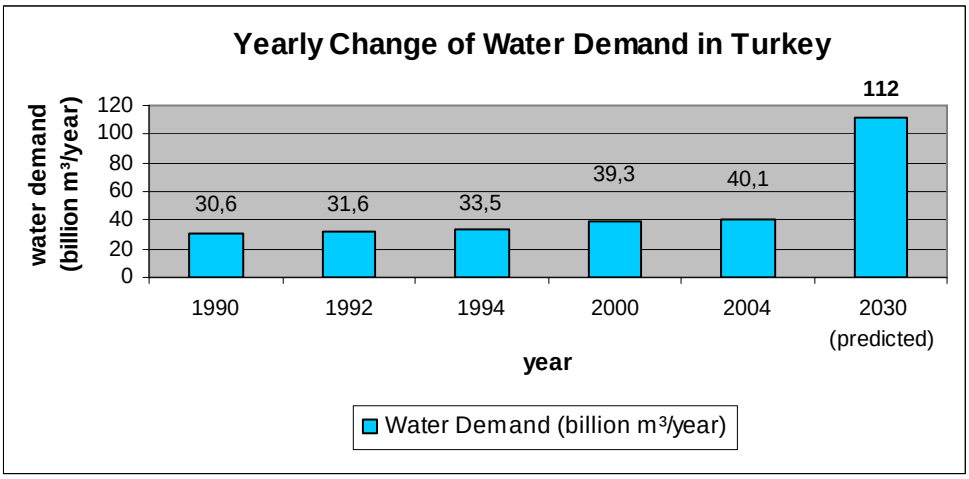


Figure V.2: Annual Changes of Water Demand in Turkey
(Source: Burak 2007, 11)

Experts of WWF-Turkey claim that the major reason of that situation is insufficient planning of sectoral water use. According to the Report of General Directorate of State Hydraulic Works (2005), the agricultural sector has been the major consumer of water resources in Turkey for years with a share of 73 % of the entire use. The domestic use is around 15 %, whereas the industrial use is around 11 % (See Figure V.3). Agriculture comes into the picture as the most exploiting sector due to inconvenient irrigation and drainage systems. It should be mentioned that water resources have been over-consumed for domestic purposes, too, because of the inefficient infrastructure systems that cause the loss of 50 % of the water distributed to houses (WWF Turkey 2007a, 4). Meanwhile, the industrial sector causes pollution of water resources with insufficient water treatment systems. According to the questionnaires of Turkish

Statistical Institute[4], in 2004, only 16 Industrial Organization Zones[5] out of 58 have wastewater treatment systems (WWF Turkey 2008, 16).

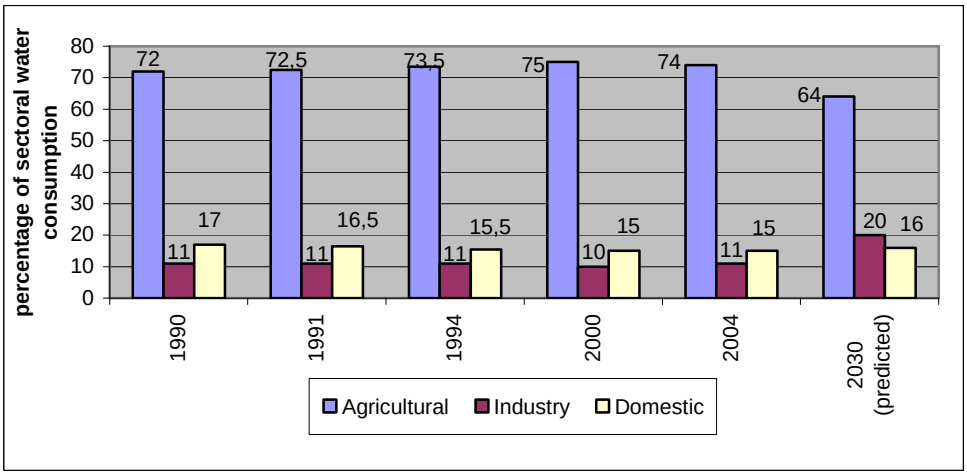


Figure V.3: Annual Sectoral Water Consumption in Turkey (%)
(Burak 2007, p.12)

It should be noted that, water-related problems have started crucially effecting on people's daily life for last two years in Turkey. According to the report of Turkish Chamber of City Planners (2007), the percentage of water-related diseases in Turkey has increased since 2006 because of the insufficient treatment of drinking waters. The main reason of this situation is the drought and pollution of water resources. For two years, in big cities –especially Ankara, İzmir, İstanbul, existing drinking water resources have not been able to

[4] Türkiye İstatistik Kurumu (TUİK)
[5] Organize Sanayi Bölgesi (OSB)

meet the water demands of population; therefore, new infrastructure systems have been constructed in order to transfer drinking water from other water-basins. However, the water transferred from other basins is too polluted to be a drinking water; and the treatment systems of in these cities do not have enough technology to treat the transferred water. Since people lived in these cities—especially children— are under the risk of infection by water-born diseases, the consumption of packaged drinking water has increased. Moreover, the water cuts, which have been scheduled frequently since 2007 due to the incomplete drinking water infrastructure construction activities, have decreased the quality of life. As a result of these, the advertisements about careful use of waters –such as advertisement films, billboards, posters, internet sites, e-mail groups, etc— have increased observably for the last two years; and the wise-use of water resources has become the main issue in the meetings of related NGOs, the governmental institutions and professional chambers (Chamber of City Planners, http://www.spo.org.tr, accessed on November, 2008; Tüm Gazeteler, http://www.tumgazeteler.com, accessed on November, 2008)

V.2. Water Related Institutions and Legislations of Turkey

To overcome the water resource problems mentioned previous subject, 14 governmental and several non-governmental institutions were established in Turkey from the 1970s onwards. These institutions are responsible for planning-investment or monitoring of water resources with their related laws and regulations (See the list of the institutions on Table V.3 and detailed information in Appendix I and Appendix II). Turkey also participated in several international water related conferences and signed various conventions (See the

list of conferences and conventions on Table V.3 and detailed information in Appendix III).

Table V.3: Water Related Institutions, Organizations, Legislation in Turkey together with Participated International Conferences and Signed Agreements

Governmental Institutions[6]	Non-Governmental Institutions[7]	National Laws, Rules and Regulations[8]	International Conferences	International Agreements[9]
• **The Ministry of the Environment and Forestry** *The Turkish State Meteorological Service *General Directorate of State Hydraulic Works *Environmental Protection Agency for Special Areas • **The Ministry of Health** • **The Ministry of Public Works** *The Bank of Provinces • **The State Planning Organization** • **The Ministry of Agriculture and Village Affairs** •	• **WWF Turkey: World Wild Fund for Nature** • **Doğa Derneği** • **United Nations Development Program** • **Local Non-governmental Institutions** • **Union of Chambers of Turkish Engineers and Architects** *All Professional Chambers in the Union • **Universities**	• **Environmental Law** (no 2872) • **Law about Underground Waters** (no 167) • **Law on Municipalities** (No 1580, 3030, 5272 and 5216) • **Agricultural Reform Law** (No 3083) • **Water Products Law** (No 1380) • **Public Sanitation Law** (No 1593) • **Regulation on the Protection of Waters against Pollution Caused by Nitrates from Agricultural Sources** (18.02.2004) • **Environmental Impact Assessment Regulation** (16.12.2004)	• **1977** United Nations Conferences on Water • **1987** United Nations World Commission on Environment and Development • **1992** United Nations Conference on Environment and Development • **1992** International Conference on Water and the Environment • **2000** Second World Water Forum (Millennium Council and Millennium Development Strategies)	• **RAMSAR Convention** (1971/1994) • **Bern Convention** (1984) • **Convention on Biological Diversity** (1996) • **UN Framework Convention on Climate Change (UNFCCC)** (2005) • **Global Environment Facility (GEF)** (1991) • **Global Water Partnership** (1996) • **Water Framework Directive (WFD)** (2000/60/EC)

[6] See detail information in Appendix I
[7] See detail information in Appendix I
[8] See detail information in Appendix II
[9] See detail information in Appendix III

Table V.3 (continued)

• **The Ministry of Energy and National Resources** *General Directorate of Mineral Research and Exploration *General Directorate of Electrical Power Resources Survey and Development Administration • **The Ministry of Culture and Tourism** • **The Ministry of Foreign Affairs** • **Secretariat General for EU Affairs** • **Turkish Statistical Institute** • **Local Municipalities**		• **Water Pollution Control Regulation** (30.12.2004) • **Regulation on Water Intended for Human Consumption** (17.02.2005) • **Watershed Protection Regulations** (17.05.2005) • **Surface Water Quality Regulation for Drinking Water** (20.11.2005) • **Regulation on the Control of Pollution Caused by Dangerous Substances Discharged in the Aquatic Environment** (26.11.2005) • **Urban Wastewater Treatment Regulation** (08.01.2006)	• **2002** The World Summit on Sustainable Development	

(Source: Onur 2003, 32-41; Dıvrak 2008, 159; Özbay 2007, 23-27; the State Planning Organization 2007, 56; WWF Turkey 2007a, 9; Burak 2007, 12; Çiçek 2007)

Table V.4: Water-Related Laws and Regulations in Turkey in Chronological Order[10]

Laws and Regulations	Date	Focused Issues
Laws about Waters	May 10, 1926	Distributing and collecting the water for public good
Laws on Municipalities (No1580)	April 4, 1930	Controlling the serving of the residents' common needs such as drinking water, irrigation water, sanitation, etc.
Public Sanitation Law	April 24, 1930	Defining the sanitation rules, especially in water infrastructure systems
Laws about underground waters	December 23, 1960	Controlling the using, researching and protecting of underground water resources as a public good
Water Products Law	April 4, 1971	Defining the rules about protection, production and controlling of water products
Environmental Law	August 8, 1983	Protecting the environment in terms of sustainable environment and sustainable development concepts
Laws on Greater Municipalities (No.3030)	June 27, 1984	Arranging legal perspectives of greater municipalities in order to obtain planned, effective and suitable services such as drinking water and wastewater infrastructure, solid waste collection, environment health, etc.
Agricultural Reform Law	December 1, 1984	Organizing the agricultural activities in order to increase effectiveness of the fields
Urban Wastewater Treatment Regulation	January 8, 2004	Defining principles of collecting, refining and discharging of urban wastewaters and also protection of environment against the impacts of industrial wastewater discharges

[10] See detail information in Appendix II

Table V.4 (continued)

Regulation on the Protection of Waters against Pollution Caused by Nitrates from Agricultural Sources	February 18, 2004	Analyzing, defining and preventing water pollution caused by nitrate from agricultural sources
Laws on Greater Municipalities (No.5216)	July 10, 2004	Arranging legal perspectives of greater municipalities and also controlling plans and programmes of the services in order to make them more effective, efficient and active in the framework of new planning, development and technical concepts
Laws on Municipalities (No5272)	December 7, 2004	Defining the working methods and responsibilities of municipalities active in the framework of new planning, development and technical concepts
Environmental Impact Assessment Regulation	December 16, 2004	Organizing the technical and administrative rules and principles of Environment Impact Assessment
Water Pollution Control Regulation	December 31, 2004	Defining the technical and legal perspectives of water pollution prevention in order to protect all ground and underground water resources in terms of sustainable development concept
Regulation on Water Intended for Human Consumption	February 17, 2005	Defining the principles of sanitation quality standards of waters resources for human consumption
Watershed Protection Regulation	May 17, 2005	Defining the watershed area protection and development principles in terms of RAMSAR Convention
Surface Water Quality Regulation for Drinking Water	November 20, 2005	Defining drinking water quality and treatment principles
Regulation on the Control of Pollution caused by Dangerous Substances in Aquatic Environment	November 26, 2005	Defining, controlling and decreasing the impacts of dangerous substances on water resources

According to Table V.4, before 1983, all laws were prepared in terms of the **“public good”** approach. In other words, controlling of water resources was considered important especially for the *well being of people*. However, after 1983, with the impact of the Brundtland Report, **“nature protection”** and **“sustainability”** concepts came into the agenda of related Turkish legislation because it is realized that conservation of natural resources is not only important for human beings, but also for sustainability of the environment and the future generations. Therefore, since 1983, all laws and regulations have been prepared with respect to these concepts in order to provide a *balance between development and protection*.

Mrs. Sezer Göktan, one of the coordinators of the Tuz Lake Management Planning Project, and Mr. Mustafa Özgür Berke, one of the experts of the Konya Closed Basin IWRM planning process, mention that these laws and regulations are legally bounding; if related institutions do not implement them, there are financial and technical fines for them. However, these laws and regulations only apply to the **“point”** conservation level; and do not have a sustainable approach since there is not a holistic legal and administrative structure related to water resources in Turkey.

Meanwhile, the international agreements signed by Turkey emphasize the *international coordination* of sustainable development and conservation issues. Among them, GEF, GWP and WFD have more comprehensive contexts. In other words, they consist of all the dimensions related to the management planning and conservation of water resources; while the others only include one aspect of water management planning.

With regard to these international agreements, Turkey prepared several laws and regulations such as Environmental Law, Environmental Impact Assessment Regulation, Watershed Protection Regulation, etc. Mr. Berke and Mrs. Göktan mention that the laws and regulations enacted with respect to these agreements have a crucial role for the development of water management planning approach in Turkey. The agreements are legally bounding (i.e. there are financial fines for disobedience) where they are adopted.

Although the water related institutional and legal systems in Turkey have been gradually improved since the 1960s, there are still some problems in water resource management and planning activities due to *unclear distribution of roles and responsibilities between these institutions*. In addition, the related laws and regulations give all responsibilities to the government, i.e. they do not mention any public participation in water resource management planning. There is also lack of information exchange between governmental institutions, NGOs and water users (WWF Turkey 2007a, 9; Onur 2003, 41-42).

V.3. A Brief History and Evaluation of the Water-Basin Management Planning in Turkey

Taking care of the related legislation and agreements, several regional plans have been prepared and implemented in Turkey since the 1960s under the coordination of relevant governmental institutions. The primary aim of these plans has been development of Turkey depending on economical and social events and they have included development and management of water resources due to their economic and social significance.

These plans generally seem to be the components of five management and planning types:

- National Development Plan (Five-Year Development Plan)[11]
- Regional Development Plan[12]
- Rural Development Plan[13]
- Water-Basin Master Plan
- Water-Basin Management Plan (Watershed Management Plan) (See Table V.5).

[11] Beş Yıllık Kalkınma Planı
[12] Bölgesel Kalkınma Planı
[13] Kırsal Kalkınma Planı

Table V.5: Chronological Order of Regional Planning Types of Turkey that are Related to Water Resource Management

National Development Plan	Regional Development Plan	Rural Development Plan	Water-Basin Master Plan	Water-Basin Management Plan
▪ 1st Five-Year Development Plan (1963-1967) ▪ 2nd Five-Year Development Plan (1968-1972) ▪ 3rd Five Year Development Plan (1973-1977) ▪ 4th Five Year Development Plan (1979-1983) ▪ 5th Five Year Development Plan (1985-1989) ▪ 6th Five Year Development Plan (1990-1994) ▪ 7th Five Year Development Plan (1996-2000) ▪ 8th Five Year Development Plan (2001-2005) ▪ 9th Five Year	▪ Köyceğiz-Dalaman Project (1958) ▪ Antalya Plan (1959-1965) ▪ Çukurova Region Planning Project (1962-63, 1987) ▪ East Marmara Planning Project (1960-1964) ▪ Zonguldak Regional Plan (1964-1968) ▪ Ege Region Development Plan (1963-1969) ▪ Keban Plan (1964-1968) ▪ South-East Anatolian Project (GAP) (1989) ▪ East Black Sea Development Plan (DOKAP) (mid 1990s-2002) ▪ Zonguldak-Bartın-Karabük Regional	▪ Çorum-Çankırı Rural Development Project (1974-1984) ▪ Erzurum Rural Development Project (1982-1988) ▪ Bingöl-Muş Rural Development Project (1983-1988) ▪ Yozgat Rural Development Project (1991-2001) ▪ Ordu-Giresun Rural Development Project (1995-2006) ▪ Erzincan-Sivas Rural Development Project (2004)	▪ Fırat Basin Management Plan (1966) ▪ Çoruh Basin Management Plan (1969) ▪ West Black Sea Basin Management Plan (1969) ▪ Dicle Basin Management Plan (1971) (General Directorate of State Hydraulic Works prepared water-basin master plan for 25 water-basin of Turkey; but there is no information about their time-period)	▪ Köyceğiz-Dalyan Management Plan (1991) ▪ Göksu Delta Management Plan (1999) ▪ Manyas Lake Management Plan (2001) ▪ Beyşehir Lake Management Plan (2001-…) ▪ Uluabat Lake Management Plan (2002) ▪ Bafa Lake Management Plan (2002) ▪ Sapanca Lake Management Plan (2003-….) ▪ Tuz Lake Management Plan (2004-2006) ▪ Akşehir-Eber Management Plan (2005-2007) ▪ Burdur Lake Management Plan (2005-….) ▪ Meriç-Ergene

Table V.5: Continued

Development Plan (2007-2013)	Development Projects (1995-1997) ▪ East Anatolian Development Plan (DAP) (1998) ▪ Yeşilırmak Basin Development Project (1998-2006) ▪ Marmara Regional Plan (2000) ▪ Konya Plain Project (KOP) (2008)			Management Plan (2006) ▪ Gediz Delta Management Plan (2006) ▪ Fırtına Valley Management Plan (2006) ▪ Kızılırmak Delta Management Plan (2006-2007) ▪ Eğirdir Lake Management Plan (2006-….) ▪ Akgül Lake- Ereğli Marshes Management Plan (2006-….) ▪ Yumurtalık Lagoon Management Plan (2007) ▪ Sultansazlığı Management Plan (2008)

(Source: İKTİSAD 2007, 1-7; ACAR 2006, 7-16; Poroy 2004, 12; State Planning Organization, http://ekutup.dpt.gov.tr/bolgesel/strateji/UKKS.pdf, accessed on September, 2008; WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ accessed in April, 2008; Bird Research Society, http://www.kad.org.tr/eski/yumurtalikpr.htm accessed in April, 2008; WWF Turkey 2007b, 1-6; Gürpınar 2008, 61-70; Doğa Derneği, http://www.dogadernegi.org/ accessed in April, 2008;Altunbaş 2006, 30-42;
Çınar Mühendislik, http://www.cinarmuhendislik.com/ accessed in April, 2008; Environmental Protection Agency for Special Areas, http://www.ockkb.gov.tr/tr/ accessed in April, 2008;Ministry of Enviroment and Forestry, http://www.burdur-cevreorman.gov.tr/ accessed in April, 2008; Göktan 2008, 79-82; WWF Turkey 2006a, 2-3; WWF Turkey 2008a, 30-37;İstanbul University 2005, 1-11; WWF Turkey 2008a, 33; Yılmaz 2008, 29-36; WWF Turkey 2006b, 4-5; Uras 2008, 119-124; Lecture notes of Ayda Eraydın)

National Development Plans are the five-year development plans that have been prepared by The State Planning Organization since 1963. The aim of these plans is to achieve economic and social development in Turkey by minimizing the regional inequalities. Therefore, “regional planning” is one of the crucial issues in these plans and “development and management of water resources” have came to forefront due to their multidimensional roles for economic and social development (Keleş 2004,398-409; Köroğlu & Ölmez 2003, 85-87; Kılıç 2004, 67-73; İKTİSAD 2007, 1-7).

Regional Development Plans have been prepared since 1958 in order to develop the regions, which have had different potentials and problems, both economically and socially. After 1963, these plans have been prepared with reference to the national development plans. In some of these plans, water-basin scale was adopted for the organization of water resource systems by using engineering methods. These are Keban Plan, South East Anatolian Project, East Black Sea Development Plan, East Anatolian Development Plan and Yeşilırmak Basin Development Project. However, these plans did not coincide to the exact boundaries of a water-basin, because the primary aims of these plans were social and economic development of the regions. Therefore, the planning scale was identified depending on social and economic criteria. Therefore, it can be inferred that these plans were not water resource management plans. Water resource systems were organized and managed only for social and economic purposes (Keleş 2004, 385-393; Köroğlu & Ölmez 2003, 83-84; Kurt 2003, 75-79; Kılıç 2004, 67-73; Kentsel Araştırma Gönüllüleri, http://www.kentli.org/makale/orcun_bolge.htm, accessed on September, 2008; Acar 2006, 7-8).

Rural Development Plans are the small-scale regional plans that have been prepared for 34 years in order to improve rural areas in economic and social terms. Since economic development of the rural areas depend on agricultural activities, management of water resources for irrigation became one of the crucial aims of these plans. As a result, water management projects were prepared in order to determine the quantity of water resources and their capacity for agricultural activities. These projects also determined the land-use activities in terms of agricultural purposes. However, all of these water resource management efforts were based on technical calculations and inferences; and they were far from the social and environmental issues. Hence, they could not serve people's needs and also could not protect water resources and their ecosystems (Keleş 2004, 409-414; Demokratik Düşünce Platformu, http://www.stratejikboyut.com/article_detail.php?id=64, accessed on September, 2008; Acar 2006, 8-16; State Planning Organization, http://ekutup.dpt.gov.tr/bolgesel/strateji/UKKS.pdf, accessed on September, 2008).

Water-Basin Master Plans are the water-basin management plans that have been prepared since 1954 by the General Directorate of State Hydraulic Works in order to use water potentials and basins of a region with respect to a plan, while meeting different water demands necessary for social and economic development. According to Salim Fakıoğlu, who is the vice-chairman of First Region Research Planning Department of General Directorate of State Hydraulic Works, these plans consist of technical calculations to understand "which water basin has what quantity of water, and what amount of this quantity can be used for economic and social activities". In other words, they have been prepared for determination

of the potential and capacity of water resources to meet different demands of the society –domestic, industrial, irrigation, and energy production activities. They also include land-use decisions related to water consumption level; however these decisions are made based on engineering calculations. Moreover, although some of these plans are prepared with reference to national, regional and rural development plans; the boundaries of the plans and land-use decisions generally do not take care of these regional planning types.

Water-Basin Management Plans are the water resource management plans that have been prepared since the 1990s through the collaboration of several institutions and participation of different stakeholders. These plans have a complex planning process in which land-use plans; urban improvement plans for nature protection and watershed management plans are combined. However, the plans are generally approved as a *'watershed management plan'* in the watershed scale due to inadequate legal and administrative frameworks of Turkey. Sometimes, these plans are also approved as a *'landuse plan'* or an *'urban improvement plans for nature protection'*.

The planning studies can be divided into three main periods with respect to their water resource management approaches (Demokratik Düşünce Platform, http://www.stratejikboyut.com/article_detail.php?id=64, accessed on September, 2008):

1. **1923-1963** (The period between the foundation of Republic of Turkey and establishment of State Planning Organization)
2. **1963-1999** (The period between the establishment of State Planning Organization and the Helsinki Summit Meeting)
3. **1999 onwards** (From the Helsinki Summit Meeting onwards)

Between 1923 and 1963, the regional planning studies were started with the Köyceğiz-Dalaman Project in 1958. Before then, no noteworthy regional planning studies had been realized due to the critical international economic and political conditions during and after the Second World War (Lecture notes of Ayda Eraydın). Çukurova Regional Planning Project (1962) and Antalya Planning Project (1960-1965) followed this study. All of these plans were prepared to solve the development problem of critical regions. The only water-basin related activity in these plans was *'Investigation Report of Antalya Basin (1960)'*, which consisted of investigation, planning and implementation stages related to the water and land resources of the region. Moreover, the most important event of this period is establishment of the General Directorate of State Hydraulic Works in 1953 with the aim of development and management of water resources in order to meet different water demands. Besides this aim, the General Directorate of State Hydraulic Works has also worked on flood prevention and dried wetlands for 55 years. In this time period, this institution started to prepare several water-basin projects –investigation report of Antalya basin was one of these projects—; but could not finish none of them during this time period.

Between 1963 and 1999, after the establishment of State Planning Organization (SPO), Turkey made progress about regional planning. In the National Development Plans prepared by SPO, the issues of

regional planning, rural development, and environmental development have been discussed for years. As a result of the studies on "Urban Hierarchical Order"[14], Turkey was divided into 16 sub-planning regions (See Figure V.4). However, although most of the planning studies covered those regions, actually there were no regional planning attempts within the exact boundaries of those regions, except for a few numbers of academic studies. As Mrs. Eraydın mentioned, all the regional planning studies in the period were carried out in order to adapt the urban and rural areas to the crucial impacts of economical and social events. In this perspective, this period can be divided into four sub-periods:

a) **Between 1963-1969 (Regional Plans for Efficient Use of Resources):** This period was called as "the planned period" because putting the growth process into discipline was supposed to be necessary in order to avoid negative impacts of economical changes. In this perspective, in the First Five-Year National Development Plan, the "regional planning" was described as *"The plan that defines the natural resources and their efficient use, helps the proper use of land and determines and schedules the public activities that are needed".* In the meantime, three groups of regions were defined with respect to the general policies of this national development plan: potential development regions, less developed regions, and metropolitan regions. However, this new planning approach developed in this period and institutionalisation of national development planning caused some discussions. Although all of these discussions took place in official documents, there occurred little effort to institutionalise this aspect of planning. Moreover, the import substitution policies in this period

[14] Kentsel Kademelenme

caused the acceleration of rural-to-urban migration and rapid urbanization. This situation created the problems of squatter housing and informal economy. As a result of these, although the regional development plans for Eastern Marmara, Antalya, Çukurova, Zonguldak, and Keban were prepared during the 1960s, they had found limited chance of implementation (Lecture notes of Ayda Eraydın).

b) **Between 1971-1977 (Economic Incentives for Supporting Disadvantaged Areas and Economic Assistance to Manufacturing Projects):** The regional policies were changed in this period; and private entrepreneurship became important for economical development. Taking care of these new policies, "regional development" concept was redefined as *"a cooperative effort of defining natural resources of regions and supporting the most advantageous fields of activity in these areas*". The regional planning approach was changed as a result of this new perspective and lack of administrative capacity and institutionalisation to implement the regional development plans. The use of the word "region" was refrained in national development plan documents, instead, the word "determined areas" were used. Moreover, most of the urban and rural areas lost their importance due to over migration to abroad. As a result of these, no noteworthy regional development plans were prepared in this period (Lecture notes of Ayda Eraydın).

c) **Between 1981-1990 (Regional Policies for Increasing Export Capacity):** In this period, the huge rate of inflation, lack of foreign reserves and increasing unemployment caused to the change of economic and industrialization model. Import substitution model was abandoned in favour of export oriented growth. As a result of this new approach, the regions having higher manufacturing

capacity developed rapidly. This situation differentiated the regions as those with increasing export capacity and services directed to export activities, and the others still looking for domestic market. İstanbul and İzmir became the centres of exports activities and migration flows. Some cities such as Denizli, Gaziantep and Çorum developed more rapidly than others due to their manufacturing potentials and export activities. Moreover, Southeastern Anatolia became a centre of attention for preparing an integrated regional plan. The project focused on economic development based on increasing agricultural potential of the region by the completion of irrigation projects, while paying less attention to socio-spatial issues. However, some less developed areas like Eastern Anatolia were unlucky in terms of natural resources. In those regions the volume of public sector investment was not enough for regional development in the new economic system. This is an important indicator of why regional planning is necessary for these areas. Meanwhile, investments were directed to the tourism sector in the 1980s. So, some tourism projects for metropolitan and southern coastal areas were prepared; and they led to a tendency of agglomeration at coastal areas. As a result of the all events happened in this period, Southeastern Anatolia Project and some rural development plans were prepared in the 1980s. Preparation of a development plan for Eastern Anatolia was started to be considered (Lecture notes of Ayda Eraydın).

d) **Between 1995-1999 (Reform for Recovery and Stabilisation):** In this period, economic problems and decline in income per capita severely affected on the less developed regions. This situation brought the regional discrepancies on the agenda. Beginning from 1998, the regional plans were prepared for

Eastern Black Sea Region and Eastern Anatolia Region. Since these regions have relatively few resources, the development plans would put strong emphasis on public investment programs in order to increase public resources and productive activities. This approach also led to the revision of the Southeastern Anatolia Project. The revision process included local agents and civic organizations in defining basic principles and priority areas (Lecture notes of Ayda Eraydın).

Most of these planning studies were coordinated by more than one partner – such as Zonguldak Project, Çukurova Project, Antalya Project, South Eastern Anatolia Project, Eastern Anatolia Development Plan, Eastern Black Sea Development Plan and Zonguldak-Bartın-Karabük Regional Development Project. However, only for the three of them—Zonguldak Project, South Eastern Anatolia Project, and Eastern Black Sea Development Plan—regional unions were established for implementation and evaluation activities; and only the regional union established for South Eastern Anatolia Project has institutional and legal framework. Therefore, the other associations could not implement the plans properly due to their insufficient authorities (Keleş 2004, 385-409; Kentsel Araştırma Gönüllüleri, http://www.kentli.org/makale/orcun_bolge.htm, accessed on September, 2008; State Planning Organization (SPO), http://ekutup.dpt.gov.tr/bolgesel/strateji/UKKS.pdf, accessed on September, 2008; Köroğlu & Ölmez 2003, 80-91; Kılıç 2004, 67-73)

Figure V.4. Regional Development Plans Prepared in Turkey Between 1963 and 1999 (drawn with reference to The State Planning Organization, http://www.dpt.gov.tr, accessed on October, 2008 and Kılıç 2004, 68-69)

Moreover, in this period, the *water-basin* was used as the planning scale of a regional development plan for the first time. This plan is the **Keban Project** that was prepared by the SPO and Ministry of Public Works in 1964. The aim of the project was planning the basin created by the Keban Dam, which covered the provinces of Malatya, Elazığ, Tunceli and Bingöl. Besides, the project also aimed at controlling the opportunities and weaknesses related to the Dam and the area. However, the boundaries of the plan could not exactly cover the Keban Dam Basin; it was drawn with respect to the administrative boundaries, because the aim of the water-basin planning effort was merely the social and economical development of the region, it did not consisted of protection of water resources and other habitats. The plan could not be implemented because a responsible regional institution was not established in the Keban Basin. In addition, although the Eastern Anatolia Development Plan (DAP in its Turkish abbreviation), which was prepared in the following

years, covered the area of the Keban Project; the planning decisions and experiences of Keban Project could not be used in this development plan (Kentsel Araştırma Gönüllüleri, http://www.kentli.org/makale/orcun_bolge.htm, accessed on September 18, 2008; Keleş 2004, 389-390).

Between 1963 and 1999, the other important regional planning effort about water resource management was the **South Eastern Anatolia Project (GAP in its Turkish abbreviation)** that was prepared in 1989 by the SPO. The plan was a kind of '*integrated regional plan'* that organized transportation, urban and rural infrastructure systems, education, health, residential, tourism, agricultural and industrial activities of the region, while developing its water resource systems. The main goal of the plan was the organization of rivers' natural water flows by constructing water storage and infrastructure systems in order to enhance agricultural activities for the economic development of the region. For this purpose, the General Directorate of State Hydraulic Works prepared water-basin master plans for the Euphrates and Tigris Basins. The most important aspect of this plan was that in 1989, the first *'regional development administration*[15]*'* in Turkey was established for the South Eastern Anatolia with the name of *'South Eastern Anatolia Regional Development Administration* [16]*'.* The role of this administration was provision of inter-sectoral coordination, and capacity and finance buildings that were necessary for the implementation of the project. As a result of all these planning efforts, there is an obvious economical improvement in the region that has been observed since 1989; however, in the recent years, it has been also observed that the fertility of the soil has decreased

[15] Bölgesel Kalkınma Yönetimi
[16] GAP Bölge Kalkınma İdaresi Başkanlığı

and some parts of the region have become arid due to over irrigation activities and chemical pesticides. This is the result of unsustainable water management and regional planning activities (Kurt 2003, 76; Keleş 2004, 390-393; The State Planning Organization, http://www.dpt.gov.tr, accessed on October, 2008; Kentsel Araştırma Gönüllüleri, http://www.kentli.org/makale/orcun_bolge.htm, accessed on September, 2008).

Starting with the South Eastern Anatolia Project, similar regional development plans were prepared for other regions of Turkey in this period. These were Eastern Anatolia Development Plan and Eastern Black Sea Development Plan. However, for the implementation and evaluation of these plans, the regional development administrations were not established; only informal municipality associations were organized. Moreover, critical environmental results of these plans have been still discussed by various experts (Kurt 2003, 76; Keleş 2004, 390-393; The State Planning Organization, http://www.dpt.gov.tr, accessed on October, 2008; Kentsel Araştırma Gönüllüleri, http://www.kentli.org/makale/orcun_bolge.htm, accessed on September, 2008).

After 1999, with the Helsinki Summit Meeting, Turkey became an accession country for the European Union (EU), and accordingly, started the harmonization process with the Acquits of the EU. The related studies in the field of regional development changed the development approach and the scale of regional planning in Turkey. Social and economic development issues have been connected to the sustainability of natural resources, especially wise-use of water resources. In 2002, the State Planning Organization and Turkish

Statistical Institute grouped the settlements at three levels (NUTS[17]) with reference to the EU requirements, taking care of social and economical criteria: NUTS1 (12 Regions), NUTS2 (26 Regions) and NUTS3 (81 Regions). Then, the State Planning Organization decided to prepare regional plans at the NUTS2 scale (See Figure V.5) (Kayasü & Yaşar 2006, 10; The State Planning Organization, http://www.dpt.gov.tr, accessed on September, 2008).

It is planning to prepare the following planning processes for the NUTS2 regions, when the regional development agencies would have relevant authorities for the preparation of a regional plan[18]:

- T82: Çankırı, Kastamonu, Sinop
- TR83: Amasya, Çorum, Samsun, Tokat (Yeşilırmak Basin Development Plan)
- TRA1: Bayburt, Erzincan, Erzurum
- TRA2: Ağrı, Ardahan, Iğdır, Kars
- TR72: Kayseri, Sivas, Yozgat
- TR52: Konya, Karaman
- TRB1: Bingöl, Elazığ, Malatya, Tunceli (Kayasü & Yaşar 2006, 11)

However, According to Prof. Dr. Ayda Eraydın, the borders of NUTS2 areas have not been defined exactly because there are lots of discussions and critics about the definition of these areas; and actually the European Unions asked for a revision study about NUTS2 regions.

[17] Nomenclature of Units for Territorial Statistics (İstatistiki Bölge Birimleri Sınıflandırması)
[18] The colored parts in Figure V.5 shows where the regional planning studies have been carried out

Figure V.5. NUTS2 Regions of Turkey and Prepared Development Plans in Terms of Them (drawn with reference to The State Planning Organization, http://www.dpt.gov.tr, accessed on September, 2008)

Actually, among these planning studies, **Yeşilırmak Basin Development Plan** was prepared in 2006 and it has a crucial importance in terms of regional planning and water resource management, because it is the first regional development plan called as a '**basin development plan'** and it is also the only completed plan that was prepared according to the EU criteria. According to Mr. Akın Atauz, who is the coordinator planner of Yeşilırmak Basin Development Plan, although this plan has several aims related to water resource management such as organization of water flows, controlling erosion, decreasing water pollution, and encouraging economical use of water resources. The primary aim of the plan is social and economic development of the region. The plan scale was also identified with regard to this aim, not merely taking care of the physical boundaries of the Yeşilırmak Basin. Depending on these inferences, Mr. Atauz mentions that this plan is not a water-basin

development plan; it is actually *'TR83 Regional Plan'*. However, the plan could pioneer to other IWRM studies in Turkey with its multi-partner approach, strategic and systematic characteristics.

Another important step within the harmonization process is the establishment of *'Regional Development Agencies*[19]*'* throughout the 'Regulation about establishment, coordination and responsibilities of regional development agencies' enacted on January 25, 2005. Establishment of a regional institution in the regional planning areas is very important for the implementation and evaluation of the plans. However, in Turkey, until 1999, only the *'South Eastern Anatolia Regional Development Administration'* had been established as a regional institution responsible for implementation of the South Eastern Anatolia Development Plan. The other regional development plans could not be implemented adequately due to the lack of a responsible regional institution. As a result of this, the studies for establishment of regional development agencies were started in 1990s. These were:

- Aegean Region: Aegean Foundation of Economic Development (EGEV),
- Adana: Adana Development Alliance Foundation[20] (AGV) and Center for Research and Development of Adana[21] (AYAGEM),
- Mersin: The Council of Mersin Development and Co-operation[22] (MEKIK),
- Samsun: The Council of Samsun Regional Economic Development[23] (SABEKAK),

[19] Bölgesel Kalkınma Ajansları
[20] Adana Güçbirliği Vakfı
[21] Adana Yatırımları Araştırma ve Geliştirme Merkezi
[22] Mersin Kalkınma ve İşbirliği Konseyi

- West Mediterranean: The Foundation for The Economic Development of Western Mediterranean[24] (BAGEV) covering the provinces of Antalya, Burdur and Isparta
- Kelkit Basin: Kelkit Platform formed by provinces and districts in the Kelkit basin (The State Planning Organization, http://www.dpt.gov.tr/program/2007i.pdf, accessed on October, 2008; Kayasü & Yaşar 2006, 11-15)

However, these agencies do not have the authority to implement and evaluate a development plan. They only have the responsibilities for organization of activities related to the economic and social development of a region. Therefore, in 2005, establishment of regional development agencies in NUTS2 regions was decided depending on regulation about establishment, coordination and responsibilities of regional development agencies in order to organize and control regional development activities. With this purpose, *İzmir Development Agency* and *Çukurova Development Agency* were established in 2006; but Mr. Atauz mentions that since these agencies were established in the regions which do not have regional development plans, they do not exactly know what their functions and responsibilities are. Moreover, the related regulation does not give them the authority to prepare, implement and evaluate a regional plan. In addition to that, in the TR83 region, which is the only NUTS2 region having regional development plan, there is no regional development agency for implementation activities. Only *'Yeşilırmak Basin Development Association'* was organized with the participation of related municipalities and governorships; and it could be active only the decision making process. Therefore, the Yeşilırmak Basin

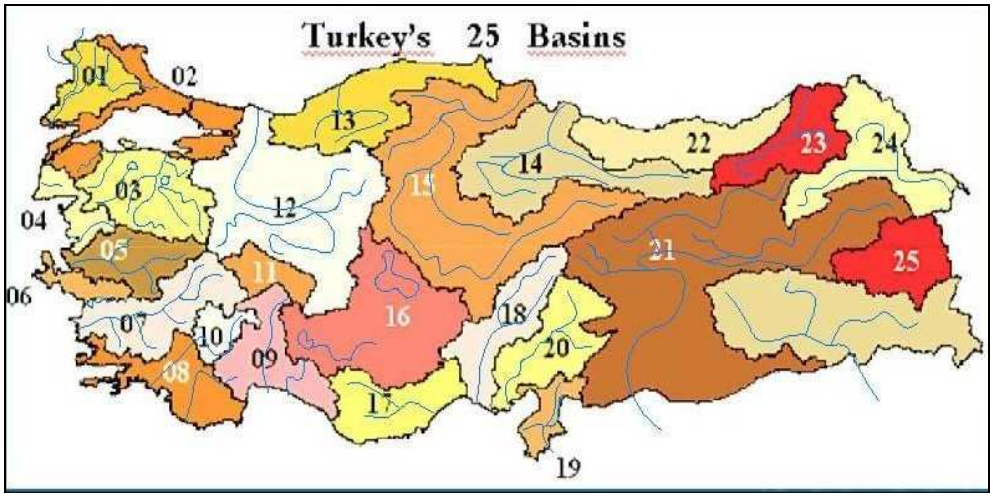
[23] Samsun Bölgesel Ekonomik Kalkınma Konseyi
[24] Batı Akdeniz Ekonomisi Geliştirme Vakfı

Development Plan could not be implemented and evaluated due to the lack of institutional and legal authority for organization of these activities (Kayasü & Yaşar 2006, 10-15; Poroy 2004, 11)

Moreover, within the harmonization process as an accession country for the EU, the concept of *'sustainable development and nature conservation'* came into the agenda of Turkey. This concept implies the preparation of plans for wise-use of water resources. In recent years, the water resources in Turkey, which have crucial roles on regional development, have met drought and quality-decrease problems. Therefore, a different water resource management system was adopted as a regional planning approach by the collaboration of non-governmental organizations. Then, the governmental institutions, especially the General Directorate of State Hydraulic Works, started to support this new planning approach by being the stakeholder — generally leading partner— of these plans.

This new planning approach is the '*water-basin management planning'* that particularly pays attention to *public participation* and *integrated approach*. It is also supposed to provide a balance between development and protection (WWF Turkey 2007a, 9). In these kinds of plans, *water basin scale* was accepted as the planning scale for the first time, and 25 basins were defined in Turkey with reference to main rivers (See Figure V.8). In the preparation and implementation processes of these plans, governmental institutions and non-governmental institutions worked together and local people were informed about the projects. However, these kinds of projects do not still have a clear legal and institutional framework. Therefore, they have remained as small-scale projects. These projects were not prepared with regard to a holistic water resource management

planning approach, although Turkey needs a national water management policy in order to protect and use water resources in a sustainable manner (Dıvrak 2008, 165; WWF Turkey 2007a, 8-9).



01 Meriç-Ergene Basin	**09** Antalya Basin	**17** East Mediterranean Basin
02 Marmara Basin	**10** Burdur Lakes Basin	**18** Seyhan Basin
03 Susurluk Basin	**11** Akarçay Basin	**19** Asi Basin
04 North Aegean Basin	**12** Sakarya Basin	**20** Ceyhan Basin
05 Gediz Basin	**13** West Black Sea Basin	**21** Euphrates-Tigris Basin
06 Küçük Menderes Basin	**14** Yeşilırmak Basin	**22** East Black Sea Basin
07 Büyük Menderes Basin	**15** Kızılırmak Basin	**23** Çoruh Basin
08 West Mediterranean Basin	**16 Konya Closed Basin**	**24** Aras Basin
		25 Van Lake Basin

Figure V.6: 25 Water-Basins of Turkey (Source: Prepared with the reference to Burak 2007, 7)

The water-basin management plans listed below are the examples of river-basin scale implementations in Turkey:

- Meriç-Ergene Basin Management Plan/ **Meriç-Ergene Basin**
- Manyas Lake Management Plan & Uluabat Lake Management Plan/**Susurluk Basin**
- Gediz Delta Management Plan/**Gediz Basin**
- Bafa Lake Management Plan/**Büyük Menderes Basin**
- Köyceğiz-Dalyan Management Plan & Eğirdir Lake Management Plan/**Antalya Basin**
- Burdur Lake Management Plan/ **Burdur Lake Basin**
- Akşehir-Eber Management Plan/**Akarçay Basin**
- Sapanca Lake Management Plan/ **Sakarya Basin**
- Sultansazlığı Management Plan & Kızılırmak Delta Management Plan/**Kızılırmak Basin**
- Tuz Lake Management Plan, Beyşehir Lake Management Plan, Akgöl Management Plan/ **Konya Closed Basin**
- Göksu Delta Management Plan/**East Mediterranean Basin**
- Yumurtalık Lagoon Management Plan/**Ceyhan Basin**
- Euphrates-Tigris Basin Management Plan/ **Euphrates-Tigris Basin**
- Fırtına Valley Management Plan/ **East Black Sea Basin**

Table V.6 summarizes these management plans with reference to integrated water resource management planning criteria and principles.

Table V.6: Evaluation of The Water-Basin Management Plans in Turkey

Place	Problems	Aims	Coordinator (Partner)	Participant (Other Stakeholder)	Social Capacity Building Activities	Planning Activities	Implementation Activities	Success (According to coordinators of the plans)
Uluabat Lake Management Plan (MP) (Susurluk Basin)	• Increase of water pollution due to industrial and agricultural activities • Decrease of fishery activities	• Decrease of water pollution in Uluabat Lake • Maintenance of fishery activities • Wise-use of natural resources • Increasing public awareness about the problems of the area and management activities	• Ministry of Environment and Forestry • WWF-Turkey • General Directorate of State Hydraulic Works • Uludağ University	• Industrialist • Farmers • Fishermen • Agenda 21 of the Bursa Municipality • ÇEKÜL • Tophane Rotary Club • Association of Architects • Gölyazı Rural Areas Union	• Public hearing meetings • Organization of meetings for information exchange between partners • Organization of meetings for stakeholders involvement	• Uluabat Lake Management Plan was prepared in 2002 with the participation of related governmental and non-governmental institutions, universities, private institutions and public. • Small scale projects are still being prepared by the Bursa Watershed Commission	• Construction of Çınarcık Dam by General Directorate of State Hydraulic Works • Closure of some industrial plants due to their unsuitable conditions in terms of wise-use of water resources • Change of land-use activities with respect to the management plan	• First **"watershed management plan"** experience of Turkey • Pioneer of other water resource management plans • Establishing of "National Watershed Committee" and "Local Watershed Committee" by the coordination of the Ministry of Environment and Forestry

Table V.6 (continued)

Uluabat Lake MP (Susurluk Basin)								• Preparation of "Watershed Protection Regulation" • Organization of economic activities in the basin • Increasing local people's capacity and awareness
Meriç-Ergene MP (Meriç-Ergene Basin)	• Pollution of Ergene River due to industrial activities • Threats on the soil quality of Ergene Basin for agricultural activities	• Solving the environmental problems of Meriç-Ergene Basin in an integrated perspective • Controlling all economic activities for the sustainability of the	• Ministry of Environment and Forestry • Trakya University • WWF-Turkey • Agenda 21 of Çorlu Municipality	• Industrialist • Farmer • Association of Industrialist • Trakya Development Union	• Organization of a meeting with the • participation of WWF-Turkey and Agenda 21 of Çorlu Municipality • A public hearing meeting with the participation	• Regional plans at the scales of 1/400000, 1/250000, 1/100000 and 1/25000 were prepared. • Action plans at river-basin scale were prepared • Plan reports, implementation	• Two wastewater treatment systems are still under construction • Preparation of Environment Impact Assessment for implementation projects	• Controlling economic activities in the basin • Increasing the awareness of local people and decision makers about the management of the basin

Table V.6 (continued)

Meriç-Ergene MP (Meriç-Ergene Basin)	• Not controlling of industrial wastes	basin • Increasing public awareness about natural resource protection			of Ministry of Environment and Forestry, Association of Manufacturer, and Trakya Development Union	principles and plan synthesis report were also written. • Projects were started to be implemented on September 9, 2006		• Controlling wastes in terms of sustainability concept
Manyas Lake MP (Susurluk Basin)	• Decrease of bird number • Deteriorati on of water quality in Manyas Lake • Threat of water pollution	• Improvemen t of Manyas Lake water quality • Managemen t of the water resource with respect to its natural conditions • Developmen t of mechanisms for wise-use of the area	• LIFE Third Countries Program • Ministry of Environment and Forestry • WWF-Turkey	• Farmers • Fishermen	• There is no information about social capacity building activities	• Manyas Lake Basin Wastewater and Solid Waste Management Plan has been prepared since 2001 and the plan is not finished yet • Manyas Lake Management Plan is going to be prepared by WWF-Turkey as a river-	• Preparation of 'ecological risk analyses' • Extension of 'National Park' border as it covers Manyas Lake sub-basin • Construction of monitoring systems on Natural Park Visitor Center	•Establishment of "Lake Management Committee"; it has not a formal committee due to insufficient legal and administrative frameworks

Table V.6 (continued)

						basin scale plan of Susurluk Basin Management Plan.		
Gediz Delta MP (Gediz Basin)	• Increase of water pollution due to industrial and agricultural activities • Decrease of agricultural fertility • Decrease of forests	• Decrease of water pollution on Gediz River • Wise-use of natural resources	• Ministry of Environment and Forestry • Ege Wild Life Protection Association • Doğa Derneği • Ege University • Izmir Institute of Technology	• Industrialist • Farmers • Agenda 21 of İzmir Municipality	• Organization of meetings for information exchange between partners • Organization of meetings for stakeholders involvement	• Gediz Delta Tourism Plan was prepared with the participation of related governmental and non-governmental institutions and municipalities • Gediz Delta Management Plan was prepared in 2006.	• There is no information about the implementation activities of the plan	• Increasing the awareness of local people and decision makers about the management of the basin

Table V.6 (continued)

Bafa Lake MP (Büyük Mende-res Basin)	• Increase of salinity due to water level decrease • Decaying of plants into the water • Threats of high water pollution	• Solving the problems of Bafa Lake by preparing a managemen t plan in Büyük Menderes Basin scale • Decrease of pollution in Bafa Lake	• Ministry of Environment and Forestry • General Directorate of State Hydraulic Works • WWF-Turkey • ECODOSD - a kind of NGO	• Farmers • Fishermen • Workers of tourism sector • Industrialist	• Organization of meetings for information exchange between partners and stakeholders • Education programs about wise irrigation system, sustainable agriculture, drip irrigation techniques and water-agriculture-environment relation	• Büyükmen-deres Basin Management Plan was started to be prepared in 2002 • An international platform was achieved • Information was exchanged between Turkey and Holland. • A brochure was prepared for explanation of plan implementation.	• Studies of General Directorate of State Hydraulic Works for protection of fish species • Distribution of the project results as a brochure	• Increasing the awareness of local people and decision makers about the management of the basin • Studies about protecting the water level of Bafa Lake by collecting water from Büyükmender es river; but this becomes impossible due to the insufficient water level in Büyükmen-deres river

Table V.6 (continued)

Köyceğiz-Dalyan MP (Antalya Basin)	• Threats of water pollution due to tourism and agricultural activities	• Protection of ecosystems, especially biological diversity • Controlling of water usage and budget • Planning of residential, agricultural and industrial areas in sustainability perspective • Development of income sources • Increase of public awareness for environmental issues	• Environmental Protection Agency for Special Areas • İnönü University • Doğa Derneği • WWF-Turkey • Çınar Mühendislik	• Farmers • Fishermen • Workers of tourism sector	• There is no information about social capacity building activities	• Landuse Plan of Köyceğiz Dalyan was prepared in 1989 and revised in 1991 • Biological Diversity Analysis was made • Sociological analysis was made • Water ecosystems of Köyceğiz-Dalyan were analyzed • A fishery project for Köyceğiz Dalyan Protection Area was prepared. • An environmental monitoring project was prepared.	• Construction of two waste water treatment systems • Construction of a solid waste storage system • Establishing of "Union of Dalyan-Köyceğiz Municipalities" for solving infrastructure problems of the area	• Amendment of the "Landuse Plan" of the area that allows tourism activities in several naturally important areas • Organization of land-use activities • Preparation of all sub-plans with the participation of various sectors • Encouraging eco-tourism activities

Table V.6 (continued)

Köyceğiz -Dalyan MP (Antalya Basin)						• Köyceğiz Lake Water Quality Monitoring Project was prepared.		Increasing the awareness of local people and decision makers about the management of the basin
Eğirdir Lake MP (Antalya Basin)	• Threats of water pollution due to agricultural activities • Decrease of water level in Eğirdir Lake	• Decrease of water pollution • Protecting the water level in Eğirdir Lake • Encouraging people for using sustainable techniques in agricultural and fishery activities	• Ministry of Environment and Forestry • WWF-Turkey	• Farmer • Fishermen • Industrialist	• Organization of a meeting about agricultural pesticides • Organization of meetings about treatment systems • Organization of meetings about drip irrigation systems • Organization of meetings about sustainable	• Studies were continued for preparation of Eğridir Lake Basin Management Plan • As a pilot project of Eğirdir Lake Basin Management Plan, “Eğirdir Lake Basin Domestic Waste Water Management Plan” was prepared with cooperation	• Construction of wastewater treatment systems for residential areas • Construction of an industrial wastewater treatment system in 1998	• Management of wastes • Controlling agricultural activities by using sustainable methods • Increasing the awareness of local people and decision makers about the management of the basin

Table V.6 (continued)

					fishery activities	of Isparta Province and TUBİTAK		
Burdur Lake MP (Burdur Lake Basin)	• Decrease of water level on Burdur Lake • Water Pollution due to industrial and domestic activities	• Protection against water pollution by making all activities consider about biological diversity of the lake • Construction of all necessary treatment systems in five years • Increasing public awareness for sustainable usage of natural resources	• Ministry of Environment and Forest • Burdur Province • Burdur Municiplality • Doğa Derneği • UNEP • GEF	• Industrialist • Farmers	• Organization of a meeting on January 10,2008 for partnerships • Education activities for students for increase their environmental awareness • Outreach activities for explaining sustainable development examples	• Studies for preparation of Burdur Lake Management Plan has continued since 2005 • Burdur Landuse Plan was prepared in the scale of 1/25000	• Construction of a wastewater treatment system for domestic usage • Construction of a wastewater treatment system for sugar factories • Obtaining the institutional and technical infrastructure for long-term public monitoring systems	• Increasing the awareness of local people and industrialists about the treatment systems of wastes • Increasing the awareness of local people and decision makers about protection of endemic species and water resources in the basin

Table V.6 (continued)

Akşehir-Eber MP (Akarçay Basin)	• No water in Akşehir Lake • Decrease of water level in Eber Lake • Water pollution in Eber Lake due to industrial, agricultural and domestic activities	• Feeding Akşehir and Eber Lakes for increasing their water levels until 2010 • Organization of water flow in Akarçay River • Increase of public awareness for water usage	• Ministry of Environment and Forest • General Directorate of State Hydraulic Works • Çınar Mühendislik • WWF-Turkey • Afyon Province • Konya Province	• Industrialist • Farmers • Fishermen • Irrigation Unions • Chicken manufacturer	• Organization of introduction meetings	• Biological diversity analyses was prepared • Water quality monitoring projects were prepared • Soil characteristics and agricultural potential evaluation project was prepared • Akşehir-Eber Management Plan was prepared between 2005-2007	• Construction of drip irrigation systems • Prohibition of Eber Lake usage for irrigation activities • Demolishing of illegal water blocking systems	• Developing a database about the basin by collecting various studies prepared for the area • Increasing the awareness of local people and decision makers about the management of the basin

Table V.6 (continued)

Sapanca Lake MP (Sakarya Basin)	• Decrease of water level due to agricultural and industrial activities • Pollution of water and decreasing of water quality due to chemical wastes	• Protection physical and ecological characteristics of Sapanca Lake	• Ministry of Environment and Forest • General Directorate of State Hydraulic Works • Adapazarı Metropolis • Sakarya Province • Sakarya Municipality • WWF-Turkey	• Industrialist • Farmers	• There is no information about social capacity building activities	• Sapanca Lake Landuse Plan was prepared in the scale of 1/25000 on August 18,2003 • Studies for preparation of Sapanca Basin Management Plan are still continued	• Construction of a infrastructure system for collecting overflowed waters to Sapanca Lake	• There is no information about the success of the plan
Sultan-sazlığı MP (Kızılır-mak Basin)	• Pollution of water due to agricultural and industrial activities	• Obtaining sustainability of watershed ecosystems and biological diversity	• Ministry of Environment and Forest • Ministry of Agriculture and Village Affairs • GEF • Kayseri Province	• Industrialist • Farmers • Workers of tourism sector	• Organization of meetings for participation of all stakeholders to the management plan	• Water Resource Management Plan was prepared in 2008 • Ecotourism and husbandry plans were prepared	• There is no information about the implementation activities of the plan	• Participation of local stakeholders in planning process • Achieving a holistic and dynamic planning process

Table V.6 (continued)

Sultan-sazlığı MP (Kızılır-mak Basin)	• Drying of reed beds due to over water usage from Yay Gölü	• Obtaining management cooperation for sustainability of Sultansazlığı	• Directorate of Natural Protection and National Parks		• Organization of an introduction and information meeting on February 17, 2008	• Studies for preparation of GEF-II Biological Diversity and Natural Resources Management Plan has been continued since 2000 • Sultansazlığı National Park Long-term Development and Management Plan was prepared in 2008		

Table V.6 (continued)

Akgöl Lake-Ereğli Sazlıkları MP (Konya Closed Basin)	• Decrease of water level in Akgöl Lake • Pollution of water due to wastewater discharges	• Capacity-building for wise use of water resources • Implementation activities for wise use of water resources	• Ministry of Environment and Forest • WWF-Turkey • ESKOD • Ereğli Municipality • The State Planning Organization	• Farmers • Hunters	• Organization of education activities about drip irrigation systems and ecological agriculture implementation • Organization of meetings for information	• Studies for preparation of Akgöl Lake Management Plan are still continued • İvriz Dam project for construction of a closed system was prepared • Solid Waste Treatment Project was prepared	• Construction of a wastewater treatment system in 2007 • Construction of drip irrigation systems • Obtaining ecological agricultural fields • Realization of drip irrigation and organic agriculture applications in the pilot areas	• Increasing the awareness and capacity of local people and decision makers about the problems and management of the basin • Water, energy and labor saving in agricultural activities by using new methods • Obtaining a road map to maintain the sustainable existence of mashes and to solve the problems in the area

Table V.6 (continued)

Kızılır-mak Delta MP (Kızılır-mak Basin)	• Pollution of water due to agricultural pesticides • Construction of Secondary Houses • Destruction of forests for agricultural activities • Decreasing of fish species in Kızılırmak River	• Protection of bird species • Protection of watershed area by increasing public awareness	• Ministry of Environment and Forest • Doğa Derneği • Ondokuz Mayıs University • Bird Research Association • Buğday Association • Association of nature and wildlife protection	• Fishermen • Farmers • Hunters • Salt Manufacturer • Building constructor	• Organization of meetings for stakeholder informed • Organization of a meeting about introduction of Kızılırmak Delta Management Plan draft	• Kızılırmak Delta Management Plan was prepared between 2006-2007 • Kızılırmak Delta Landuse Plan was prepared in 1996	• Construction of a wastewater treatment system in 1997 • Construction of a wastewater infrastructure system in 1999	• Discussion of sustainable salt production methods
Tuz Lake MP (Konya Closed Basin)	• Pollution and drying of Tuz Lake due to wrong agricultural activities	• Protection of Tuz Lake from pollution • Implementation activities for wise use of water resources	• Environmental Protection Agency for Special Areas • WWF-Turkey	• Farmers • Salt Manufacturer	• Organization of several meetings for information exchange between stakeholders	• Waste water and solid waste treatment projects were prepared	• Construction of drip irrigation systems • Construction of solid waste storage system in Aksaray, Cihanbeyli and Şeferlikoçhisar	• Increasing the awareness and capacity of local people and decision makers about the problems

Table V.6 (continued)

Tuz Lake MP (Konya Closed Basin)	• Discharging of waste sludge to the lake • Pollution of water due to domestic and industrial wastewater discharging	• Capacity-building for wise use of water resources	• The Bank of Provinces • Konya Municipality • Ministry of Agriculture and Village Affairs		• Organization of education activities about drip irrigation systems and ecological agriculture implementation	• Tuz Lake Water MP was prepared in 2006 • Tuz Lake Landuse Plan was prepared in mid2008 • Agriculture Plan was prepared • Drip irrigation projects were prepared	• Construction of wastewater treatment and infrastructure systems	of the basin • Preparation of the management plan with the active participation of the stakeholders • Controlling agricultural activities by using sustainable methods • Management of the wastes

Table V.6 (continued)

Beyşehir Lake MP (Konya Closed Basin)	• Decrease of water level in Beyşehir Lake due to over-irrigation activities • Change of ecological characteristic of the lake • Water pollution due to agricultural and domestic activities	• Development of agriculture and fishery activities in sustainability perspective • Increase of water level by controlling agricultural and domestic activities	• Ministry of Environment and Forestry • WWF-Turkey • Konya Province • Selçuk University • Beyşehir Municipality • Ministry of Agriculture and Village Affairs • General Directorate of State Hydraulic Works	• Farmers • Fishermen • Sugar Manufacturer • Workers of tourism sector	• Organization of meetings for stakeholders and partners in Ankara and Konya between 2004-2005	• Studies for preparation of the Landuse Plan have been continued since April 2001 • Studies for preparation of the Beyşehir Lake Watershed Management Plan have been continued since 1997 • Studies for preparation of the Long-term Development Plan have been continued since 1993	• There is no implementation activities due to unfinished planning studies	• Increasing the awareness and capacity of local people and decision makers about the problems of the basin

Table V.6 (continued)

Göksu Delta MP (East Mediterranean Basin)	• Water pollution in Göksu River due to agricultural industrial and domestic activities • Decrease of bird species due to wrong hunting activities • Drying of the watershed area due to construction of secondary houses	• Protection of biological diversity by increasing public awareness • Decrease of water pollution by sustainable implementation of agricultural, industrial and domestic activities	• Ministry of Environment and Forestry • Environmental Protection Agency for Special Areas • Ministry of Agriculture and Village Affairs • WWF-Turkey • Çukurova University • Mersin University • Çınar Mühendislik	• Fishermen • Farmers • Hunters • Industrialist • Building constructors	• Organization of three meetings for stakeholders and partners between 2000-2007 • Organization of education activities for farmers in 2001 • Organization of education activities about protection of environment since 1991	• Göksu Delta Management Plan was prepared in 1999 • Studies for revision of the Goksu Delta Management Plan have been continued since 2007 • Socio-economic Analysis of Göksu Delta was performed in 2007 • Studies for preparation of the Göksu Delta Integrated Project for Sustainable Use of	• Controlling hunting activities • Construction of Bird Monitoring Area	• Increasing the awareness and capacity of local people and decision makers about the problems and management of the basin • Participation of related stakeholders in planning process • Definition of ecologically critical areas • Controlling water level by using related computer programs

Table V.6 (continued)

Göksu Delta MP (East Mediterranean Basin)						Natural Resources and protection of Biological Diversity have been continued since 2006		
Yumurta-lık Lagoon MP (Ceyhan Basin)	• Water pollution of Ceyhan River due to agricultural industrial and domestic activities • Decrease of bird species due to wrong hunting activities	• Development of management tools for protection and wise usage of Yumurtalık Lagoon • Definition of land-use activities with reference to Yumurtalık Lagoon protection principles	• Ministry of Environment and Forestry • Ministry of Agriculture and Village Affairs • General Directorate of State Hydraulic Works • Turkish Bird Research Society • GEF • Çukurova University	• Fishermen • Farmers • Hunters • Water Products Cooperatives	• Organization of three meetings for stakeholders and partners • Establishing of a web site and an e-mail group for communication of all stakeholders • Organization of education activities by Çukurova University • Organization of radio programmes	• Yumurtalık Lagoon Management Plan was prepared in 2007 • Studies for preparation of socio-economic and ecological analyses projects are still continued	• There is no information about the implementation activities of the plan	• Increasing the awareness and capacity of stakeholders about the problems and management of the basin • Active participation of the relates stakeholders in planning process • Definition of “watershed protection areas” in the

Table V.6 (continued)

Yumurta-lık Lagoon MP (Ceyhan Basin)			• Tour de Valat Biology Station • Association of Environment and Consumer Protection		about watershed and water resource protection			basin • Organization of ”Local Watershed Committee” in the Ceyhan Basin
Fırtına Valley MP	• Threats of water pollution due to forestry, agricultural construction and tourism activities	• Increasing public awareness about natural protection	• Ministry of Environment and Forestry • WWF-Turkey • Union of Yeşil Artvin	• Farmers • Hunters • Workers of tourism sector	• Organization of a meeting for stakeholders and partners in Artvin in 2007	• Biological Diversity Protection project was prepared in 1995 with the participation of Turkey, Russia, Azerbaijan, Georgia, Armenia and Iran	• Establishment of the Institutional Coordination Center	• Increasing the awareness and capacity of stakeholders about the problems and management of the basin

Table V.6 (continued)

Fırtına Valley MP	• Threats for ecological sustainability due to construction of dams and hydroelectric centrals		• Association of Rural Environment and Forest Problem Analyses		• Preparation of a documentary film for students about Fırtına Valley	• Studies for preparation of the Fırtına Valley Integrated Basin Management Plan have been continued since 2006		• Active participation of the relates stakeholders in planning process

(Source: WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/, accessed on April, 2008;Bird Research Society, http://www.kad.org.tr/eski/yumurtalikpr.htm, accessed on April, 2008; Environmental Investment Programme, http://www.rsdpinfo.com/, accessed in April, 2008; Haberler.com, http://www.haberler.com/yumurtalik-lagunleri-yonetim-plani-sulak-alan-haberi/, accessed on April, 2008; WWF Turkey 2007b, 1-6; Avrupa Yakası Newspaper, http://www.avrupayakasi-gazetesi.com/, accessed on April, 2008; Gürpınar 2008, 61-70;
Trakya Basını, http://basin.trakya.edu.tr/Haberler/, accessed on April, 2008; Ministry of Environment and Forestry, http://www.styd-cevreorman.gov.tr/, accessed on April, 2008; WWF Turkey 2008a, 33; Doğa Derneği, http://www.dogadernegi.org/, accessed in April, 2008;
Ege Doğa Derneği,http://egedoga.org/, accessed on April, 2008; Ege University, http://euspk.ege.edu.tr/bulten/5/edykd.doc, accessed on April, 2008; Çınar Mühendislik, http://www.cinarmuhendislik.com/, accessed on April, 2008; Environmental Protection Agency for Special Areas, http://www.ockkb.gov.tr/tr/, accessed on April, 2008; Newspaper, http://www.hedefgazetesi.net/, accessed on April, 2008;
Göktan 2008, 79-82; WWF Turkey 2006a, 2-3; WWF Turkey 2008a, 30-37; İstanbul University 2005, 1-11; WWF Turkey 2006b, 4-5; Yılmaz 2008, 29-36; Türkiye Tabiatı Koruma Derneği, http://www.ttkder.org.tr/, accessed on April, 2008; Kayseri Gündem, http://www.kayserigundem.com/, accessed on April, 2008; Ministry of Environment and Forestry, http://www.cedgm.gov.tr/, accessed on April, 2008; Gebze Ticaret Odası, http://www.gebzeto.org.tr/, accessed on April, 2008; Yeni Şafak Newspaper, http://yenisafak.com.tr/, accessed on April, 2008; Beyşehir Göl Newspaper, http://www.beysehirgolgazetesi.com/, accessed on April, 2008; Silifke Kaymakamlığı, http://www.silifke.gov.tr/, accessed on April, 2008; Uras 2008, 119-124; Altunbaş 2006, 30-42)

Mr. Berke states that although most of those water-basin management planning studies were concerned about integrated and holistic planning approach, they remained at the watershed scale, and the plans produced were also approved and implemented at this scale due to inadequate legal and administrative frameworks. Therefore, they are legally called as a *"watershed management plan"*. Only Konya Closed Basin and Gediz Delta Management Plan studies are realized at the basin scale, as the IWRM planning approach suggests.

"Uluabat Lake Management Plan" is the first watershed management plan experience of Turkey prepared with the participation of various stakeholders and without any legal and administrative obligation. After this experience, the Ministry of Environment and Forestry decided to establish a "national watershed committee[25]" and "local watershed committee[26]", and prepare "watershed protection regulation[27]" in order to continue water management planning studies within a legal and institutional framework. Then, above management plans were prepared by the coordination of the Ministry of Environment and Forestry, and in the direction of this legal and institutional framework (WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/, accessed on April, 2008).

When examining the Table V.6, the following inferences are made:

- All management planning processes were realized in a participatory manner with the organization of social capacity building activities.

[25] Ulusal Sulak Alan Komitesi
[26] Yerel Sulak Alan Komitesi
[27] Sulak Alan Koruma Yönetmeliği

- The main coordinator of the entire plans is the Ministry of Environment and Forestry so as to continue water management planning studies within a legal and institutional framework.
- Universities, WWF-Turkey and General Directorate of State Hydraulic Works are other partners that usually support the processes.
- The social capacity building activities are generally organized in local areas in order to provide public participation at large; and the meetings organized in Ankara are usually realized with the participation of decision makers for discussing the general frameworks of the plans.
- Most of the implementations are related to wastewater treatment and solid waste collection activities, because these are the key technical issues for solving the pollution problems in terms of sustainable development.

In conclusion, although there are legal and institutional gaps in Turkey, the management plans have had successful results in terms of increasing public awareness and capacity, obtaining inter-sectoral coordination, and participation of stakeholders to planning process.

V.4. How The Water-Basin Management Planning Is Positioned within The Regional Planning System of Turkey

Since the major problem of Turkey is the social and economical inequalities among regions, all regional plans have been prepared to solve this problem for years; and the planning scale has been

identified depending on this aim. Moreover, the water resource management approach has been applied as a social and economical development tool in these plans. However, since nature conservation approach was not concerned seriously in these plans, after the 1990s, the social and economical inequality brought about environmental threats –especially drought and quality decrease problems of soil and water resources—. Today, these environmental problems have become the crucial threats on social and economical activities and also on natural resource systems.

For the 1990s, Urban Improvement Plans for Nature Protection and Land-Use Plans have been prepared in order to solve this problem. However, these plans have implementation problems, because the legislation gives all responsibilities to related governmental institutions, but they do not clearly describe the distribution of roles among these institutions. Since the plans are prepared by the experts of related governmental institutions without public participation, they could not serve public's needs and also not protect water resources and their ecosystems properly (Dıvrak 2007, 155; Onur 2003, 41-42; The State of Planning 2007, 39-44).

In order to overcome these planning failures in Turkey, there is a need for the **IWRM planning approach** that is implemented at the **water-basin scale.** This approach has a sustainability-oriented, integrated and participatory characteristic to attain a balance between development and nature conservation. In other words, this approach actually embraces all the regional planning tools that have been used in different regional plans in Turkey for years.

After 1999, Turkey became familiar with similar water resource management planning experiences as a result of the harmonization processes with the EU. However, these experiences could not attain the expected results, because the IWRM planning approach requires legal identification of a **water-basin** together with a **water-basin committee** established for that basin; but the legal and institutional framework in Turkey is different. In the absence of necessary legal and institutional bases, IWRM planning approach causes conflicts between authority subjects, stakeholders and implementation problems. In order to overcome these problems, water-basin committees or similar structures can be established in the water-basin areas of Turkey shown in Figure V.8 with the participation of related governmental and non-governmental institutions, municipalities, governorships and also regional development agencies. If established, the IWRM plans should be prepared by the coordination of these committees. Moreover, these committees should also have the responsibilities about monitoring and evaluating of IWRM plans, because as Mr. Atauz mentions, there is no institution in Turkey that performs monitoring and evaluation activities after preparing a plan. However, IWRM plans need monitoring and evaluation due to their dynamic and flexible characteristics. Throughout the world, successful implementations of IWRM planning approach can be observed which were realized under the coordination of water-basin committees.

The important questions asked in this framework are how the IWRM plans can be connected to the regional planning system of Turkey, and which position could be suitable for IWRM plans in the planning hierarchy of Turkey. When examining the regional maps of Turkey, it is observed that the water-basin areas consist of more than one

region (NUTS2). Therefore, IWRM plans could be prepared for these water-basin areas, and these plans could serve as references for the regional development plans of NUTS2 areas. Although borders of NUTS2 and water-basins are different, regional development plans should be prepared with the reference of their related IWRM plans. However, there could be some difficulties in implementation: First of all, organization of this kind of system in Turkey could take too long time, and in the meantime some regional development plans could be prepared without the reference of an IWRM plan. Besides, since preparing an IWRM plan for a huge area requires a long time, it could be difficult to provide the participation of people in the planning process. Therefore, for solving these problems, regional development plans and other planning studies should be realized by using IWRM planning tools, and the IWRM plans for water-basin scale should be prepared followingly by combining these planning studies.

In conclusion, despite the possible implementation difficulties, if related institutional and legal frameworks are reorganized, the IWRM plans will be the most logical and effective approach to solve the dilemmas about development and natural conservation balance.

CHAPTER VI

CASE STUDY ON INTEGRATED WATER RESOURCE MANAGEMENT PLANNING: THE PROJECT OF "THROUGH THE WISE USE OF THE KONYA CLOSED BASIN"

VI.1. Methodology

In the previous chapters, I have explained the theoretical framework related to the IWRM planning, and water resource management in Turkey. In the following chapter, I will analyze the IWRM planning implementations in the Konya Closed Basin, taking care of the criteria --general principles and planning tools of IWRM planning— analyzed in Chapter III in order to answer the questions below:

- Why was the Konya Closed Basin selected as a plan area for IWRM?
- How has IWRM planning approach been implemented in the Konya Closed Basin until now?
- What are the results of the Konya Closed Basin IWRM planning efforts that have been implemented until now?
    - What has been changed and improved in the area after the plan implementations?
    - What are the contributions of these implementations to the regional planning discipline in Turkey?

As mentioned before, IWRM planning is a holistic and systematic approach in which various stakeholders work together in order to solve the water resource problems by developing institutional and personal capacities. In the research below, I will show the implementations of this complicated planning approach in the Konya Closed Basin, which is a living example of the IWRM planning.

Below, I will explain the research methodology with regard to the following issues: research design, research questions, units of analysis, and field survey.

VI.1.1. Research Design

Case Study Approach: In this thesis, I will use the *'case* study' approach as a research methodology because this approach allows the exploration and understanding of complex issues by providing holistic and in-depth explanations especially in social and behavioral problems. It also makes the researchers go beyond the quantitative statistical results and help them to understand the behavioral conditions through the actor's perspective by examining the phenomenon from the real-life. Due to these characteristics, case study approach has distinct advantages to answer the 'why' and 'how' questions which are about a contemporary event in its real-life context (Yin 1987, 23; Sakarya University, web.sakarya.edu.tr/~skuyucu/sunum/gokhan.ppt, accessed on April, 2008; Soy 1997, 1; Zainal 2007, 1-2).

There are two main reasons for choosing case study approach as a research methodology:

1. A research on the IWRM planning needs holistic and in-depth qualitative explanations more than the quantitative data due to its social and technical characteristics described in Chapter III.
2. The aims of the research are to explain 'why' Konya Closed Basin was selected as a plan area for IWRM planning; 'how' IWRM planning approach has been implemented in the Konya Closed Basin until now; and 'how' IWRM plan is differentiated from other planning types.

Single-Case Study Approach: This kind of approach is used for explaining a unique phenomenon from the real-life contexts. It also represents a critical case in analyzing a well-formulated theory (Yin 1987, 42-43; Zainal 2007, 2; Soy 1997, 2-3; Sakarya University, web.sakarya.edu.tr/~skuyucu/sunum/gokhan.ppt, accessed on April, 2008).

Therefore, in this research, I will use the single-case study approach, because the Konya Closed Basin and its IWRM Plan has the following unique characteristics:

- As a 'closed basin', it has a different water circulation system from other basins of Turkey. As a result, a 'unique' IWRM planning process has been planned and implemented in the Konya Closed Basin area.
- Since the Konya Closed Basin is a huge area that covers 53.000 km² in the boundaries of eight provinces, two lake-basins, and several watershed areas, during the IWRM planning process it has been very difficult to obtain continuous communication with

all regional and local stakeholders. Still, the Konya Closed Basin IWRM Plan is one of the successful examples of IWRM implementations with its participation and capacity-building processes. The process can be regarded successful, because many planning and implementation activities have been realized with the participation of 600 stakeholders since 2003 (Dıvrak 2008, 166).

V.1.2. Research Questions

The main research question is: *'Why and how has IWRM Plan been carried out in the Konya Closed Basin since 2003?'.* Besides there are some sub-questions that aim at revealing the unique characteristics of Konya Closed Basin IWRM Planning Process:

- What kind of a regional (natural and economical) system does Konya Closed Basin have? What are the potentials and problems of the area, which have been impacting on the realization of IWRM planning process?
- What are the partnerships established for the Konya Closed Basin IWRM planning process? Which stakeholders supported and involved in what stages of the process? Was there an ideal communication and information exchange between these stakeholders?
- What kind of social capacity building activities were organized for stakeholders? What are the results of these capacity building activities? Was the expected public awareness and participation obtained?

- What kinds of pilot projects were prepared in the catchment level? How were these projects implemented? What has been changed and improved in the area after these plan implementations?
- What kind of an IWRM plan has been produced until now? Do the Konya Closed Basin IWRM plan studies resemble the general principles of IWRM planning? What are the contributions of these implementations to the regional planning discipline in Turkey?

Meanwhile, the research also aims at understanding how far the Konya Closed Basin IWRM Planning Process met the criteria of IWRM planning approach mentioned in Chapter III.

VI.1.3. Units of Analysis

Units of analysis are the events or entities to be studied in the framework of research questions such as individuals, groups, organizations, decisions, plans, implementation process and organizational change (Yin 1987, 31). According to this perspective, there are three units of analysis in this thesis:

1. Stakeholders (institutions —governmental, non-governmental and private—, local people, associations) that supported and involved in the Konya Closed Basin IWRM planning process
2. Pilot (Catchment Level) Projects (Tuz Lake, Beyşehir Lake and Ereğli Marshes Management Plans) that were prepared and implemented in the catchment level
3. Konya Closed Basin IWRM Plan Studies (Through the Wise-use of Konya Closed Basin Project), some of which have been completed since 2003, while the rest of them are still in progress.

1. **Stakeholders:** One of the units of analysis is stakeholders and partnership organizations that supported and involved in the Konya Closed Basin IWRM planning process.

   The key partner of the plan is WWF-Turkey, who coordinated the entire IWRM planning process with the involvement of other stakeholders. The other stakeholders differentiate in terms their roles in IWRM planning process. Some of them were both influenced by and involved in the process, while the others involved in the process but were not influenced by it. Moreover, they consist of a wide range of international, national and local institutions that contributed to different stages of IWRM planning process:

   - International Level Stakeholders: Turkey Netherlands Water Partnership, European Union.
   - National Level Stakeholders: The State Planning Organization, Ministry of Environment and Forestry, Environmental Protection Agency for Special Areas, Ministry of Agriculture and Village Affairs, Ministry of Industry and Commerce, General Directorate of State Hydraulic Works, Ministry of Culture and Tourism, General Directorate of Mineral Research and Exploration, several professional chambers of Union of Chambers of Turkish Engineers and Architects, universities, national newspapers and televisions, WWF-Turkey, The Turkish Foundation for Combating Soil Erosion, Reforestation and Protection of

Natural Habitats[28] (TEMA), Doğa Derneği, Organic Product Producers and Industrialist Association[29] (ORGÜDER).

- Catchment Level Stakeholders: Provincial Agricultural Directorships[30] (Konya, Isparta, Aksaray), Konya Province Culture and Tourism Directorship, Provincial Environment and Forestry Directorships (Konya, Aksaray, Isparta), Konya Meteorology Regional Directorship, General Directorate of State Hydraulic Works 4th Region and 18th Region Directorships, The Foundation for the Promotion and Protection of the Environment and Cultural Heritage[31] (ÇEKÜL), Bird Research Society (KAD), The Society for the Protection and Improvement of Ereğli Mashes and Akgöl[32] (ESKOD), local newspapers and televisions, Provincial Governorships, Municipalities Association (Konya, Isparta, Aksaray, Niğde, Karaman, Ankara), Offices of Kaimakam (Ereğli, Çupra, Karapınar, Beyşehir, Şarkikaraağaç, Eskil, Cihanbeyli, Kulu), Municipalities (Ereğli, Aksaray, Çupra, Karapınar, Beyşehir, Şarkikaraağaç, Eskil, Cihanbeyli, Kulu, Selçuklu, Meram), Konya Greater City Municipality, General Directorate of Konya Water and Wastewater Administration, Industrial Organization Zones, Konya Sugar Factory, Ereğli Sugar Factory, PankoBirlik[33] (General Directorate, representative and senior organization of Beet Cooperatives), Provincial Command of Gendarmerie[34], Command of Environmental Protection Team[35], agricultural and water

[28] Türkiye Erozyonla Mücadele Ağaçlandırma ve Doğal Varlıkları Koruma Vakfı
[29] Organik Ürün Üreticileri ve Sanayicileri Derneği
[30] İl Tarım Müdürlükleri
[31] Çevre ve Kültür Değerlerini Koruma ve Tanıtma Vakfı
[32] Ereğli Sazlıkları Çevresini Koruma ve Güzelleştirme Derneği
[33] S.S. Pancar Ekicileri Kooperatifleri Birliği
[34] İl Jandarma Komutanlığı
[35] Doğa Koruma Takım Komutanlığı

products co-operatives, irrigation associations, Ziraat Bank, Canon-Erkayalar Photography, Eti Food Industry and Trade Co. Inc., beet producer co-operatives, Managers of Tekel Saltpan, farmers, local people

Pilot (Catchment Level) Projects: During the IWRM planning process, three pilot projects were prepared in order to realize the aims and principles of the Konya Closed Basin IWRM Plan at the catchment level:

1. Tuz Lake Management Plan
2. Beyşehir Lake Management Plan
3. Ereğli Marshes Management plan

2. **Konya Closed Basin IWRM Plan Studies:** Since 2003, the plan has been prepared in the name of 'Through the Wise-use of Konya Closed Basin Project'. As a unit of analysis, I will use the activity reports of the Konya Closed Basin IWRM planning process in order to answer the question of 'why has IWRM plan been realized in Konya Closed Basin since 2003?' and also sub-questions of 'What kind of an IWRM planning process has been produced until now? Do the Konya Closed Basin IWRM plan studies resemble the general principles of IWRM? What are the contributions of these implementations to the regional planning discipline in Turkey?'

VI.1.4. Field Survey

Data Sources: I will use two types of data sources, which are 'in-depth interviews' and 'documentary materials'.

Documentary materials are reports, books, brochures, protocols, maps, official documents, archives, planning documents, advertisements, web site documents, e-mails, photos etc. These materials were collected in order to answer all research questions and sub-questions, and also obtain a guideline for in-depth interviews with partners.

In-depth interviews were conducted in Ankara with experts of WWF-Turkey and Environmental Protection Agency for Special Areas[36] – key partners of the planning process. In order not to miss any detail about the process, Mustafa Özgür Berke, who was one of the coordinators of the process from WWF-Turkey, was interviewed to give extra information about the IWRM planning process; and Sezer Göktan and Aygün Erdoğan, who were two experts from Environmental Protection Agency for Special Areas, were interviewed to give detailed information about the Tuz Lake Management Planning Process. These interviews have been very useful for minimizing the disadvantage of case study approach, which is defined by Yin as the lack of rigour, by obtaining inside perspective about the process, and also opportunity to hear more than one version of the same story.

[36] Özel Çevre Koruma Kurumu Başkanlığı (ÖÇKKB)

The Obstacles Met in The Field Survey: Three coordinators of the Konya IWRM planning process were interviewed in Ankara: two of them from Environmental Protection Agency for Special Areas and one from WWF-Turkey. Although not many interviews were conducted, they have been very useful for understanding and evaluating the process. However, in WWF-Turkey, I could not interview with the main coordinators of the process due to their working mass in abroad. If I had interviewed with these people, it would have been easier and earlier to understand the process.

Analysis of the Findings and Interpretation: As mentioned before, the study examines the findings in order to answer the question 'Why IWRM planning process has been realized in the Konya Closed Basin area?' and sub-questions related to it.

The study also examines 'How far the Konya Closed Basin IWRM Planning Process has met the criteria of IWRM planning?' The literature describes the IWRM planning criteria with twelve general principles and three planning tools:

- Twelve general principles:
  1) Holistic approach
  2) Catchment level approach
  3) Strategic approach
  4) Systematic approach
  5) Goal-oriented approach
  6) Adaptive management approach
  7) Participatory approach
  8) Capacity-building approach
  9) Reliable and sustained financing

10) Water as an economic good
11) Social dimension of water management
12) Strengthen roles of women

- Three planning tools:
  1) The importance of stakeholders' support and involvement in realization of the IWRM planning.
  2) Positive effects of social capacity building activities on realization of IWRM plan.
  3) The crucial role of staging the IWRM planning process for efficient results.

VI.2.Through the Wise Use of Konya Closed Basin: Process and Organization

Gernant Magnin, a Dutch environmental expert worked in the Society for The Protection of Nature Turkey (DHKD[37]), noticed the drought problems of the Konya Closed Basin in the early 1990s during his bird monitoring activities, and then under the umbrella of the DHKD, he planned to prepare a comprehensive project for the protection of the Konya Closed Basin. With this aim, the biological and natural characteristics of the area were explored between 1997 and 2003 in order to understand potentials and threats. During these explorations, it was realized that the threats were not caused by a single resource; all activities around the basin affected the natural system of the area. Therefore, the entire "basin scale" was identified as the most proper scale for management and planning activities of the Konya Closed Basin. As a result of these, in 2003, WWF-

[37] Doğal Hayatı Koruma Derneği - Türkiye

Turkey[38] decided to prepare an IWRM plan for the basin, because only an *integrated* and *participatory* management approach would solve the problems of the basin due to its closed and complex characteristics. Since then, the IWRM planning process has been still continued with social capacity building activities and catchment level projects. However, the IWRM plan for Konya Closed Basin has not been prepared yet.

The following sections will explain the IWRM planning process of Konya Closed basin from 1997 until today under the following titles:

- Analyses Realized Between 1997-2003
- The Konya Closed Basin Planning Process: Through the Wise Use of Konya Closed Basin
- Analyses Realized for Evaluation of Existing Situation and Problem Identification in The Konya Closed Basin
- Aims of The Konya Closed Basin Planning Process
- Organization of The Konya Closed Basin IWRM Plan: Stakeholders of The Plan and Social Capacity Building Activities
- Catchment Level Projects of The Plan: Tuz Lake Management Plan as a priority area

VI.2.1.Analyses Realized Between 1997 and 2003

The analyses were started in the area in 1997 in order to gather information about bird population as well as other fauna. Later, the information gathered in these analyses was used to produce the "Biodiversity Hotspot Atlas of the Konya Basin" that would provide a basis for all kinds of conservation studies in the area (Konya Basin

[38] DHKD became WWF-Turkey through participating WWF International.

Bird Survey, http://www.euronet.nl/users/icu12235/konya/, accessed on June 5, 2008; Atlas Dergisi 2007a, 114).

During the analyses, first, the border of the basin was determined with respect to the topographic characteristics. Then, it was divided into 10x10 kilometer squares; and in every square, a standard monitoring activity was carried out by various experts (See Figure VI.1). As a result, several different species were discovered and some species, which were supposed to have disappeared, were found again. In addition, internationally important hotspots in the area were identified by using wetland birds as indicators. Finally, the most comprehensive biological inventory of Turkey was prepared with definition of several wetlands and the fauna living there (Atlas Dergisi 2007a, 114).

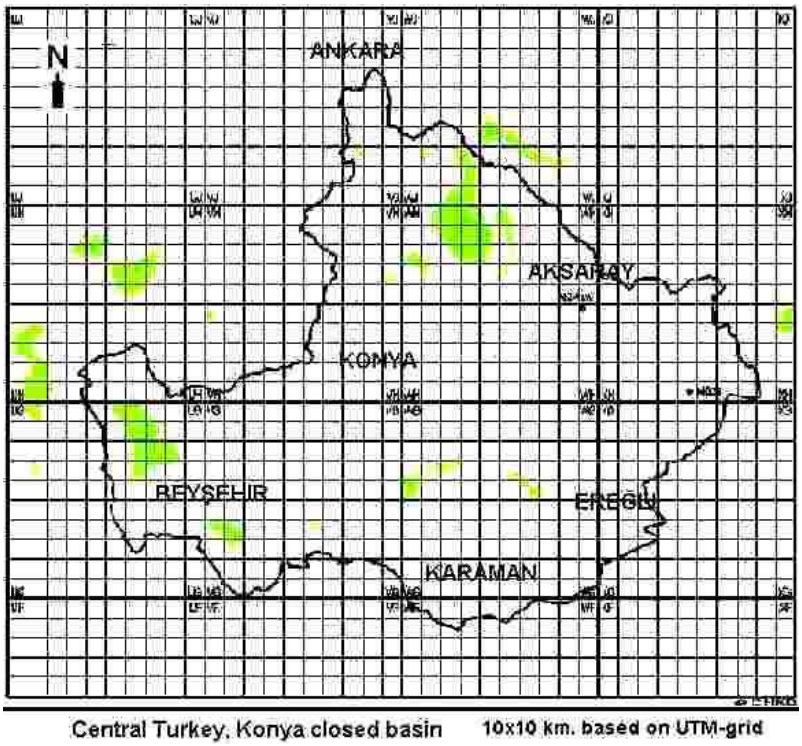


Figure VI.1: Map of Konya Closed Basin prepared by DHKD in 1997 (Source: Konya Basin Bird Survey, http://www.euronet.nl/users/icu12235/konya/map.htm, accessed on June, 2008)

These analyses provided the following outputs that led to the Konya Closed Basin IWRM planning:

- Out of the 16 Important Bird Areas (IBA) in the area, 14 were found during these analyses. These areas provided the basis to define priority areas for protection because birds are regarded as important and practical indicators of the 'value' and 'health' of the water resources and wetlands elements of the basin.
- The important wetland areas with different conservation statuses were identified (See Table VI.1). These areas, too, provided the basis to define priority areas for protection.

- Several endemic lynx, polecat, wild sheep, brownbear, jackal, wolf, frog and rodent species were found in the highest points of the area – Toros, Sultandağı, Amanos mountains. The habitats of these species were also regarded as the basis to define priority areas for planning and conservation activities.
- The main threats of the Konya Basin were identified as the conversion of grasslands and steppe to arable cultivation, overgrazing of grasslands, irrigation of agricultural lands, drainage and diversion of water from wetlands, water level increases in certain lake systems, and pollution of water courses and lakes. The following planning studies were realized taking care of these threats.
- Tuz Lake and Konya Closed Basin were identified as in the need of urgent conservation and a priority area for DHKD action during 1998-2001. The studies for basin-wide management of the area were started by DHKD in these three years. Moreover, Tuz Lake area –Tuz Lake, Kulu Lake, Tersakan Lake, Bolluk Lake and the adjacent area— was declared as a "Special Protected Area" by the Ministry of Environment in 2000 as a result of DHKD actions in the area.
- Konya Closed Basin was accepted as one of the 200 ecologically important areas of the world by WWF in 1998. This is one of the reasons of WWF Turkey for selecting Konya Closed Basin as a plan area for IWRM planning (WWF-Turkey, http://www.wwf.org.tr/en/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari/projeler/konya-kapali-havzasinin-akilci-kullanimina-dogru/, accessed on February, 2008; Konya Basin Bird Survey, http://www.euronet.nl/users/icu12235/konya/project.htm, accessed on June, 2008; Göktan 2007, 74).

Table VI.1: Wetlands in the Konya Closed Basin in 1997

Wetlands in Konya Closed Basin	Border of Basins	Area (hectares)	Properties	Conservation Statue
Samsam Lake	Konya	830	little salty	Natural Conservation Area (1992)
Kozanlı Lake	Konya	650	fresh water, reedy	Natural Conservation Area (1996)
Kulu Lake	Konya	860	little salty	Natural Conservation Area (1992)
Tersakan Lake	Konya	6.400	salt lake, saltpans	Natural Conservation Area (1992)
Suğla Lake	Konya, Antalya	16.500	fresh water lake	No protection statue
Bolluk Lake	Konya	1.100	salt lake, saltpans	Natural Conservation Area (1992)
Beyşehir Lake	Konya, Isparta	73.000	fresh water lake	Natural Conservation Area (1992), Beyşehir National Park, Kızıldağ National Parks, Drinking water reserve
Tuz Lake	Konya, Aksaray, Ankara	260.000	salt lake, sparsely vegetated plain	Natural Conservation Area (1992), Special Environment Protection Area (2000)
Ereğli Marshes	Konya, Karaman	37.000	fresh water, reedy, marsh	Natural Conservation Area (1992), Nature Reserve
Eşmekaya Marshes	Aksaray	11.250	fresh water, salt lakes and reedy	Natural Conservation Area (1992), Wildlife Protection Area
Hotamış Marshes	Konya	16.500	fresh water, small salt lake	Natural Conservation Area (1992)

(Source: WWF-Turkey, http://www.wwf.org.tr/en/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari/projeler/konya-kapali-havzasinin-akilci-kullanimina-dogru/, accessed on February, 2008; Magnin & Yarar 1997)

VI.2.2.The Konya Closed Basin Planning Process: Through the Wise Use of Konya Closed Basin

The Konya Closed Basin Planning Process is an IWRM planning process which was started by WWF-Turkey in 2003 and is still going on with the participation of 600 stakeholders. The process mainly includes **capacity building activities** (education activities and communication plans) and **catchment level projects**. It should be noted that the activities that took place in the planning process did not follow one another; they were generally realized simultaneously; i.e. catchment level projects and other activities were started within the same period (See Figure VI.2).

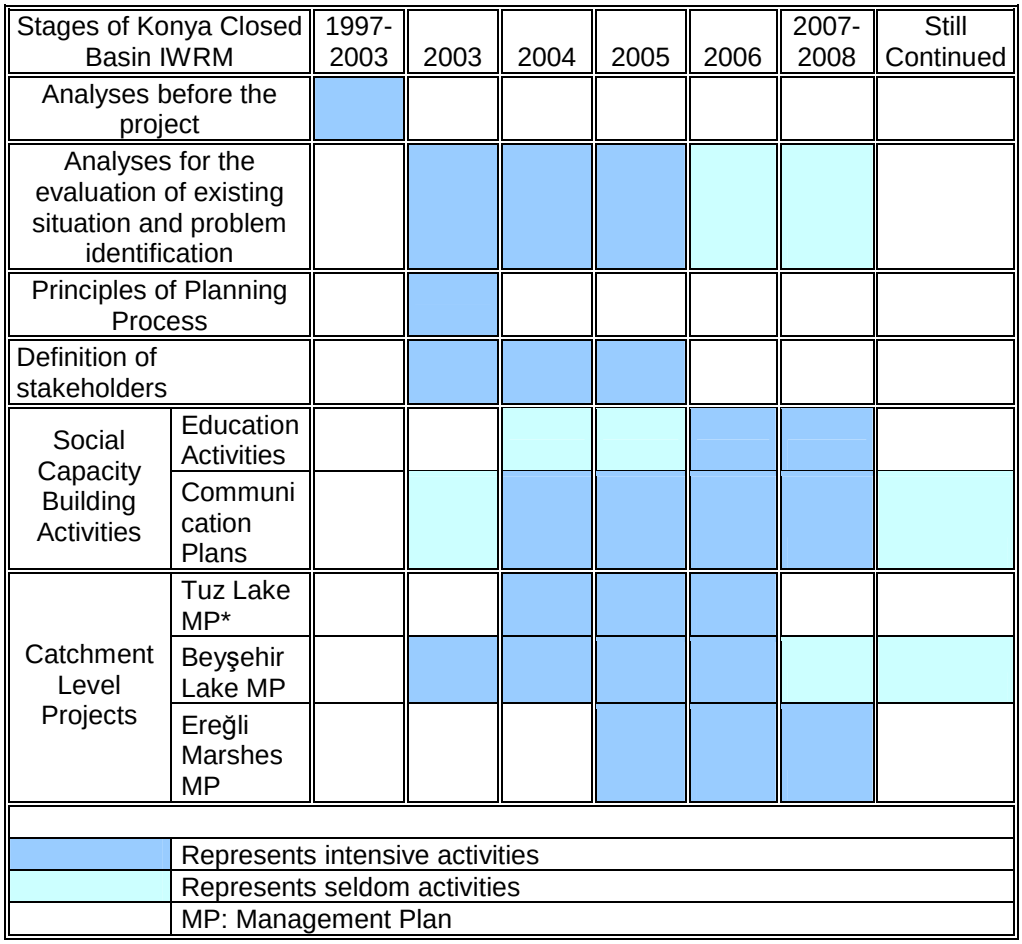


Figure VI.2: Stages of Konya Closed Basin Planning Process

VI.2.2.1. Analyses Performed The Evaluation of Existing Situation and Problem Identification

Analyses in the area were started in 2003 by WWF-Turkey in order to attain a data basis for the IWRM planning process and this process is still going on with various researches of different partners. The studies generally consist of socio-economic, agricultural and

underground water analyses in three sub-basin areas –Tuz Lake sub-basin, Beyşehir Lake sub-basin and Ereğli sub-basin.

Prior to the analyses, borders of the Konya Closed Basin were determined. Then analyses were realized within a five-year period through resource review and data collection, field surveys, interviews, meetings and scientific researches. The aim of the analyses was to evaluate economic activities, natural resource use, economic-ecologic relationships, and existing planning activities in the area. Another aim was to identify stakeholders of the project (Özesmi, Tırpan, Uzel 2005, 1).

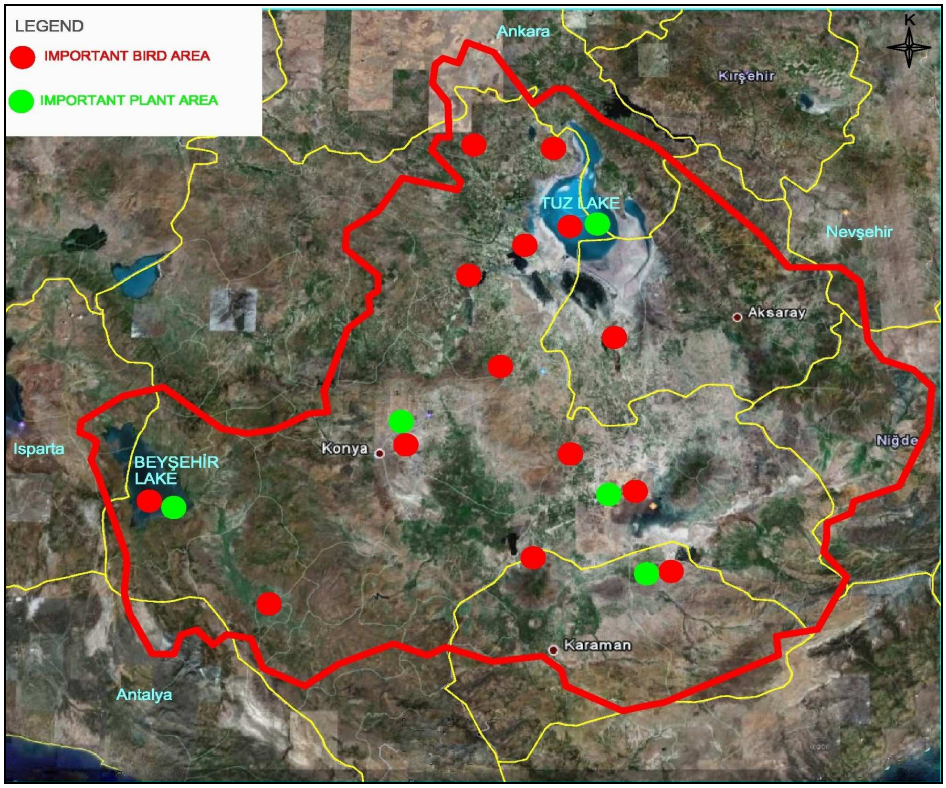


Figure VI.3: Map of Konya Closed Basin (Source: Drawn with reference to WWF-Turkey 2005, 2)

Although the studies are still continued, in first three years, potentials and problems of the area were adequately examined. The problems and potentials are as follows:

- **Potentials of Konya Closed Basin:**

Konya Close Basin is a huge basin located in the Central Anatolia and covers 53.000 km² area; i.e. 7% of Turkey's total area. It takes place within the borders of 39 districts of eight provinces –Ankara, Aksaray, Isparta, Karaman, Konya, Niğde, Nevşehir and Antalya.

The high mountains around the area block the drainages of water resources; therefore, the circulation of stable water in the basin ends in the marshes and sub-marshes, and the biggest closed basin of Turkey does not have any river or sea connection. This situation creates a unique water circulation system in the area, which includes little amount of rain fall and high evaporation ratio. Moreover, it also makes the soil characteristic alluvial and salty.

The basin is one of the 200 ecologically important areas of the world with wetlands, wide salt-steppes, 16 IBA, 6 Important Plant Areas (IPA), and various endemic species. Moreover, it also includes 15 natural conservation areas with different statuses (See Table VI.2) (Dıvrak 2008, 166; WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/nerede-calisiyoruz/konya-kapali-havzasi/, accessed on April, 2008; WWF-Turkey, http://www.wwf.org.tr/en/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari/projeler/konya-kapali-havzasinin-akilci-kullanimina-dogru, accessed on February, 2008; Özesmi, Tırpan, Uzel 2005, 2-3).

The population living in the settlements of the basin is 3 million; and 45% of them live in rural areas and the rest live in urban areas. The population of the rural areas decreases while that of the urban areas increases due to migration from rural areas to city centres and abroad.

Agriculture, generally irrigated-agriculture, is the main income-generating sector in the basin; and wheat and sugar beet are the dominant products. In Ereğli sub-basin, husbandry, fishing and reed cutting are other income-generating sectors. In addition, industrial sector depending on agriculture has become important in recent years. In Tuz Lake sub-basin, salt production is the main economic sector with agriculture –80% salt production of Turkey is made here. Except from these, fishing and reed cutting are other income-generating sectors of the area. In Beyşehir Lake sub-basin, fishing is the main economic activity with agriculture. However, in recent years, agricultural-based industry has become the dominant sector due to fish deaths depending on water pollution and drought problems (Özesmi, Tırpan, Uzel 2005, 2-7; WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/nerede-calisiyoruz/konya-kapali-havzasi/, accessed on March, 2008).

Table VI.2: Natural Conservation Areas in Konya Closed Basin

Natural Conservation Areas	Borders of Natural Conservation Areas	Conservation Status of Natural Resources	Conservation Planning Studies of Natural Resources
Kızıldağ National Park	Isparta, Şarkikaraağaç Distinct	National Park, 1993	Long-Term Development Plan (continued)

Table VI.2 (continued)

Beyşehir Lake National Park	Konya, Beyşehir Distinct	National Park, 1993	The Long-Term Development Plan (2007, wait for approval)
Tuz Lake Special Environment Protection Area	Konya, Aksaray, Ankara	Special Environment Protection Area, 2000	The Tuz Lake Management Plan (2006)
Hotamış Marshes	Konya, Karapınar Distinct	Natural Conservation Area, 1992	No conservation plan
Eşmekaya Marshes	Aksaray, Eskil Distinct	Natural Conservation Area, 1992; Important Bird Area	No conservation plan
Ereğli Marshes	Konya, Ereğli Distinct	Natural Conservation Area, 1992; Nature Protection Area, 1995	The Ereğli Marshes Management Plan (continued)
Kulu (Düden) Lake	Konya, Kulu Distinct	Natural Conservation Area, 1992; Important Bird Area	No conservation plan
Tersakan Lake	Konya, Cihanbeyli Distinct	Natural Conservation Area, 1992; IBA, Special Environment Protection Area, 2000	The Tuz Lake Management Plan (2006)
Ihlara Special Environment Protection Area	Aksaray, Güzelyurt Distinct	Special Environment Protection Area, 1990; Natural Conservation Area; Historical Conservation Area	No conservation plan
Karapınar Plain	Konya, Karapınar Distinct	Natural Conservation Area, 1989; IBA; IPA	No conservation plan

(Source: Özesmi, Tırpan, Uzel 2005, 2-3)

- **Problems of Konya Closed Basin:**

The main problem of the Konya Closed Basin is the decreasing level and pollution of fresh water resources due to unsustainable water management policies. Since water resources influence on all human activities, together with ecology, socio-economic conditions in the basin were also affected negatively due to this problem.
In agriculture, application of unsuitable production types (sugar beet, potatoes, etc) and irrigation systems (flooding method[39] and other open irrigation systems) caused the water level to decrease. When water level became insufficient for agricultural activities, several dams and cannels, which influence natural flows of water resources, were constructed by the General Directorate of State Hydraulic Works. Moreover, farmers began to use underground waters by digging wells and most of those wells have no legal permission – according to the report of General Directorate of State Hydraulic Works in 2008, 60000 of 92000 wells in the basin are illegal (Dıvrak 2008, 165; Atlas Dergisi 2007a, 116-117).

In addition to these, several wetlands were dried and accepted non-functional in order to obtain fields for agricultural and husbandry activities; and the remaining ones were polluted by discharging of untreated domestic, industrial and agricultural wastewaters. Furthermore, the soil characteristics of the basin changed negatively due to chemical pesticides, domestic and industrial wastes, and overgrazing of animals (Dıvrak 2008, 165; Atlas Dergisi 2007a, 116-117; Özesmi, Tırpan, Uzel 2005, 3; Tüm Gazeteler, http://www.tumgazeteler.com/?a=2231148, accessed on May, 2008).

[39] salma sulama sistemi

As a result of all these problems, water levels of the lakes and wetlands have decreased for ten years and some of them –Bolluk, Tersakan, Suğla and Düden Lakes, and Hotamış and Eşmekaya Marshes—were drought completely (See Table VI.3). Beyşehir Lake is no more the biggest fresh water lake of Turkey due to its decreasing water level. Moreover, the water level difference between the Tuz Lake and underground waters decreased from 50 meter to 15 meter within twenty years; and if it continues to decrease in that rate, it is expected that the water of Tuz Lake will start flowing to underground until 5-6 years. This means that the remaining amount of fresh water in the underground will not be usable if not refined due to mixture of sulfide water and fresh water.

Table VI.3: Diminishing Water Levels of Lakes and of Wetlands of The Konya Closed Basin between 1997-2008

Wetlands in Konya Closed Basin	Border of Basins	Area in 1997	Area in 2008 (hectar)	Properties	Protection Status
Samsam Lake	Konya	830 ha	400 (max)	little salty	Natural Conservation Area (NCA) (1992)
Kozanlı Lake	Konya	650 ha	650	fresh water, reedy	NCA (1996)
Kulu Lake	Konya	860 ha	Düden Lake (drought) Küçük Lake (small amount)	little salty	NCA (1992)
Tersakan Lake	Konya	6.400 ha	(drought)	salt lake, saltpans	NCA (1992)

Table VI.3 (continued)

Suğla Lake	Konya, Antalya	16.500 ha	(drought)	fresh water lake, wetland	No conservation statue
Bolluk Lake	Konya	1.100 ha	(drought)	salt lake, saltpans	NCA (1992)
Beyşehir Lake	Konya, Isparta	73.000 ha	38.500	fresh water lake	NCAA(1992), Beyşehir National Park, Kızıldağ National Parks, Drinking water reserve
Tuz Lake	Konya, Aksaray, Ankara	260.000 ha	166.500	salt lake, sparsely vegetated plain	NCA (1992), Special Environmental Protection Area (2000)
Ereğli Marshes	Konya, Karaman	37.000 ha	Small amount (18.500)	fresh water, reedy, marsh	NCA (1992), Nature Reserve
Eşmekaya Marshes	Aksaray	11.250 ha	(drought)	fresh water, salt lakes and reedy	NCA (1992), Wildlife Protection Area(1994-2005)
Hotamış Marshes	Konya	16.500 ha	(drought)	fresh water, small salt lake	NCA (1992)

(Source: Environmental Status Reports of Aksaray 2005, 34; Environmental Status Report of Ankara 2006, 32; Environmental Status Report of Isparta 2006, 21; Environmental Status Report of Karaman 2006, 28-31; Environmental Status Report of Konya 2006, 35-42; Özesmi, Tırpan, Uzel 2005, 2-3; Tüm Gazeteler, http://www.tumgazeteler.com accessed on May, 2008; WWF-Turkey Homepage, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/, accessed on April, 2008; Tokat Tema Vakfı, http://www.tokattema.org/index.php, accessed on May, 2008; Farkındamısınız.com, http://www.farkindamisiniz.com/haber.php, accessed on May, 2008; Ministry of Culture and Tourism, http://www.konyakulturturizm.gov.tr, accessed on May, 2008; WWF 2004, 21)

All these problems have negatively affected on the ecology of the basin. Several endemic bird species do not visit the Konya Closed Basin anymore, because the wetlands and lakes lost their importance. It should be mentioned that this is not only an

environmental problem, but it also has negative impacts on the economic activities in the region: Reed cutting activities have been affected negatively because of diminishing number of reeds. Fishermen in Beyşehir and Tuz Lake are looking for alternative jobs because number of fish species has decreased. There is also 40% decrease in the output of agricultural sector in 2007 due to drought problems of the basin (Dıvrak 2008, 165; Atlas 2007, 116-117; WWF Turkey 2005, 30-31; Özesmi, Tırpan, Uzel 2005, 5-6; Tüm Gazeteler, http://www.tumgazeteler.com, accessed on May, 2008; Atlas Dergisi, http://www.kesfetmekicinbak.com/gundem/06401/, accessed on April, 2008).

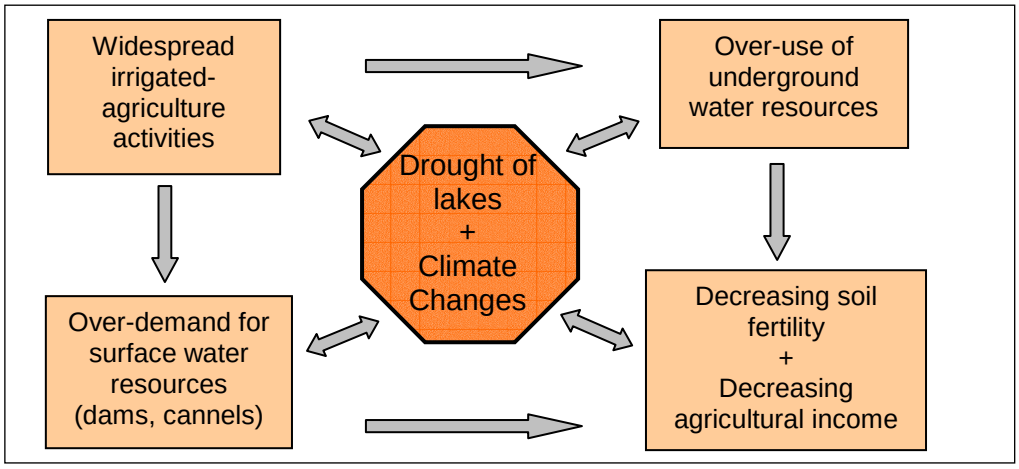


Figure VI.4: Circular Reasons of the Drought in the Konya Closed Basin (Source: Atlas Dergisi 2007a, 117)

Below, I will summarize the general profile of the Konya Closed Basin in Table VI.4

Table VI.4: General Profile of the Konya Closed Basin

Potentials	**Problems**	**Ecological and Economic Representations of Potentials and Problems**
Being biggest closed basin of Turkey with its several lakes and wetlands	Decreasing level of surface and underground fresh water resources due to unsustainable agricultural activities	Several endemic bird species do not visit the Konya Closed Basin anymore
Having unique water circulation system	Changing the natural flows of the lakes by dam constructions	Beyşehir Lake is no more the biggest fresh water lake of Turkey
Having alluvial and salty water characteristics	Drying of wetlands due to unsustainable economic activities	There is a threat of being unusable of the remaining amount of underground waters if not refined due to mixture of sulfide water and fresh water
Having 200 ecologically important areas –IBA, IPA, IHA, etc.	Pollution of all water resources due to discharging of wastes without making treatment	Reed cutting activities have been affected negatively because of diminishing number of reeds
Having 15 natural conservation areas	Changing of the basin's soil characteristics negatively due to chemical pesticides, domestic and industrial wastes, and overgrazing of animals	Fishermen in Beyşehir and Tuz Lake are looking for alternative jobs because number of fish species has decreased

Table VI.4 (continued)

Having rural area characteristics that generally depending on irrigated agriculture		There is 40% decrease in the output of agricultural sector in 2007 due to drought problems of the basin
Having several other economic activities: husbandry, fishing, reed cutting, industry (salt and sugar production)		

VI.2.2.2. The Aims of the Planning Process

The aim of the planning process was the achievement of a collective work of stakeholders and decision-makers for management and use of water resources with reference to the principles of the IWRM planning approach. In order to attain this goal, WWF-Turkey would be the facilitator between all stakeholders and decision-makers. (WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari, accessed on April, 2008). The four objectives were:

1. **Capacity-building for an effective and sustainable closed basin management process:** This aim consists of three main education programs that inform different stakeholders about the principles of IWRM and related issues:
    - Short-term courses on IWRM
    - On-line courses on IWRM
    - General information courses

I will give the detailed information about these education programs in Section VI.2.2.3.1.

2. **Increasing dialogue among stakeholders and partners of Konya Closed Basin and also among partners of the project:** This aim focuses on workshops in which different suggestions and opinions are discussed and shared between stakeholders. It also focuses on development of a mechanism to improve existing information capacity and provide information exchange between stakeholders. For these purposes the following actions were planned:
   - 'Stakeholder Analyses' to understand the willingness of stakeholders to participate to dialogue platforms
   - 'Hydrological Model' to balance the water level of the basin
   - 'Agricultural Analyses' which include irrigation at the basin scale, alternative products, Agricultural Common Policy of United Nation
   - 'Meetings and workshops'

3. **Development and implementation of pilot projects:** This includes performing of three pilot (catchment level) projects for nature conservation and sustainable development. The basin was divided into three sub-basins; and with the pilot projects in these sub-basins, it was planned to achieve economic, social and environmental developments by IWRM planning implementations. These pilot projects are:
   - Beyşehir Lake Pilot Project
   - Tuz Lake Pilot Project
   - Ereğli Marshes Pilot Project

4. **Increasing the public awareness about the significance of IWRM by using communication tools:** This aim includes awareness raising about the necessity for IWRM planning in Konya Closed Basin. To attain this aim the following actions were planned: Aim of this principle is making all stakeholders aware of the necessity for IWRM planning in Konya Closed Basin. For realizing this aim the following actions were planned:
   - Preparation of a brochure about aims and activities of the project
   - Preparation of a documentary film about the Konya Closed Basin
   - Constitution of virtual forums (e-mail group, interactive web site), where all stakeholders would share their knowledge and opinions with each other (WWF Turkey 2004, 37; WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari/projeler/konya-kapali-havzasinin-akilci-kullanimina-dogru/, accessed on April, 2008).

The Konya Closed Basin IWRM planning process is considered successful because all of these aims have been realized since 2003. However, since three of these aims –capacity building, increasing dialogue between stakeholders, increasing public awareness—need a dynamic and updated process, the activities related to them are still continued. Therefore, the successful outcomes of the planning process are not clearly observed; there are only small projects and activities that represent the increasing of public awareness about the plan. Meanwhile, the Tuz Lake Pilot Project was prepared in 2006, Ereğli Mashes Pilot Project has been just finished in 2008, and Beyşehir Lake Pilot Project is still being prepared.

VI.2.2.3. Organization of the Planning Process

One of the organizers of the Konya Closed Basin IWRM planning process, Mustafa Özgür Berke mentions that in the organization of the process, first of all, the experts of WWF-Turkey contacted with all institutions, organizations and people that could be the stakeholders of the project. Those, who were interested in the project, kept their contact with WWF-Turkey, and the capacity building process started. At the end of social capacity building activities (meetings, interviews and workshops, etc), these people achieved a common language for definition of the problems and their solutions. As a result, they became the stakeholders of the IWRM planning process with their supports and involvement. In brief, as Mr. Berke mentions, each of those stakeholders is one piece of a puzzle; if one of them had been absent, the all picture would never have been drawn completely.

However, a participatory planning process is not easily implemented; because there are stakeholder groups having different interests; and these interests may come into conflict with each other from time to time. Mr. Berke mentions that in the social capacity building activities, the stakeholders sometimes arrived at a consensus, while sometimes not. This is the very nature of the participatory approach: If, for instance, major stakeholders do not agree with a decision, implementation of that decision will become difficult or impossible. So in the face of the powerful groups, attainment of ideal participatory conditions is not always easy.

VI.2.2.3.1. Stakeholders of the Plan

As mentioned before, the Konya Closed Basin IWRM planning process started with analyses performed by WWF-Turkey, and was improved with contribution of the stakeholders –main partners and other stakeholders. Therefore, it can be regarded as one of the functional planning processes of Turkey in terms of participation of stakeholders at international, national and catchment levels:

- International Level Stakeholders: Turkey Netherlands Water Partnership, European Union.
- National Level Stakeholders: The State Planning Organization, Ministry of Environment and Forestry, Environmental Protection Agency for Special Areas, Ministry of Agriculture and Village Affairs, Ministry of Industry and Commerce, General Directorate of State Hydraulic Works, Ministry of Culture and Tourism, General Directorate of Mineral Research and Exploration, several professional chambers of Union of Chambers of Turkish Engineers and Architects, universities, national newspapers and televisions, WWF-Turkey, The Turkish Foundation for Combating Soil Erosion, Reforestation and Protection of Natural Habitats (TEMA), Doğa Derneği, Organic Product Producers and Industrialist Association (ORGÜDER).
- Catchment Level Stakeholders: Provincial Agricultural Directorships (Konya, Isparta, Aksaray), Konya Province Culture and Tourism Directorship, Provincial Environment and Forestry Directorships (Konya, Aksaray, Isparta), Konya Meteorology Regional Directorship, General Directorate of State Hydraulic Works 4th Region and 18th Region Directorships, The Foundation for the Promotion and Protection of the Environment and Cultural

Heritage (ÇEKÜL), Bird Research Society (KAD), The Society for the Protection and Improvement of Ereğli Mashes and Akgöl (ESKOD), local newspapers and televisions, Provincial Governorships, Municipalities Association (Konya, Isparta, Aksaray, Niğde, Karaman, Ankara), Offices of Kaimakam (Ereğli, Çupra, Karapınar, Beyşehir, Şarkikaraağaç, Eskil, Cihanbeyli, Kulu), Municipalities (Ereğli, Aksaray, Çupra, Karapınar, Beyşehir, Şarkikaraağaç, Eskil, Cihanbeyli, Kulu, Selçuklu, Meram), Konya Greater City Municipality, General Directorate of Konya Water and Wastewater Administration, Industrial Organization Zones, Konya Sugar Factory, Ereğli Sugar Factory, PankoBirlik (General Directorate, representative and senior organization of Beet Cooperatives), Provincial Command of Gendarmerie, Command of Environmental Protection Team, agricultural and water products co-operatives, irrigation associations, Ziraat Bank, Canon-Erkayalar Photography, Eti Food Industry and Trade Co. Inc., beet producer co-operatives, Managers of Tekel Saltpan, farmers, local people

In addition to these, in the catchment level projects the following stakeholders contributed to the process:

- Tuz Lake Management Plan: WWF-Turkey and Environmental Protection Agency for Special Areas are the main partners. The other partners are Ministry of Agriculture and Village Affairs, Ministry of Environment and Forestry, Ministry of Health, Ministry of Industry and Commerce, General Directorate of State Hydraulic Works, General Directorate of Mineral Research and Exploration, the Bank of Provinces, agricultural co-operatives, water products co-operatives, irrigation associations, building

offices of Kaimakam, municipalities, provincial governorships, several professional chambers of Union of Chambers of Turkish Engineers, Municipalities Association, Command of Environmental Protection Team, Universities, Konya Sugar Factory, Organic Product Producers and Industrialist Association (ORGÜDER), PankoBirlik, and Ziraat Bank (WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari/projeler/, accessed on April, 2008; Özesmi, Tırpan, Uzel 2005, 7-17; WWF-Turkey, http://www.wwf.org.tr/haberler/haberler/archive/2007/nisan/12/haber/tuz-goelue-daha-az-kirlenecek-daha-az-kuruyacak/, accessed on April, 2008; Environmental Protection Agency for Special Areas 2005, 9-15).

- Beyşehir Lake Management Plan: The main partners are WWF-Turkey and Ministry of Environment and Forestry. The other ones are Ministry of Public Works and Settlement, Ministry of Agriculture and Village Affairs, Province Environment and Forestry Directorships, General Directorate of State Hydraulic Works 4th Region Directorship, building offices of Kaimakam, municipalities, several professional chambers of Union of Chambers of Turkish Engineers, universities, agricultural co-operatives, water products co-operatives, irrigation associations, Organic Product Producers and Industrialist Association (ORGÜDER) (Özesmi, Tırpan, Uzel 2005, 7-17; WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari/projeler/, accessed on April, 2008; WWF-Turkey 2004a, 1-2).
- Ereğli Marshes Management Plan: The main partners are WWF-Turkey, Ministry of Environment and Forestry and The Society for the Protection and Improvement of Ereğli Mashes and Akgöl

(ESKOD). The other ones are Turkey Netherlands Water Partnership, European Union, Ministry of Agriculture and Village Affairs, Province Environment and Forestry Directorships, General Directorate of State Hydraulic Works, the Bank of Provinces, provincial governorships, building offices of Kaimakam, municipalities, universities, several professional chambers of Union of Chambers of Turkish Engineers, irrigation associations, Ereğli Sugar Factory, Ereğli Industrial Organization Zone (WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari/projeler, accessed on April, 2008; WWF-Turkey, http://www.wwf.org.tr/haberler, accessed on April, 2008; Ministry of Environment and Forestry, http://www.konyacevreorman.gov.tr/, accessed on May, 2008; Özesmi, Tırpan, Uzel 2005, 7-17).

The issues highlighted by these stakeholders in the meetings and workshops were explained in Table VI.5. According to this table, all kinds of stakeholders arrived at a consensus on the state of natural resources, water pollution and drought problems, because they have effect on the activities of them. However, the stakeholders expressed differentiating views in other issues with respect to their professional backgrounds. Especially, the issues related to the IWRM planning – conservation statutes and legal perspective, holistic approach, basin scale for management activities, monitoring activities— were not fully agreed upon due to the insufficient knowledge of stakeholders. This situation shows the necessity of capacity building activities during the planning process. It is also a good indicator of why the capacity building activities are mainly stressed in the literature of IWRM planning.

Still, this participatory process is a very important and functional example of the IWRM planning approach, and I will explain the benefits and difficulties of the process in Section VI.3.

Table VI.5: Issues Highlighted by Different Level Stakeholders in Konya Closed

Focus Issues / Stakeholders	Natural Resources	Water Pollution and Drought Problems	Irrigation Problems	Conservation Statues and Legal Perspective	Inter-disciplinary Approach	Holistic Approach	Education and Capacity Building Activities	Planning and Management activities	Basin scale for management Activities	Waste-water and Solid Waste Management Activities	Monitoring and Controlling Activities
International Organizations	√	√			√	√		√	√	√	
Governmental Institutions	√	√	√	√	√	√		√		√	√
Non-governmental Institutions	√	√		√	√	√	√	√	√		√
Private Institutions	√	√		√			√	√		√	
Universities	√	√	√		√	√	√	√	√	√	
Professional Chambers	√	√	√	√	√		√	√		√	
Local People	√	√	√				√			√	

(Source: Özesmi, Tırpan, Uzel 2005, 17-26; WWF-Turkey 2004d, 1-33)

VI.2.2.3.2. Social Capacity Building Activities

One of the main aims of the Konya Closed Basin IWRM planning process is to improve the local capacity in order to turn their environmental concerns and responsibilities into concrete actions. Social capacity building activities are the most important tools for increasing the quality of stakeholders' participation. These activities overcome the doubts of different governmental institutions about the efficient coordination of different stakeholders in this dynamic IWRM planning process (Dıvrak 2007, 166). As a result, these activities have been organized for five years in order to increase awareness, knowledge, understanding and ability of all stakeholders for their active participation in this process. The activities have included two main components: education activities and communication plans.

- **Education Activities**

Since in Turkey, a small percentage of population has an idea about the IWRM planning approach, it was a priority to organize various training courses in order to increase knowledge about it. With this aim, short-term and online courses on IWRM planning and other courses for catchment level implementations have been organized since 2004 (See Table VI.6). In these courses, generally, information about sustainable water resource management, EU standards, IWRM planning approach, participation, and sustainable agricultural applications were taught to participants from governmental institutions, NGOs, private institutions, universities and farmers by giving practical examples from other countries. Moreover, agriculture and underground water have been the focal issues of the courses due to the closed basin characteristic of the area.

Table VI.6: Education Activities Organized in the Konya Closed Basin IWRM Planning Process

Education Activities	Organizers (Partners)	Place	Time	Contents	Participators (Other Stakeholders)
Management of Water Resources and Watersheds in Turkey	WWF-Turkey	Konya	October 12-13, 2004	Water resource and watershed management in Turkey	46 people from governmental institutions, NGOs, private institutions, water co-operatives and associations
Agriculture and Environment through the being member of EU	The Ministry of Agriculture and Village Affairs	Ankara	April 26, 2005	Agriculture-environment-water	Governmental institutions, NGOs, private institutions, local institutions
Short-term course on IWRM	UNESCO-IHE Institute, WWF-Turkey	Antalya	January 22-29, 2006	Environmental effects of water resource planning and management, wise-use of watersheds, water framework directives of EU	15 staffs from governmental institutions, NGOs and universities
Cihanbeyli-Altınekin Irrigation Application Project	Selçuk University Cihanbeyli Vocational High School, Konya Province Command of Gendarmerie, Command of Environmental Protection Team, WWF-Turkey	Cihanbeyli, Altınekin	March 29, 2006	Wise irrigation and fertilization applications, production planning, sustainable agriculture and alternative agriculture models, wise-use of underground water resources, drip-irrigation method and its application	Provincial directorships of governmental institutions, NGOs, municipalities, Offices of Kaimakam, farmers

Table VI.6 (continued)

Project on Education and Application of Organic Agriculture	ORGÜDER and WWF-Turkey	Konya, Çumra, Beyşehir	March-April, 2006	Production planning, principles of organic agriculture, wise-use of agricultural pesticides, inspected and certificated production, modern production techniques, economic and wise irrigation techniques, cooperation of farmers and NGOs	Provincial directorships of governmental institutions, municipalities, universities, Konya Sugar Factory, other private institutions, association of agricultural engineers, farmers and related associations
Project on Micro-credit information for farmers	Development Study Center, WWF-Turkey	Çumra, Beyşehir	2006	Economic aspects of drip-irrigation method for farmers, environment and regional development, accessibility of credits for drip-irrigation applications	Ziraat Bank, Pankobirlik, other private institutions, farmers, local governmental institutions, NGOs
Project on determination of underground water level changes and its evolution	Konya Association of Geology Engineers and WWF-Turkey	Çumra, Altınekin, Karapınar, Kadınhanı	2006	Wise-use of underground water resources, modern agricultural activities regarded to water resources	Governmental institutions and farmers
Education about EU policies in Konya Closed Basin	Department of Environment Food and Rural Affairs (defra) and WWF-Turkey	Cihanbeyli, Konya, Isparta	July 23, 2006, Cihanbeyli	Historical process of EU, institutional structure of EU, legal perspectives of EU, relationships between Turkey and EU, EU rural	Governmental institutions, NGOs, municipalities, building Offices of Kaimakam, irrigation co-operatives,

Table VI.6 (continued)

Education about EU policies in Konya Closed Basin			October 10, 2006, Konya November 23, 2006, Isparta	development policies and Turkey, IWRM, Water Framework Directives of EU, Common Agricultural Policy, Environment Policy, Conservation Areas (Natura 2000, Directives for birds and habitats)	beet co-operatives, salt producers
Online Courses on IWRM	WWF-Turkey	http://www.wwfegitim.org	2006-2007	Problems in water resource and watersheds management, principles for wise-use of water resources, planning in basin scale, participation, establishment of basin commissions, methods for planning of big-scale water constructions	Governmental institutions, NGOs, universities, local institutions
Education activities for Ereğli Marshes Pilot Project	WWF-Turkey	Ereğli-Ayrancı, Antalya-Çıralı,	2006-2007	Sustainable reed harvesting, organic agriculture, modern irrigation methods, water-agriculture-environment relationship	Approximately 300 people from governmental institutions, NGOs, universities, local institutions, farmers
Pilot projects on drip-irrigation and education of farmers	Canon-Erkayalar Photography and WWF-Turkey	Kulu, Eskil	2006-2007	Economic and ecological advantages of the drip-irrigation method, credit system for drip-irrigation applications	180 farmers, irrigation co-operatives, beet co-operatives

Table VI.6 (continued)

Education activities for Tuz Lake Pilot Project	Environmental Protection Agency for Special Areas, General Directorate of State Hydraulic Works, Konya Province Agriculture Directorships, Konya Sugar Factory, Ziraat Bank	Aksaray-Eskil	March 29, 2007	Agriculture-water-environment relationship, water profile of Tuz Lake Sub-basin, alternative agricultural products, fertilization and water analyses, agricultural credits, drip-irrigation applications	Farmers, irrigation co-operatives, beet co-operatives

(Source: WWF-Turkey, http://www.wwf.org.tr/haberler/, accessed on April, 2008; WWF-Turkey 2004a, 2; WWF-Turkey 2007b, 2-6; WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari/basarilar/, accessed on April, 2008; WWF-Turkey 2004b, 1-13; WWF-Turkey 2004d, 1-32)

For five years, these education activities have increased public awareness about the problems of the basin and explained the participants' principles and methods of regional development while protecting the environment. In addition, the participants have also learned how to contribute to the IWRM planning process for sustainable development of the basin. As a result, by 2008, more than 2000 farmers use sustainable irrigation and production methods with financial supports of various partners from private and governmental institutions. Moreover, in the Konya Closed Basin, several governmental institutions are carrying out analyses and preparing plans about the Konya Closed Basin including underground water resources, hydrological model, production patterns, and sustainable irrigation methods. All of these improvements show that functioning outcomes have been achieved through the capacity building activities like increasing public awareness; although not all the targeted people participated in the planning and implementation process (WWF-Turkey 2007b, 1-6; Tüm Gazeteler, http://www.tumgazeteler.com/?a=2167655, accessed on May, 2008; WWF-Turkey 2004d, 1-13).

As observed in Table VI.6, these education activities were usually organized in local areas –Konya, Aksaray, Antalya, and Isparta—in order to achieve the implementation aims of the plan. Therefore, IWRM planning concepts, agriculture-water-environment relationship, agricultural production tools were became the related issues mainly discussed and learned in these activities. These activities were realized in a systematic order with the efforts of the coordinators; and stakeholders participated in the activities with respect to their professions. According to Mr. Berke, there is not enough information to evaluate whether the number of stakeholders participated in the

process was sufficient; but *an improved capacity* and *raised awareness* were observed in each person involved in the activities. Therefore, the education activities can be regarded as effective and functional from this point of view.

- **Communication Plans**

During the Konya Closed Basin IWRM planning process, communication plans have been the basic tools with education activities for capacity building, because they are considered more useful than other tools in creating a proper milieu to address IWRM planning issues. Moreover, although they are named as 'communication plan', they actually consist of various communication tools that are listed below:

- Meetings, professional workshops, activities
- Regional and technical tours (60.000 km around the basin)
- One-to-one contact with stakeholders
- Newspaper news, brochures, other printed manuals
- A documentary film called "From Water to Salt"
- Interactive web-based information system (active web site)
- E-mail groups and e-mail chats (WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari, accessed on April, 2008; WWF-Turkey, http://www.wwf.org.tr/haberler/haberler/archive/2006/agustos/04/haber/konya-kapali-havzasinin-akilci-kullanimina-dogru-projesi/, accessed on April, 2008; ; WWF-Turkey 2004a, 1-4).

For five years, all these communication plans have been realized simultaneously (See Table VI.7). Among them, meetings and professional workshops were the mostly applied ones, because it is very important to gather all related institutions and people around a table, and make them owners and stakeholders of the project. According to Mr. Berke, during these meetings and workshops, people who were not interested in the project were eliminated, and the improved capacity of attended people was clearly observed. He also added that as time passes, these attendees changed their roles from listener and spectator to an active “actor” by making suggestions and actions for solving the problems of the basin. It is important to note that this is not an easy process; because it needs a long time to make people eager to be an actor of the planning process. There may be groups who are not interested in a project, but who could strongly affect on the conditions of water resources through their economic and land-use activities. Therefore, an extra effort is needed to persuade these groups to be the stakeholders of the planning process.

Table VI.7: Meetings and Professional Workshops Organized within the Konya Closed Basin IWRM Planning Process

Meetings and Professional Workshops	Organizers (Partners)	Place	Time	Contents	Participants (Other Stakeholders)
Workshops on "Through the Wise Use of Beyşehir Lake Sub-basin" Project	WWF-Turkey	Ankara, Beyşehir -Konya	-February 11-12, 2004, Beyşehir -April 17, 2004, Beyşehir -November 5, 2004, Ankara -March 21-25, 2005, Beyşehir	Problems and potentials of the area, solution alternatives, responsibilities of related institutions and local people	Governmental Institutions, local institutions, NGOs, professional chambers, co-operatives and associations, universities
Konya Basin First Stakeholder Meeting	WWF-Turkey	Konya	May 12-13, 2004	Problems and potentials of the basin, solution alternatives, responsibilities of related institutions and local people	Governmental institutions, NGOs, private institutions, universities, professional chambers, co-operatives and associations, EU Commission, municipalities and Provincial Governorships
Workshop on "Through the Wise Use of Tuz Lake Sub-basin" Project	WWF-Turkey	Aksaray	July 6, 2004	Problems of Tuz Lake Sub-basin, solutions of these problems	40 people from 26 different governmental and non-governmental institutions

Table VI.7 (continued)

Workshops on Management Plan of Tuz Lake Sub-basin	WWF-Turkey, Environmental Protection Agency for Special Areas	Ankara, Aksaray, Konya,	-May 12, 2004, Konya -July 6, 2004, Aksaray -April 28, 2005, Ankara -May 16, 2005, Eskil-Aksaray -May 27, 2005, Altınekin-Konya -June 15, 2005, Ankara -July 27, 2005, Konya -November 29, 2005, Cihanbeyli-Konya -March 29, 2006, Cihanbeyli-Konya -February 12, 2007, Kulu-Konya	Tools, structure and stakeholders of the management process, problems and theirs solutions of the area, the management system, how the stakeholders involve in the process, capacity building activities	Governmental institutions, NGOs, private institutions, universities, professional chambers, co-operatives and associations, EU Commission, municipalities, greater municipalities and Provincial Governorships
First Symposium on National Underground Water Resources	General Directorate of Rural Services	Konya	December, 23-24, 2004	Consumption and management problems of underground water resources in Turkey, Konya Closed Basin IWRM process	Governmental institutions, NGOs, universities, professional chambers, municipalities
Meeting on EU Deliberations and Agriculture	The Ministry of Agriculture and Village Affairs	Ankara	February 5, 2005	Problems and potentials of Konya Closed Basin, Konya Closed Basin IWRM process	Governmental institutions, private institutions, NGOs, universities, municipalities

Table VI.7 (continued)

Meeting at Bilkent University	WWF-Turkey	Ankara	March 10, 2005	Problems and potentials of Konya Closed Basin, Konya Closed Basin IWRM process	Governmental institutions, NGOs, staffs, students
Meeting at Hacettepe University	WWF-Turkey	Ankara	March 11, 2005	Problems and potentials of Konya Closed Basin, Konya Closed Basin IWRM process	Governmental institutions, NGOs, staffs, students
Meeting at Tekirdağ University	WWF-Turkey	Tekirdağ	April 20, 2005	Problems and potentials of Konya Closed Basin, Konya Closed Basin IWRM process	Governmental institutions, NGOs, staffs, students
Workshops on Watersheds Management Plan	WWF-Turkey, Ministry of Environment and Forestry	İzmir	May 25-28, 2005	Problems and potentials of watersheds in Turkey, Konya Closed Basin IWRM process	Governmental institutions, private institutions, NGOs, universities, municipalities
Meeting on Introduction of Biological Diversity of Ladik Lake	WWF-Turkey	Ladik-Konya	May 29-30, 2005	Problems and potentials of Ladik Lake, Konya Closed Basin IWRM process	Governmental institutions, private institutions, NGOs, universities, municipalities
Professional Meeting on Kelkit Basin Development Association	Kelkit Basin Development Association	Tokat	August 5-7, 2005	Problems and potentials of Konya Closed Basin, Konya Closed Basin IWRM process	Governmental institutions, private institutions, NGOs, universities, professional associations

Table VI.7 (continued)

Meeting for decision-makers	WWF-Turkey	Ankara	December 13, 2005	Problems and potentials of Konya Closed Basin, solutions of these problems	15 deputies from Konya, Aksaray and Karaman
Meeting for sharing of watershed management experiences in Turkey	WWF-Turkey	Isparta	April 10-11, 2006	Different watershed management experiences in Turkey, definition of lessons learnt from these experiences	Governmental institutions, NGOs, universities, professional associations
Meeting on projects prepared for Konya Closed Basin in three years	WWF-Turkey	Konya	June, 2006	Different projects prepared for Konya Closed Basin for three years; principles, implementations and stakeholders of these projects	Governmental Institutions, NGOs, universities, parliamentarians
Meeting on Ereğli Sub-basin Management Plan	WWF-Turkey	Ereğli-Konya	July 6-8, 2006	Vision of Ereğli Sub-basin Management Plan, general principles of the strategic action plan for the area	Governmental institutions, NGOs, private institutions, universities, professional chambers, co-operatives and associations, EU Commission, municipalities, greater municipalities and Provincial Governorships

Table VI.7 (continued)

Meeting on EU Policies Education Activities	WWF-Turkey	Cihan-beyli-Konya	July 18, 2006	Agricultural, water and environmental policies of EU	Governmental institutions, private institutions, municipalities, Kaimakams, co-operatives and associations
Meeting on wise use of water in agriculture	WWF-Turkey, Canon-Erkayalar Photography	Konya	April, 2007	examples from Konya Closed Basin about water saving in agriculture, related examples from abroad	Governmental institutions, private institutions, municipalities, co-operatives and associations, farmers
Meeting on facilities against effects of global warming	General Directorate of Konya Water and Wastewater Administration, Konya Municipals Association	Konya	November, 2007	Environmental and economic effects of global warming, measures taken against these effects	General Directorate of Konya Water and Wastewater Administration, related municipalities, students
Meeting on results of all studies about watersheds and underground water resources	WWF-Turkey	Konya	January, 2008	Results of all studies about watersheds and underground water resources, management principles related to these results	Governmental institutions, NGOs, universities, local people

Table VI.7 (continued)

Workshops on local governments in Tuz Lake Sub-basin	Selçuk University Cihanbeyli Vocational High School, Cihanbeyli Municipality	Cihan-beyli-Konya	April, 2008	Action plans of municipalities in Tuz Lake Sub-basin	Universities, municipalities and deputies
Conference on Konya Closed Basin underground water resources and drought	IV. General Directorate of State Hydraulic Works	Konya	September 11-12, 2008		Governmental institutions, NGOs, universities, professional chambers

(Source: ; WWF-Turkey 2004a, 1-4, WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ne-yapiyoruz/su-kaynaklari, accessed on April, 2008; WWF-Turkey 2004a, 1-4; WWF-Turkey 2004d,1-37; WWF-Turkey 2004b, 1-14; WWF-Turkey 2006a, 1-2; WWF-Turkey 2004a, 1-4; WWF-Turkey, http://www.wwf.org.tr/haberler/, accessed on April, 2008; General Directorate of State Hydraulic Works, http://www.dsi.gov.tr/bolge/dsi4/konferans/index.htm, accessed on April, 2008; Tüm Gazeteler, http://www.tumgazeteler.com, accessed on May, 2008)

Besides these meetings and workshops, the communication plans organized since 2003 are:

- 2003-2006: Several national and local media institutions explained the problems of the Konya Closed Basin and solutions. More than 200 newspapers and reviews published news about the IWRM planning process. The organizers of the plan were invited to approximately 50 television and radio programmes (WWF-Turkey 2004a, 4).
- 2004: WWF-Turkey participated in the 7th Salt Festival in Şereflikoçhisar, Ankara; organized the World Water Day Activities in Beyşehir; supported the Konya Province Environment and Forestry Directorship for the World Environment Day Activities in Konya; prepared brochures about the Konya Closed Basin IWRM planning; and established the Konya Closed Basin e-mail group.
- 2004-2005: WWF-Turkey organized the meetings on water with Sunay Demircan, Osman Erdem, Tansu Gürpınar, Özgün Emre Can, Atila Uras for people interested in water resources
- 2005: WWF-Turkey participated to Gölyazı Environment Activities in Aksaray
- 2006: With the sponsorship of Garanti Bank and Laser Institution, WWF-Turkey prepared and broadcasted a documentary film about the project called *From Water to Salt* (WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda/ne-yapiyoruz/, accessed on April, 2008; WWF-Turkey 2004a, 1-4).

In addition to these, in the website and e-mail groups, news from the basin, suggestions and solutions are still discussed by stakeholders. Brochures and CDs about the process are also distributed to the people who are interested in it.

All of these activities prove that the Konya Closed Basin IWRM planning process has been functioning in capacity building; although stakeholder sometimes conflicted with each other. In the end, stakeholders managed to create a common language about the problems and their solutions. An impressing example about this is the problem created by the excessive water demands of sugar beet and potato productions in the Basin, which are used by the Konya Sugar Factory and Chips Factory respectively. According to Mr.Berke, it is impossible to change the production pattern, while these factories influence on the economical income of the region. Therefore, the consensus was attained through deciding to change the irrigation methods instead of the production pattern; and since then, Konya Sugar Factory has supported all the communication plans about using sustainable irrigation methods. Moreover, Mr.Berke also mentions that another conflicting situation emerged between people who want to protect Ereğli Marshes' ecosystem and the General Directorate of State Hydraulic Works, because the dam constructed in the area affects on the ecosystem of the Ereğli Marshes negatively. This problem has been tried to be overcome by including the General Directorate of State Hydraulic Works in the Ereğli Marshes Management Planning process.

The capacity building activities of the process can be regarded efficient and effective, because as the theory suggests, the IWRM planning process in the Konya Closed Basin has been realized as a dynamic process that is still continued and updated by stakeholders, although most of the activities and pilot projects were finished. Since the stakeholders' awareness were raised, different stakeholders from local governmental and non-governmental organizations, private institutions, universities and local people still organize meetings and

workshops about various issues related to the Konya Closed Basin. Moreover, recently, some private institutions –Canon-Erkayalar Photography, Eti Burçak—and Ziraat Bank are financially supporting the plan implementation activities.

VI.2.2.4. Catchment Level Projects

Three catchment level projects have been prepared in the sub-basins of the Konya Closed Basin within the IWRM planning process: Tuz Lake Management Plan, Beyşehir Lake Management Plan and Ereğli Marshes Management Plan. Mr. Berke states that it would be more proper to call these management plans as “wetland management plans”, because although all planning activities were performed at the basin scale (which is a larger scale), approval of these projects was constrained to the wetland scale due to the inadequacies of the related legislation in Turkey.

Tuz Lake Management Plan was approved in the mid 2008; Ereğli Mashes Management Plan was finished and is waiting for approval; and Beyşehir Lake Management Planning Process is still continued.

In the following chapter, I will explain the Tuz Lake Management Planning Process, since this plan is supposed to pioneer to the Konya Closed Basin IWRM plan with its management and planning tools. Moreover, it is a functioning example of environmental protection with its participatory planning approach, local focus and transparency principle. Besides, it is the only completed catchment level project as an example of IWRM planning practices (WWF-Turkey 2004b, 5-6; Dıvrak 2008, 166; WWF-Turkey 2007b, 3).

VI.2.2.4.1. Tuz Lake Management Planning Project

In order to launch the feasibility analyses with respect to the environmental agreement signed between Turkey and Spain, the Environmental Protection Agency for Special Areas selected the Tuz Lake Sub-basin due to its economically important and unique water, and drought and pollution problems; and declared it as a Specially Protected Area in 2000. Sezer Göktan, one of the coordinators of the project from the Environmental Protection Agency for Special Areas actually wanted to declare the entire Konya Closed Basin as a Specially Protected Area, but its legal authority and capacity was not adequate for the management of this much wider scale.

The planning process, which started with these feasibility analyses, was finished in 2007 with the preparation of the ‘Landuse Plan’ that synthesized different connected projects. The Tuz Lake Management Plan, which was started in 2003 with the supports of WWF-Turkey, is the most important part of this synthesis with its participatory planning process and capacity building approach.

This planning process is summarized below in Figure 6.5:

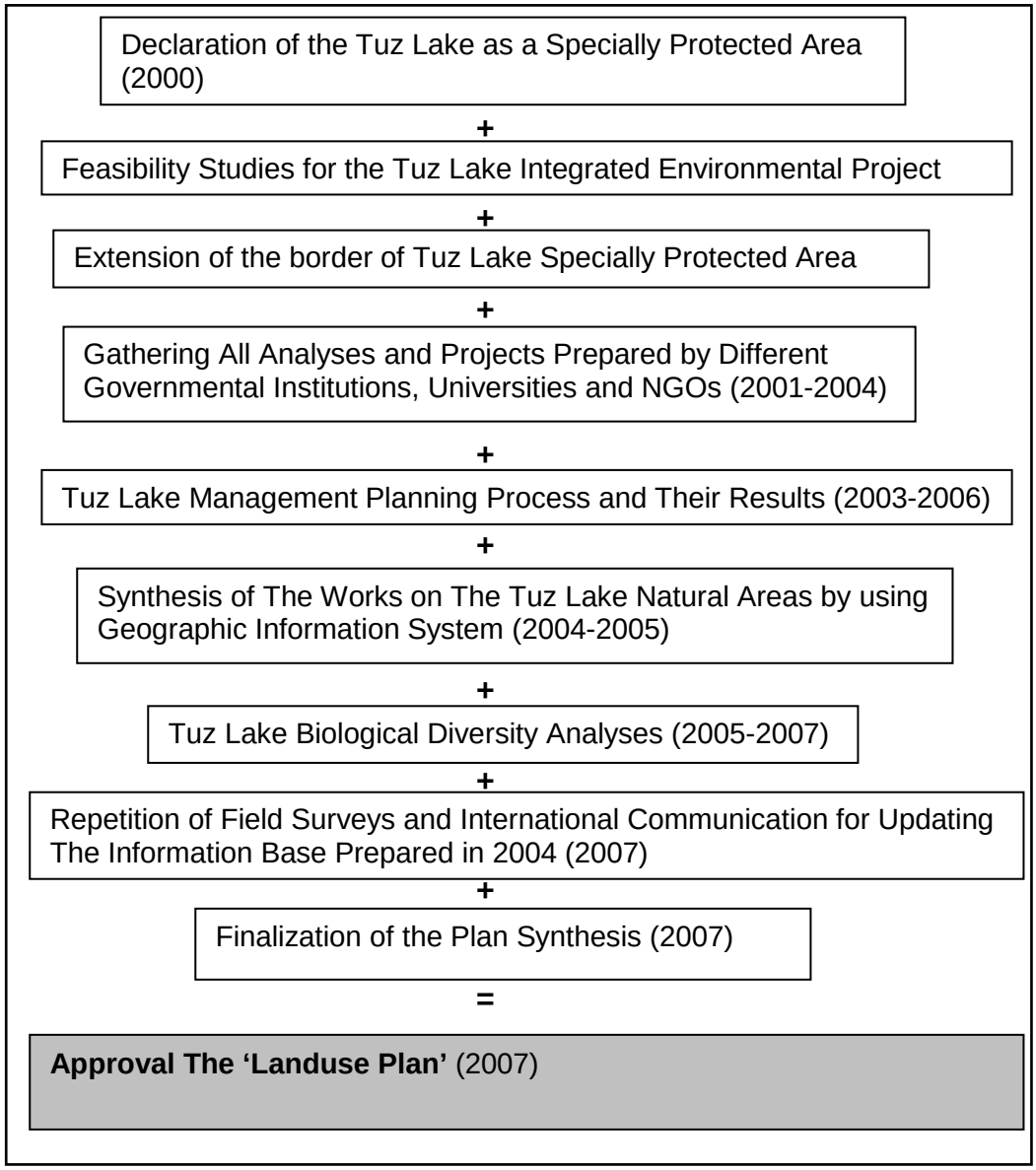


Figure VI.5: The Tuz Lake Environmental Master Plan Planning Process (Source: Erdoğan 2008, 1)

- **Description of The Tuz Lake Sub-basin:**

Tuz Lake is an important natural resource for Turkey with its salt reserve and biodiversity. Moreover it is an IHA[40], IBA and IPA. It covers an area of 1.300 km² and its sub-basin covers an area of 20.000 km² locating in the boundaries of Ankara, Konya and Aksaray provinces. It is also one part of the Konya Closed Basin's water systems as the ending and turning –from water to salt—point of the water circulation. Furthermore, it has been declared as the largest Specially Protected Area in Turkey in 2000 (WWF-Turkey 2005, ii; WWF-Turkey 2004a, 2; WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda, accessed on April, 2008).

The sub-basin has very crucial natural characteristics with its wetlands, bird species and endemic plants. It has several wetlands interrelated to each other: Kulu Lake, Samsam Lake, Uyuz Lake, Kozanlı Lake, Bolluk Lake, Tersakan Lake, Eşmekaya Lake and Hirfanlı Dam. Since all these wetlands have different characteristics, they are the habitats of various bird and plant species. Moreover, Samsam Lake, Kozanlı Lake, Gökgöl, Kulu Lake, Tersakan Lake, Old Eşmekaya Marshes and Tuz Lake have the status of international IBA; and more than 20 kinds of endemic plants grow around Tuz Lake. Tuz Lake has also the status of First Degree Natural Protected Area and "A" class international wetland (WWF-Turkey 2005, 3-6).

The main economic activity of the sub-basin is salt and agricultural production, and other activities are husbandry and reed cutting. The area meets 80% salt need of Turkey. Moreover, wheat, barley and

[40] Important Habitat Area (Önemli Habitat Alanı)

sugarbeed production is the main agricultural production (WWF-Turkey 2005, ii; WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda accessed on April, 2008).

As a result of unsustainable practices and policies coming from the past, the natural characteristics of Tuz Lake sub-basin are under several threats. These threats can be listed as drought of the lakes, decreasing underground water level due to the uncontrolled and overuse of water in agriculture, discharge of domestic and industrial wastes into the lakes without treatment, lack of integrated policies and practices in ecosystem conservation (WWF-Turkey 2005, ii; WWF-Turkey 2004a, 2).

- **Management Plan of The Tuz Lake as a Specially Protected Area:**

In order to find solutions to the problems of Tuz Lake sub-basin and to protect its natural resources, it is crucial to sustain the coordination and platform established among related public authorities, national and local NGOs, municipalities and Authority for Specially Protected Areas[41]. Developing some local subsidies and incentives for spring and drip irrigation systems, production factors and practices especially on water use, increasing the capacity building activities in organic agriculture and preparing the grassland and pasture management plans are some of the issues that are emphasized in terms of agriculture. It is also compulsory to build water treatment plants to prevent the pollution created by domestic and industrial wastes. In addition to these, it is very important to have awareness

[41] Özel Çevre Koruma Kurulu, Ulusal Sulak Alan Komisyonu, Yerel Sulak Alan Komisyonu

raising activities in order to protect the wild life and the ecological systems within the existing and planned projects in the sub-basin (WWF-Turkey 2005, ii).

Depending on these issues, the Tuz Lake Management Plan was prepared with concrete and transparent activities by the coordination of Environmental Protection Agency for Special Areas[42], whereas WWF-Turkey was the main partner (WWF-Turkey 2004a, 2). The plan was prepared between 2004 and 2006 with participation of various stakeholders (private institutions, governmental institutions, NGOs, and universities) in the meetings organized in different districts –Aksaray, Ankara, Eskil, Altınekin, Konya and Cihanbeyli. In these meetings, local people discussed and shared their problems and solution suggestions with the experts of governmental institutions, NGOs and universities. Then, these suggestions were translated into activities and gathered in the management plan and started to be implemented. As a result, the sub-basin, where none of the stakeholders had known each other before October 2003, achieved a feasible and participatory management plan in 2006. However, according to Mrs. Göktan, since there is no institutional system that coordinates and controls the implementation and evaluation activities and sustains financing of these activities, the related implementations are very little in number, although the planning process has been an effective and functioning one. She thinks that, the number of the implementations will gradually increase by the efforts of Environmental Protection Agency for Special Areas; and if an institutional system is established for water-basin areas, the number of them will increase in a shorter time period (WWF-Turkey

[42] Özel Çevre Koruma Kurulu

2004a, 2-3; WWF-Turkey, http://www.wwf.org.tr/wwf-tuerkiye-hakkinda, accessed on April, 2008).

- **Aim, Stakeholders and Planning Process:**

The aim of Tuz Lake Specially Protected Area Management Plan is definition of sustainable development and protection principles in terms of holistic management approach at the basin scale; forming an appropriate management model for the implementation of the plan; and implementation of the defined activities (Environmental Protection Agency for Special Areas 2005, 8).

The coordinator of the plan was the Environmental Protection Agency for Special Areas and the main partner was WWF-Turkey. The other stakeholders of the plan were mentioned in Section VI.2.2.3.2. Moreover, as Mrs. Göktan mentions, the committees, which have been mentioned in literature review in Section III.2.3., were organized with the involvement of these stakeholders; but they did not have any institutional and legal identity due to the inadequacies of related legislation in Turkey. Therefore, they were organized as 'Informal Platforms' by the coordination of Environmental Protection Agency for Special Areas in a regular time period.

The planning process was performed with several meetings organized in different cities. The aims of the process were 1) collection and evaluation of all related analyses, studies, development plans and application plans prepared by different governmental institutions, NGOs and universities; 2) planning of the entire area; 3) participation of all financial, technical and

administrative stakeholders while preparing the management plan and implementing its action plans (Environmental Protection Agency for Special Areas 2005, 8).

This process was summarized below in a chronological order:

Meetings for evaluation of the existing situation and problem identification: In the meetings organized in Konya, Aksaray and Ankara (May 12, 2004 Konya; June 6, 2004 Aksaray; and April 28, 2005 Ankara), all studies and projects realized by governmental institutions, NGOs and universities until 2005 were presented. Then, problems of the sub-basin and their solutions were discussed with regard to these presentations. As a result, three sub-committees were constituted:

1) Pollution, infrastructure and threats,
2) Land-use and planning
3) Administration/Committee models

Meeting on May 16, 2005 Eskil-Aksaray: Main titles of the management plan and actions performed by the related stakeholders were identified with respect to the issues formed by the sub-committees in the previous meetings.

Meeting on May 27, 2005 Altınekin-Konya: Actions identified in Eskil meeting were detailed in terms of their stakeholders, finance and time intervals.

Meeting of The Superior Advisory Committee on June 15, 2005 Altınekin-Konya: Actions identified in Eskil and Altınekin were evaluated and finalized by the Superior Advisory Committee before

the meeting organized for decision-makers. Moreover, the financial partners clearly declared their financial commitments for the necessary (basic) projects.

Public Hearing Meeting on July 22, 2005 Konya: This meeting was organized for announcing the Tuz Lake Management Plan to public. Principles, decisions and the basic projects of the plan, which was prepared with respect to the outputs of the previous participatory meetings, were explained by Osman Pepe, the then Minister of Environment and Forestry, to all related institutions, organizations and people

Meeting on November 29, 2005 Cihanbeyli-Konya: Following four groups were established by giving them to different responsibilities for realization of the actions decided in the previous meetings:

1. Scientific Advisory and Project Development
2. Social Capacity Building and Participation
3. Agricultural Production and Water Consumption
4. Monitoring and Controlling Group

Meeting on March 29, 2006 Cihanbeyli-Konya: Participants shared their opinions about agriculture-water relationship with Cihanbeyli District Agricultural Directorship. Issues about chemical pesticides, harmful insects, organic agriculture and alternative production pattern were discussed. Moreover, applications of spring and drip irrigation methods for sugarbeed production were explained by Selçuk University Cihanbeyli Vocational High School.

Meeting on February 12, 2007 Kulu-Konya: This meeting was organized for the evaluation of the planning process. All responsible

institutions explained their works to be realized in a one-year period. Moreover, two group meetings –Water Management-Agriculture Relationship Group and Education Group- were organized; and in these meetings, arrived point and future plans were focused. It was also observed that education activities about water management and agriculture were necessary for capacity building in the region. As a result, two agricultural training courses were organized in Konya and Aksaray in 2007 –March 29, 2007 Eskil-Aksaray and May 31, 2007 Zincirlikuyu-Konya (Environmental Protection Agency for Special Areas, http://www.ockkb.gov.tr/TR/Icerik.ASP?ID=169, accessed on May, 2008; Environmental Protection Agency for Special Areas 2005, 8).

This planning process is still going on with various capacity building, planning, implementing, monitoring, and evaluating activities of different stakeholders. The process is very important to have raised the awareness about the problems of the sub-basin and defined the plan principles in a participatory manner. It can be considered more efficient at the implementation stage because as the owners of the project, all stakeholders performed them with decision makers. However, the related outcomes have been attained very slowly due to the lack of an institutional system that coordinate, control and finance the implementation activities.

- **Components of the Plan:**

The components of the plan include the main projects, management scheme, and actions of sub-groups defined in the management scheme. The nine main projects, their partners and scopes are defined in Table VI.8.

Table VI.8: Main Projects Included in the Tuz Lake Management Plan

The Group Responsible for the Project	Name of the Project	Partners of the Project	Scope of the Project
Agricultural Production and Water Consumption	Preparation and Implementation of Agricultural Master Plan	Environmental Protection Agency for Special Areas, Ministry of Agriculture and Village Affairs, General Directorate of Agricultural Production and Development (TUGEM[43]), General Directorate of Agricultural Research (TAGEM[44]), Provincial Agricultural Directorships, WWF-Turkey Agricultural Project Department	-Bringing the project on definition of alternative agricultural implementations and classification of soil and land quality in Tuz Lake Specially Protected Area, studies about alternative agricultural production and Provincial Agricultural Plans together in order to prepare Agricultural Master Plan -Realization of all agreements and financial coordinations for implementation of the plan
Scientific Advisory and Project Development	Preparation and Implementation of Water Resources and Water Management Plan	Environmental Protection Agency for Special Areas, General Directorate of State Hydraulic Works, Provincial Village Affairs Directorships, General Directorate of Organization and Support[45]	-Preparing and implementing the pilot projects with coordination of Environmental Protection Agency for Special Areas and participation of all relate institutions - Examining the balance of all water resources effect on the basin, their rezervuar volumes, inventory of the well, existing situation of water distribution, irrigation systems, and controlling of wells
Agricultural Production and Water Consumption	Pilot Implementation for Pasture Improvement, Support of Producers about Alternative Production and Animal Husbandry	Environmental Protection Agency for Special Areas, General Directorate of Agricultural Production and Development (TUGEM), General Directorate of Agricultural Research (TAGEM)	-Planning and improvement of the defined pastures in Aksaray Pilot Area. -Preparation of “Framework Protocol” for supporting of producers about alternative production pattern and animal husbandry

[43] Tarımsal Üretim ve Geliştirme Genel Müdürlüğü
[44] Tarımsal Araştırmalar Genel Müdürlüğü

Table VI.8 (continued)

Agricultural Production and Water Consumption	Pilot Implementation for Development of Irrigation Methods and Support of Irrigation Cooperatives	Environmental Protection Agency for Special Areas, General Directorate of State Hydraulic Works, Ziraat Bank, PankoBirlik, General Directorate of Agricultural Production and Development (TUGEM)	-Definition a support model about development of irrigation methods in Aksaray Pilot Area -Preparation of a protocol with stakeholders in order to start drip-irrigation application in the pilot area where the irrigation infrastructure were constructed
Scientific Advisory and Project Development	Construction and Operation Supports of Domestic Wastewater Treatment and Solid Waste Storage Systems	Environmental Protection Agency for Special Areas, The Bank of Provinces, Municipalities, Offices of Kaimakam, Ministry of Industry and Commerce, The Scientific and Technological Research Council of Turkey (TUBİTAK[46])	-Revision of existing wastewater treatment systems of Aksaray and Şereflikoçhisar -Preparation of projects on Kulu and Cihanbeyli wastewater treatment systems; and obtaining the necessary financial supports for their constructions -Preparation of projects on artificial wetland areas management and domestic wastewater treatment with partners of TUBİTAK
Scientific Advisory and Project Development	Construction of Wastewater Treatment Systems in Organized Industry Zones	Environmental Protection Agency for Special Areas, Ministry of Industry and Commerce, Konya and Aksaray Municipalities	-Preparation and implementation of project on wastewater treatment system in Organized Industry Zones in Konya and Aksaray in order to prevent the basin from negative effects of these industry zones

[45] Tarımsal Teşkilatlanma ve Destekleme Genel Müdürlüğü

Table VI.8 (continued)

Social Capacity Building and Participation	Studies for Education and Capacity Building	Environmental Protection Agency for Special Areas, NGOs, Provincial Directorships of related Ministries (Ministry of Environment and Forestry and Ministry of Agriculture and Village Affairs), Command of Environmental Protection Team, Irrigation Cooperatives, Producer & Agricultural Associations, Municipalities	Organization of continuous education activities to related stakeholders about natural conservation, wise use of water, irrigation methods, animal husbandry, sustainable grazing, milk quality, and fodder production
Monitoring and Controlling Group	Monitoring Studies	Environmental Protection Agency for Special Areas, General Directorate of Meteorology, The Bank of Provinces, General Directorate of ı ral Research and Exploration, , Gene Directorate of State Hydraulic Works, NGOs, Municipalities, Provincial Governorships	Starting the monitoring studies about pollution, species, and their habitats with coordination of related institutions
Scientific Advisory and Project Development	Planning and Pilot Implementation of Natural and Cultural Tourism Potentials	Environmental Protection Agency for Special Areas, Provincial Tourism Directorships, Municipalities, NGOs, Association of Turkish Travel Agencies, Press and Publication Institutions	-Definition of natural and historical areas in the basin for tourism activities - Preparation of tourism map of the basin -Advertising of the basin with support of press and publication institutions

(Source: Environmental Protection Agency for Special Areas 2005, 9-11)

[46] Türkiye Bilimsel ve Teknolojik Araştırma Kurumu

Examining the table, it is observed that all issues –water management, agricultural activities, alternative agricultural protection, irrigation methods, tourism activities, wastewater and solid waste management tools, education and capacity building activities, monitoring— which influence on the water system of the basin were mentioned in these projects. Moreover, inter-sectoral coordination was mainly emphasized due to the complex structure of this water system. Financial supports and education activities were also highlighted in order to define how the projects would be implemented. The multi-actor characteristics of the projects and their scopes clearly show the necessity of the **integrated** and **participatory** approach in management of this kind of complex systems (regional or basin scale) for sustainability and wise-use of water resources.

In addition to these, *the importance of the local authorities* in maintaining the local awareness about plan implementations is one of the main outcomes of the meetings (Environmental Protection Agency for Special Areas 2005, 12). Mr. Berke emphasizes the crucial role of the local institutions and NGOs for implementing and updating the plan. Therefore, the management scheme was formed by foregrounding the local authorities as shown in Figure VI.6.

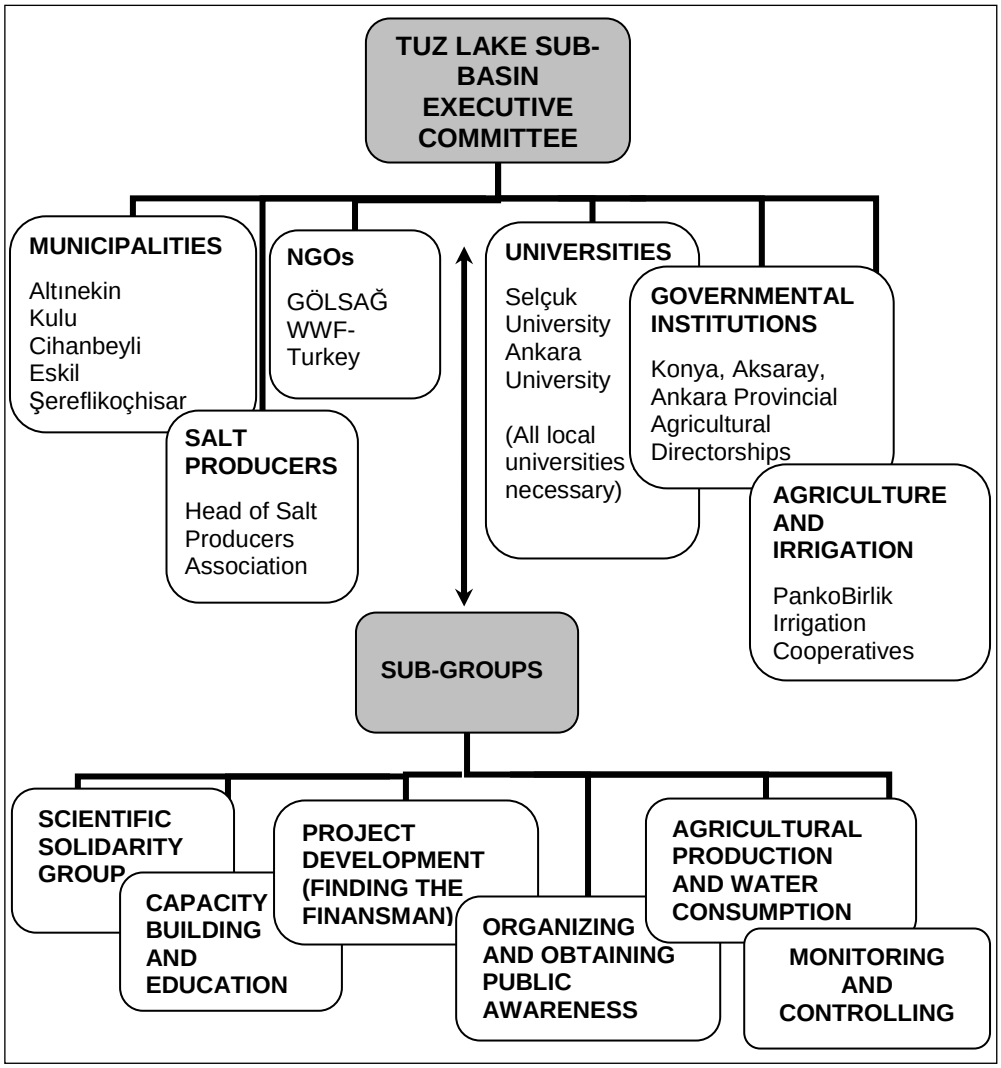


Figure VI.6: Management Scheme for The Tuz Lake Management Plan (Source: Environmental Protection Agency for Special Areas 2005, 12)

In the plan principles, actions of the sub-groups were also identified depending on the management scheme. They are generally classified in terms of conservation areas, agricultural and animal husbandry facilities, water pollution, decreasing of underground water level, and wise use of water resources (Environmental

Protection Agency for Special Areas 2005, 13-15). These five subjects represent the problems of the sub-basin, which were discussed in the meetings. In other words, these actions were determined through a participatory approach for solving the problems of the basin.

In conclusion, since then, the planning process has been carried out in a strategic, goal-oriented, inter-sectoral, and participatory approach in the direction of these plan principles; however it cannot be considered a holistic and systematic one, due to the lack of an institutional system that coordinates and controls this process. This situation has caused failures in implementation and evaluation activities, even if the plan was prepared in a participatory manner.

- **Stages of the Process:**

As mentioned in Section III.3.3.3, the literature defines four stages at the catchment level projects for a successful IWRM planning implementation:

1. Initiation (assessment and problem identification)
2. Planning (plan development)
3. Implementation (making a difference)
4. Evaluation and Monitoring (consider whether we make it or not)

Depending on the literature review, I have attempted to periodize the process with its stakeholders as follows:

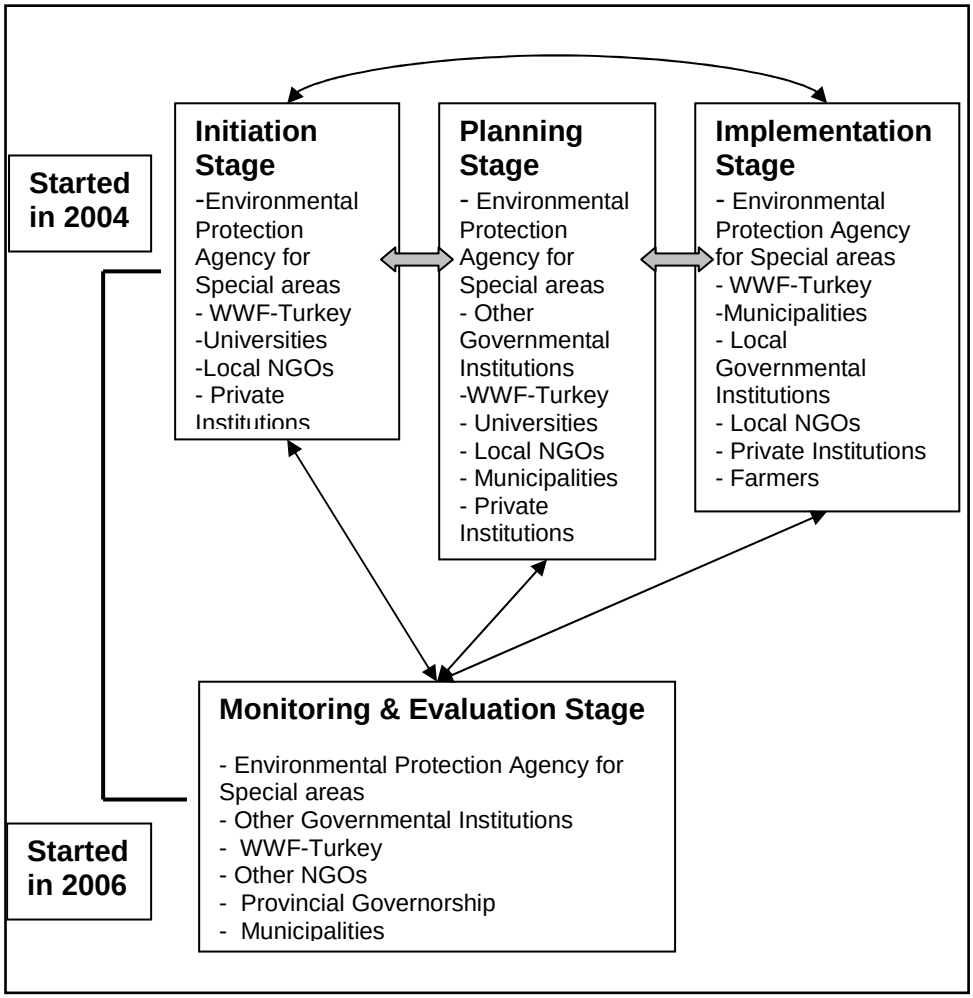


Figure VI.7: Stages of the Tuz Lake Management Plan with its Stakeholders

The "*initiation stage"* consists of analyses, education activities, and meetings and workshops organized for assessment and problem identification. Then, the *"planning stage"* includes definition of plan principles –plan decisions and the management scheme—, and preparation of "Synthesis Plan" by using all sub-plans and projects related to this plan. This Synthesis Plan is very crucial since it included all the analyses and plans mentioned above with the

participation of all related institutions from different sectors. Although Tuz Lake Sub-basin is a complex system with its endemic flora and fauna, IBA, IPA, soil characteristics, surface and underground water resources, wetlands, and lake systems; the analyses and planning studies had been carried out through a piecemeal approach by different sectors for years. Therefore, this plan is very important since it represents an "integrated" approach in water management planning. The "*implementation stage"* consists of action plans, training facilities and other activities for implementation of the plan decisions. Moreover, Mrs. Göktan states that since there is not an institutional system like 'Basin Committee' in the related legislation in Turkey, Environmental Protection Agency for Special Areas has coordinated the *"monitoring and evaluation"* studies with the participation of related stakeholders since 2006. These studies include meetings and workshops organized by the Agency. However, in Turkey, they have no legal bounding for controlling of IWRM studies and this stage was realized with the efforts of the coordinator institution.

In conclusion, since 2004, all stages of the plan have been realized simultaneously (See Figure VI.7). Moreover, each completed stage has been updated by going back to previous stages due to sustainable and dynamic characteristics of the plan. Therefore, Tuz Lake Management Plan is assumed as a functioning example of IWRM Planning Catchment Level Projects in terms of its planning process as representing most of the general principles of IWRM planning – strategic, participatory, capacity building, goal-oriented, adaptive management and water as an economic good approach— that explained in the literature review in Chapter III. However, it is difficult to say that the project has had the expected outcomes

because since planned area is very huge, it takes too long time to attain a balance between development and water resource protection. Moreover, as mentioned before, there are some failures in implementation and evaluation activities due to the lack of an institutional system in Turkey that coordinates, controls and finances the IWRM planning process at the basin scale.

VI.3. Evaluation

The Konya Closed Basin is a huge and complex area with its important natural areas, underground and surface water resources, soil characteristics, lakes, wetlands and unique water circulation system. However, since 2003, the Konya Closed Basin IWRM planning effort has proved to be efficient, effective, and functioning in terms of its dynamic and participatory process, which includes different stakeholders, sectors, administrative and legal structures. Furthermore, social capacity building activities and the catchment level projects are the main planning achievements in this process.

Throughout the social capacity building activities, the national and local awareness — especially of related institutions, local people, and media— about the IWRM planning approach, and problems and potentials of the Basin were raised. According to the report of the meeting, namely the ”Konya Closed Basin Stakeholder Meeting”, organized by WWF-Turkey before the IWRM project, stakeholders had a general opinion about the potentials and problems of the Basin; and they also had specific knowledge about different aspects of the Basin which derived from their professional experiences. However, these knowledges were not interconnected to each other; and this project gave all the related institutions the opportunity of

sharing their knowledge and acting collectively. Therefore, the stakeholders have been supporting the project for five years in different stages with regard to their professions; even if it is not an easy process due to the conflicting interests (See Table VI.4).

All kinds of planning and management activities were performed through a capacity building and participatory approach. Stakeholders participated in different social capacity building activities organized in several cities. It should be noted that non-governmental organizations generally involved in all the stages of the IWRM planning process. However, governmental institutions and universities involved in planning and monitoring stages; and a few of them also supported some implementation activities. International stakeholders and local private institutions only supported implementation activities financially. Apart from them, the relevant local groups, especially farmers, participated in several training programmes, and as a result, an increasing number of people have started using sustainable technologies –drip irrigation systems, closed irrigation systems, organic agriculture, etc— in their production activities (WWF-Turkey 2004d, 1-35; Özesmi, Tırpan, Uzel 2005, 7-17, WWF-Turkey 2004b, 3-13).

As mentioned before, the IWRM planning process was realized at the catchment level, and it has not been enlarged to the entire Konya Closed Basin scale yet. Because the experts of the plan thought that it would have taken too much time to obtain concrete results at such a huge regional scale; and this situation would have caused difficulties in obtaining the supports of all stakeholders; i.e. their trust in the project might have decreased since they had not seen concrete results. Therefore, they aimed at attaining functioning

concrete results in short-term by preparing and implementing sub-basin management plan. With this aim, all planning studies at different scales –land use plans, development plans, conservation plans, management plans, etc—, infrastructure projects, monitoring and evaluation studies have been performed for the priority areas with the supports of the stakeholders for five years. As a result of these, the number of people, institutions and organizations that care about sustainable development and basin scale concepts in their planning and production activities have been increasing day by day.

Since the aim of the research is the analysis of the IWRM planning process in Konya Closed Basin in terms of the IWRM planning criteria –general principles and planning tools—mentioned in Chapter III, I evaluate the achievements of the Konya Closed Basin planning process in Table VI.9 with respect to these criteria.

Table VI.9. Evaluation of The Success of Konya Closed Basin IWRM Planning Process

IWRM Planning Criteria	Explanation of Criteria	Whether The Principles Have Been Satisfied in the Konya Closed Basin IWRM Planning Experience	Explanation of Reasons of Whether The Principles Have Been Satisfied in the Konya Closed Basin IWRM Planning Experience
General Principles of IWRM Planning			
Holistic Approach	It is the broadest management of all physical characteristics of water resources with socio-economic and political factors across a water basin region	ø	Not satisfied due to lack of necessary institutional and legal structure in Turkey
Catchment Level Approach	The catchment level is the specific and smallest complete hydrological unit of analysis and management for implementation of IWRM planning	√	The partners of the project aimed at attaining functioning concrete results in short-term by preparing and implementing sub-basin management plan
Strategic Approach	It is linked to filtering process that is focusing on key aspects of systems that help achieve system goals	~	The planning process was organized depending on a strategy; but this strategy does not include the social dimension due to insufficient technical capacity of related institutions about the IWRM planning approach
Systematic Approach	Since all water resources are part of a complex environmental and social system, an efficient systematic approach is necessary for IWRM planning	ø	Not satisfied due to lack of necessary institutional and legal structure in Turkey
Goal-oriented Approach	It is the identification of common goals and activities among stakeholders	√	The common goals and the activities among stakeholders was identified

Table VI.9. (Continued)

Adaptive Management Approach	It is a policy implementation approach that develops an optimal management capacity	~	The defined policies were tried to implemented; but an optimal management capacity could not be developed due lack of sufficient technical capacity, and institutional and legal system in Turkey
Participatory Approach	It emphasizes the need for more stakeholder involvement in water development and management	√	The planning process was realized with the participation of 600 stakeholders and involvement of several partners
Capacity Building Approach	It involves education and awareness rising of all stakeholders about water; and all related data collection activities for making assessment, problem identification, planning, implementation and evaluation about the plan area.	√	At the end of the five years, the capacity increased on the stakeholders is clearly observed as a result of the several capacity building activities
Reliable & Sustained Financing	Clear and long-term financial support from government or other partnerships is necessary for sustaining the successful implementation of IWRM planning approach	~	There are several stakeholders that make the financial support to the project; however there is no institutional system that sustains the financing needs for the implementation activities
Water as an economic good	It is very important to achieve equitable allocation and sustainable usage of water	~	One of the primary aims of the project is sustainable use of water; but the equitable allocation of water has not been considered during the process.
Social Dimension of Water Management	It requires attention to social impact assessment, work place indicators and other tools to ensure social dimension of sustainable water policy implementations	ø	Not consider due to insufficient technical capacity of related institutions about the IWRM planning approach

Table VI.9. (Continued)

Strengthen Roles of Women	Women participation in IWRM planning as decision maker positively influences project quality and sustainability because women play a key role in the collection and safeguarding of water for domestic and also agricultural usage	Ø	Not consider due to insufficient technical capacity of related institutions about the IWRM planning approach
Planning Tools of IWRM Planning			
Public Participation	Organization of the related activities in order to satisfy the involvement of all stakeholders of an IWRM plan	√	The planning process was realized with the participation of 600 stakeholders and involvement of several partners
Social Capacity Building Activities	Organization of the related activities for increasing capacity of the stakeholders about the IWRM planning process	√	Education activities and combination plans were organized in order to increase the capacity of related stakeholders
Stages of IWRM Planning Process	Iterative and circular periodization of the IWRM planning process in terms of its purposes.	~	All stages of the IWRM planning process were satisfied; but these staged were not organized in a systematic order by the coordination of a related institution

√ = Represent the principle that was satisfied properly during the IWRM process

Ø = Represent the principle that was not satisfied during the IWRM process

~ = Represent the principle that was partially satisfied during the IWRM process

Examining the table, it is clearly observed that during the Konya Closed Basin IWRM planning process, four of the general principles of IWRM planning —catchment level, goal-oriented, participatory, and capacity building approaches— were satisfied by using the related planning tools. It should be mentioned that the project, before anything else, aimed at satisfying these four principles. In other words, it managed to attain its very aims.

However, due to the inadequacy of the institutional and legal system regarding the IWRM planning approach in Turkey, four other general principles of IWRM planning were partially satisfied; and the remaining four general principles were not satisfied. In other words, because there is no institutional and legal structure in Turkey that coordinates, controls and finances the planning process at the water-basin scale, some principles were partially met, while some other were not met at all.

The partially satisfied principles were adaptive management approach and staging of IWRM planning process; recognizing water as an economic good; paying attention to the social dimension of water management; and strengthening the roles of women. Meanwhile the non-satisfied principles were strategic, holistic and systematic approaches and sustainable financing.

In conclusion, the Konya Closed Basin IWRM Planning Process can be considered **efficient, effective** and **functioning,** because four of the general principles of the IWRM planning approach were satisfied properly and four of them satisfied partially. So, the Konya Closed Basin case indicates that even in this kind of huge regional scale,

through the IWRM planning approach, a participatory planning process can be efficiently and effectively performed.

However, although the Konya Closed Basin IWRM planning process met some general principles of the IWRM planning, the considerable outcomes of this planning attempt are very little in number. There are three main reasons of this situation:

(1) Since the related legislation in Turkey does not include an institutional system like a ‘Basin Committee’, the planning process has not been holistic, systematic and financially sustained in order to coordinate, control and finance the related activities. This situation caused some failures in implementation and evaluation activities.

(2) In this huge regional scale, it takes a long time to observe the concrete impacts of the planning effort that aimed at attaining a balance between development and conservation.

(3) IWRM planning studies at the entire Konya Closed Basin scale has been just launched; therefore, it is early to make comments about the success of this process.

CHAPTER VII

CONCLUSION

Due to the unsustainable and short-term planning approaches, the last 30 years witnessed a severe decrease in both quality and quantity of water resources throughout the world. To overcome this problem, the "*water management*" approach has been discussed in the international arena since 1977. *"Water Management Planning"* is one of the key components of this approach together with other related disciplines —public administration, environmental engineering, civil engineering, etc. Water Management Planning is supposed to contribute to sustainable development, because water and land are linked by a number of complex natural and economic processes.

The numerous international conferences and workshops highlight that water resources have *no political border*, so any human activity performed at some point in the world can have global effects. This very fact marks to the *crucial role of the spatial planning*: Land-use decisions do impact on water resources directly or indirectly; especially those decisions applied in a water basin strongly affect on the water resource in the basin. Water resources should be taken care of at any planning scale; however due to the area they cover – which, most of the time, take place within the administrative boundaries of more than one region or province; and also due to the importance of these resources on a much wider scale beyond the

settlement scale, the role of regional planners particularly comes forefront.

Integrated Water Resource Management Planning (IWRM) has been recognized as the most sustainable approach to achieve a balance between physical/economic development and water conservation. Therefore, this thesis has aimed at examining the IWRM planning as an important regional planning tool, and exemplifying its implementation in one of the water basins of Turkey, namely the Konya Closed Basin.

The main questions of the study have been:

1) Why and how the water management planning approach in general and IWRM planning approach in particular came into being in the world,
2) How these approaches have been adopted and implemented in Turkey.

Relatedly, the sub-questions of the thesis have been:

1) Why the water management concept came into being in the world,
2) How and why IWRM approach has been recognized as the most appropriate approach,
3) What the general principles of IWRM are,
4) How the water resources have been managed and planned in Turkey,

5) As an IWRM practice in Turkey, how the Konya Closed Basin IWRM Planning process was realized and what the results were.

To answer all the above questions, the study has been organized in two major parts:

1) Theoretical framework
2) Case study analysis.

These major parts have been discussed within six chapters, which are to be summarized with their outcomes as follows:

While starting this thesis, as an introduction, **Chapter I** is to briefly explain the subject, aim and scope of the study.

Before discussing the IWRM approach, it was necessary to understand why water management planning came into the picture in the world; how the IWRM approach has been recognized as the most appropriate one for water management planning, and what kind of a relationship exists between IWRM and regional planning. To display the vital role of water management planning, **Chapter II** shows the statistical figures about the accessibility of drinking water and sewage infrastructure, diseases related to water, and sectoral distribution of water consumption. Moreover, it examines the international water conferences, which have been organized since 1977 in order to solve the severe water-related problems displayed by the statistics, and the highlighted the issues discussed in these conferences. The important findings of Chapter II are summarized below:

- The accessibility of drinking water and sewage infrastructure changes from one region to another. Approximately 40% of the world population is under the risk of infection from water-born diseases.
- Remarkable water losses have been observed in the sectoral uses of water resources.
- Vis-à-vis the increasing water-related problems, it was realized that the classical water management approach, which focused on problems in a partial way, fell short to solve the water problems. The need was a new water management approach that examines the problems through a holistic perspective. As a result, several international water conferences have been organized since 1977. In these conferences, water consumption, its equal distribution, and responsible authorities were discussed. Around the broader “sustainable development” approach, the conferences agreed upon the necessity of a holistic, integrated, interdisciplinary and intersectoral water management planning approach. Consisting of these characteristics, the Integrated Water Resource Management Planning has been recognized as the most appropriate planning and management approach.
- As mentioned in Chapter I, IWRM considers the “water basin” as a planning scale because it is not merely a topographic and hydrologic formation, but has also biological, economical, sociological, and political characteristics due to its bowl shape. All socio-economic activities and plan decisions performed in a water basin affect on the water resource directly. As a result, it is important to assume the IWRM approach in the planning and protection of the basins.

Although each IWRM planning attempt is unique depending on the specific natural and socio-economic characteristics of the basins, the literature defines its general principles by examining the entire IWRM planning studies performed in the world. **Chapter III** elaborates these general principles together with the planning approaches, tools and processes with respect to the relevant literature:

- IWRM planning should be *holistic*, i.e. the physical characteristics of water resources should be handled together with socio-economic and political aspects across a water basin region.
- IWRM planning should be applied at a *catchment level*, which is the specific and smallest complete hydrological unit of analysis and implementation of IWRM.
- IWRM planning should follow a *systems approach* because since all water resources are part of a complex environmental and social system, an efficient systematic approach is necessary.
- IWRM planning should be *strategic* that focuses on key aspects of systems that help achieve system goals.
- IWRM planning should be *goal-oriented*, which is the identification of common goals and activities by stakeholders.
- IWRM planning should follow an *adaptive management approach*, which develops an optimal management capacity.
- IWRM planning should follow a *participatory approach* that emphasizes the stakeholder involvement in water development and management.
- IWRM planning should follow a *capacity building approach*, which involves education and awareness raising of all stakeholders about water; and all related data collection

activities for making assessment, problem identification, planning, implementation and evaluation about the plan area.

- IWRM planning should have a *reliable and sustained financing* because clear and long-term financial support from government or other partners is necessary for successful implementation.
- IWRM planning should recognize *water as an economic good*, which should be equitably allocated and used in a sustainable manner.
- IWRM planning should pay attention to *social dimension of water management*, which requires attention to social impact assessment, work place indicators and other tools to ensure social dimension of sustainable water policy implementations.
- IWRM planning should strengthen the *roles of women*. Women participation in IWRM processes positively influences the quality and sustainability of the project, because women play a key role in the collection and safeguarding of water for domestic and also agricultural use.

IWRM planning processes should bring all related stakeholders of different levels –international, national, local— together. These stakeholders are:

1) *Project partners* (coordinators), who support and coordinate the IWRM planning process,
2) Other *participants* that involve in the process with respect to their expertise or interests

Project partners organize an institutional system with the other participants, which consist of four basic sub-groups:

- steering committee, which provides leadership to the entire process
- planning committee, which is organized for all planning studies of IWRM process
- operating committee, which is responsible for the implementation
- TAC & CAC[47], which support other committees in technical and social issues.

Organization of all these sub-groups in an institutional perspective is very crucial to achieve a goal-oriented, systematic and strategic IWRM planning process.

Furthermore, in order to bring many people together at this kind of regional scale, the *social capacity building activities* and the following stages are used as planning tools. These are iterative and circular stages due to the dynamic characteristic of the process (See Figure III.2):

1) Initiation (assessment and problem identification)
2) Planning (plan development)
3) Implementation (making a difference)
4) Evaluation and Monitoring (consider whether we make it or not)

(Davenport 2003, 13-18; Lecture notes of the course CE497 given by Atila Uras, 2006)

[47] Technical Advisory Committee & Citizen Advisory Committee

At each stage, the social capacity building activities, which consist of information and education activities, outreach programs, and communication plans, encourage all stakeholders to involve in the IWRM planning process.

In order to explain how the IWRM planning approach is implemented and how the practical examples have influenced on the theory of IWRM, **Chapter IV** examines two IWRM planning practices in the world: Murray-Darling Management Plan (Australia) and Yangtze Management Plan (China). These two cases are handled, because they are considered successful IWRM planning practices, and referred in the education activities of this kind of planning efforts in Turkey. Besides, their water and soil characteristics and planning processes resemble the Konya Closed Basin.

The cases display that IWRM planning approach implemented at the basin scale can lead to obtain concrete and successful results. Establishment of a *"Basin Committee"* is the most important step of this kind of planning process, because this committee makes the process holistic, systematic and participatory. Furthermore, the process can achieve an institutional and legal status with the establishment of the committee and definition of its responsibilities. Then, the planning studies are implemented through the coordination of this committee and its sub-committees –steering, planning, operating and advisory committees. The crucial efforts are social capacity building activities and catchment level projects.

Having reviewed the literature on the IWRM planning, the thesis puts forward the Konya Closed Basin IWRM planning attempt as an efficient and functioning example. Before analyzing it, **Chapter V**

evaluates institutional and legal perspectives related to water resources, and water resource management planning in Turkey in order to provide a background for the case of Konya Closed Basin.

In this chapter, general conditions of water resources, sectoral water consumption level and annual water demand changes have been revealed. According to the figures, water resources have been consumed too rapidly (%40.1) and if it is consumed in that ratio, Turkey will become one of the water-scarce countries until 2030, and its water resource potential will be used up entirely. Therefore, to solve water consumption problem in Turkey, 14 governmental and several non-governmental institutions were established from 1970s onward. These institutions are responsible for planning-investment or monitoring of water resources with their related laws and regulations. Turkey also participated in several international water related conferences and signed various conventions.

With regard to these laws, regulations and agreements, Turkey prepared and implemented several regional development plans that take water management planning approach into consideration. These are national development plans, regional development plans, rural development plans, water-basin master plans, and water-basin management plans (See Table V.5). Except for the water-basin management plans, these plans have been prepared since 1958 in order to attain regional social and economical development and to diminish regional inequalities. These planning efforts can be divided into three main periods, taking care of their social, economic and environmental aims:

1. **1923-1963 (The period between the foundation of Republic of Turkey and establishment of State Planning Organization):** There were not so many regional development plans that related to development of water resources. The only important event in this period was establishment of the General Directorate of State Hydraulic Works in 1953 with the aim of development and management of water resources in order to meet different water demands. Besides this aim, the General Directorate of State Hydraulic Works has also worked on flood prevention and dried wetlands for 55 years.

2. **1963-1999 (The period between the establishment of State Planning Organization and the Helsinki Summit Meeting):** After the establishment of State Planning Organization (SPO), Turkey made progress about regional planning. In the National Development Plans prepared by SPO, the issues of regional planning, rural development, and environmental development have been discussed for years. Consequently, Turkey was divided into 16 sub-planning regions; and followingly several regional and rural development plans and water-basin master projects were prepared. In these planning studies, the *Keban Project* and *South Eastern Anatolia Project* have crucial importance in terms of water resource management experiences of Turkey: In the Keban Project, the *water-basin* was used as the planning scale of a regional development plan for the first time. Meanwhile, the South Eastern Anatolia Project was a kind of '*integrated regional plan'* that organized transportation, urban and rural infrastructure systems, education, health, residential, tourism, agricultural and industrial activities of the region, while developing its water

resources. Another important issue related to this project was that in 1989, the first *'regional development administration'* in Turkey was established for the South Eastern Anatolia with the name of *'South Eastern Anatolia Regional Development Administration'* in order to organize and control planning and investment activities.

As far as the Keban Project is concerned, it could not be implemented due to the absence of a responsible regional institution. Meanwhile, despite the South Eastern Anatolia Project, the fertility of soil has decreased in the region, and some parts of the region have become arid because of over irrigation activities and chemical pesticides; even there has been an obvious economical improvement since 1989.

3. **1999 onwards (From the Helsinki Summit Meeting onwards):** The studies in the field of regional development to get harmonized with the Acquits of EU changed the development approach and scale of regional planning. Social and economic development issues have been interrelated with the sustainability of natural resources, especially wise-use of them. In 2002, the SPO and Turkish Statistical Institute grouped the settlements at three levels (NUTS) with reference to the EU requirements, taking care of social and economical criteria. Then, the SPO decided to get prepared regional plans at the NUTS2 scale. Among the planning attempts in this regard, the *Yeşilırmak Basin Development Plan* has a crucial importance in terms of regional planning and water resource management, because it is the first regional development plan called as a *'basin development plan'* and it is also the only

completed plan that was prepared according to the EU criteria. Although this is not an ideal water-basin development plan, it could pioneer to other IWRM studies in Turkey with its multi-partner approach, strategic and systematic characteristics.

Another important attempt within the harmonization process with the Acquits of EU is the establishment of *'Regional Development Agencies'* in order to organize regional development activities. The related regulation does not give them the authority to prepare, implement and evaluate a regional plan; therefore they still do not exactly know what their functions and responsibilities are.

Since nature conservation approach was not concerned seriously in any of the plans produced in these three periods, after the 1990s, social and economical inequality brought about environmental threats –especially drought and quality decrease problems of soil and water resources—. Today, these environmental problems constitute the crucial threats on social and economical activities and also on natural resource systems.

For the 1990s, Urban Improvement Plans for Nature Protection and Land-Use Plans have been prepared in order to solve this problem. However, these plans have implementation problems, because although the legislation gives all responsibilities to related governmental institutions, it does not clearly describe the distribution of roles among these institutions. Since the plans are prepared by the experts of related governmental institutions without public participation, they could not serve genuine public needs and also not protect water resources and their ecosystems properly.

In order to overcome these planning failures in Turkey, there is a need for the *IWRM planning approach* to be implemented at the *water-basin scale*. This approach is a sustainability-oriented, integrated and participatory one to attain a balance between development and nature conservation.

After 1999, Turkey became familiar with similar water resource management planning experiences to European Countries as a result of the harmonization processes with the EU. However, expected results could not attain within these experiences, because the IWRM planning approach requires legal identification of a *water-basin* together with a *water-basin committee* established for that basin. In the absence of adequate legal and institutional bases, IWRM planning approach leads to conflicts among different authorities or between authorities and other interest groups. In order to overcome these problems, water-basin committees or similar structures can be established in the water-basin areas of Turkey with the participation of related governmental and non-governmental institutions, municipalities, governorships and also regional development agencies. If established, the IWRM plans should be prepared by the coordination of these committees. These plans can serve as frames of reference for the regional development plans of NUTS2 areas.

Followingly, **Chapter VI** elaborates the Konya Closed Basin IWRM planning process in terms of its planning tools, implementations, and outcomes through the single-case study approach in order to answer "*why and how an IWRM Planning Process has been realized in the Konya Closed Basin area"* and *"to what extent this process has met the IWRM planning criteria examined in Chapter III"*.. In the case

study analysis, stakeholders, pilot projects and the Konya Closed Basin IWRM Planning activities were used as units of analyses; and a data source was developed by data collection and in-depth interviews with project coordinators.

The chapter reveals the following results:

The initial steps of Konya Closed Basin IWRM Planning Process were taken in 1997 by Gernant Magnin, a Dutch environmental expert worked in the Society for The Protection of Nature Turkey (DHKD[48]), since he observed drought problems in the Basin in the early 1990s. Between 1997 and 2003, the biological and natural characteristics of the area were explored in order to understand potentials and threats. As a result, several wetlands, endemic species and their habitats, IBA[49], IPA[50], and IHA[51] were found in the area; and it was understood that the threats were not caused by a single resource; *all activities around the basin affected the natural system of the area*. These findings led to an integrated water management planning project at the basin scale.

In 2003, WWF-Turkey, one of the coordinators of the project, started the Konya Closed Basin Planning Process as an IWRM planning attempt; and it is still going on with the participation of 600 stakeholders at different stages. The process mainly includes *capacity building activities* (education activities and communication plans) and *catchment level projects*, which were mostly realized simultaneously.

[48] Doğal Hayatı Koruma Derneği -Türkiye
[49] Important Bird Area
[50] Important Plant Area
[51] Important Habitat Area

In this process, the Konya Closed basin was divided into three sub-basins taking care of the analyses: Tuz Lake sub-basin, Beyşehir Lake sub-basin and Ereğli sub-basin. Each of these sub-basins has unique watershed and water systems; however these systems are under the threat of pollution and drought due to the unsustainable economic activities –especially agricultural activities—, drainage of untreated wastewaters, and inconvenient land-use decisions.

Having taken preventive measures against the threats on these sub-basins, four basic aims were defined. These are:

1) Capacity-building for an effective and sustainable closed basin management process
2) Increasing dialogue among stakeholders of the Konya Closed Basin and also among partners of the project
3) Development and implementation of pilot projects
4) Increasing the public awareness about the necessity of IWRM by using communication tools

To attain these aims, first of all, the coordinators of the project contacted with all institutions, organizations and people that could be stakeholders of the project. Those, who were interested in the project, kept their contact with WWF-Turkey and the capacity building process started. During these capacity building process, interviews, meetings, education activities, and workshops were organized. In these organizations, the stakeholders that had experiences and knowledge backgrounds about the basin with respect to their professions found the opportunity to share their knowledge with other participants. As a result, *a common language for definition of the problems and their solutions* was attained; and these participants

became the stakeholders of the IWRM planning process. Actually, this is not an easy process because there are various stakeholders having different interests; and these interests may come into conflicts with each other. This is the reality of the participatory approach. So, the decision makers and stakeholders should come to an agreement in order to prepare and implement a feasible plan; even if this is not a very easy process.

So far, the IWRM planning process was realized at the catchment level and the studies related to the entire basin have not been launched yet, because the experts of the plan thought that it would have taken too much time to attain concrete results in such a huge regional scale; and this would have created a mistrust among the stakeholders for the project. Therefore, they aimed at achieving functioning concrete results in short-term by preparing and implementing sub-basin management plans. Three management plans have been prepared since 2003 as catchment level projects within the IWRM planning process. However, only the Tuz Lake Management Plan was completed, and it is supposed to pioneer to the Konya Closed Basin IWRM plan with its management and planning tools. As a result, Chapter VI elaborates it as an *'effective'* and *'functional'* implementation in the basin.

The elaboration shows that in the Tuz Lake Sub-Basin, which is under serious threats of drought and pollution, an IWRM planning process was performed with the coordination of the Environmental Protection Agency for Special Areas[52] and partnership of WWF-Turkey. The process can be regarded effective and functional, because most of the general principles of IWRM planning approach

[52] Özel Çevre Koruma Kurulu Başkanlığı

were realized positively during this process (See Table VI.9). In this process, *public awareness* was raised and *local capacity was improved* through the organization of education activities and communication plans. The planning process was performed through the meetings organized in different cities and with the participation of various stakeholders.

I have periodized the stages of the Tuz Lake Management Planning process with respect to the literature review (See Figure 6.7):

- *Initiation stage* consists of analyses, education activities, meetings and workshops organized for evaluation of the existing situation and problem identification.
- *Planning stage* includes definition of plan principles –plan decisions, the management scheme, actions of sub-groups defined in the management scheme—, and preparation of the "Synthesis Plan" at the watershed scale by combining all sub-plans and projects related to this plan.
- *Implementation stage* consists of action plans, training courses and other activities for implementation of the plan decisions.
- *Monitoring and evaluation stage* includes meetings and workshops organized by the Environmental Protection Agency for Special Areas.

In this planning process, the management scheme was drawn paying close attention to the local authorities, because the meetings and plan implementations focused on the crucial roles of local institutions and organizations for sustainability of the plan. Furthermore, the Land-Use Plan was prepared as a "synthesis plan" due to inadequate

legal and institutional frameworks for the preparation of a plan at the basin scale. Evaluation and monitoring of the plan implementations were performed by the committees –steering committee, planning committee, and operating committee— under the coordination of the Environmental Protection Agency for Special Areas, and worked as an ”Open Platform” due to the lack of an institutional structure at the basin scale. In addition, since the IWRM attempts are not legally binding in Turkey, the implementation of the plan was up to the will and the capacity of the coordinating institution.

As a result, when examining the table, it is clearly observed that during the Konya Closed Basin IWRM planning process, four of the general principles of IWRM planning —catchment level, goal-oriented, participatory, and capacity building approaches— were satisfied by using the related planning tools. It should be mentioned that the project, before anything else, aimed at satisfying these four principles. In other words, it managed to attain its very aims.

However, due to the inadequacy of the institutional and legal system regarding the IWRM planning approach in Turkey, four other general principles of IWRM planning were partially satisfied; and the remaining four general principles were not satisfied. In other words, because there is no institutional and legal structure in Turkey that coordinates, controls and finances the planning process at the water-basin scale, some principles were partially met, while some other were not met at all.

The partially satisfied principles were adaptive management approach and staging of IWRM planning process; recognizing water as an economic good; paying attention to the social dimension of

water management; and strengthening the roles of women. Meanwhile the non-satisfied principles were strategic, holistic and systematic approaches and sustainable financing.

As a result, the Konya Closed Basin IWRM Planning Process can be considered **efficient, effective** and **functioning,** because four of the general principles of the IWRM planning approach were satisfied properly and four of them satisfied partially. So, the Konya Closed Basin case indicates that even in this kind of huge regional scale, through the IWRM planning approach, a participatory planning process can be efficiently and effectively performed.

However, although the Konya Closed Basin IWRM planning process met some general principles of the IWRM planning, the considerable outcomes of this planning attempt are very little in number. There are three main reasons of this situation:

(1) Since there is not an institutional system like a ‘Basin Committee’ in the related legislation in Turkey, the planning process was not holistic, systematic and financially sustained so as to coordinate, control and finance the related activities. This situation led to some failures in implementation and evaluation activities.

(2) In this huge regional scale, it takes a long time to observe the crucial impacts of the planning attempt.

(3) IWRM planning studies in at the entire Konya Closed Basin scale has been just launched; therefore, it is early to make comments on the success of the plan.

In conclusion, in the face of the increasing pressure on the carrying capacity of water resources; the traditional planning approach has become insufficient for meeting water demands and preserving water resources at the same time. Therefore, a new planning approach has been needed that does not change the balance of water resources while organizing the human activities. Only an *integrated approach at the basin scale* could be a sustainable development tool to overcome the conflicts of planning, because water and land are linked by a number of complex natural and economic processes. Noting this, most of the countries have legally identified *water-basins* together with their *water-basin committees*; and prepared IWRM plans for those water-basins under the coordination of the water-basin committees. However, the legal and institutional framework in Turkey is different; therefore, similar water resource management planning experiences, which were performed after 1999 as a result of the harmonization processes with the EU, could not attain the expected results; even if they can be regarded functioning in terms of public participation, capacity building and intersectoral coordination. The Konya Closed Basin IWRM planning process is the most efficient and functional example among these planning efforts because during this planning process, four of the general principles of the IWRM planning approach were satisfied properly and four of them satisfied partially, although the most significant outcomes are yet to come. This indicates that despite the possible implementation difficulties, if related institutional and legal frameworks are reorganized in Turkey, IWRM plans will be the most reasonable and effective approach to solve the dilemmas between development and nature conservation balance. The Konya Closed Basin IWRM planning case can pioneer the future IWRM planning studies in terms of efficient participation of

stakeholders achieved through awareness raising and capacity building activities.

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APPENDIX I

WATER RELATED NATIONAL INSTITUTIONS AND THEIR RESPONSIBILITIES

As mentioned before, there are 14 governmental and several non-governmental institutions in Turkey that are responsible for planning-investment or monitoring of water resources with their related laws and regulations.

I.1. Governmental Institutions

Ministry of Environment and Forestry[53]: It is responsible for planning, investment and monitoring of water resources. It makes scientific analyses and assessments about water resources, defines the principles and goals for protection of the environment and water resources, and solves water-pollution monitoring problems. It also defines the environmental principles and technologies for the construction of drinking water and wastewater treatment systems (Onur 2003, 38; Dıvrak 2008, 159; State Planning Organization 2007, 65).

There are three institutions bound to the Ministry which are involved in water resource management:

[53] Çevre ve Orman Bakanlığı

- State Meteorological Service[54]: It is responsible for monitoring of water resources. It collects information about climate and rain falls. It also makes forecasts about weather conditions (Dıvrak 2008, 159).
- General Directorate of State Hydraulic Works: It is responsible for planning, investment and monitoring of water resources. It makes researches and analyses about surface and underground water resources for managing and monitoring them. It also makes projects for maintaining drinking water to the municipalities those populations are over 100.000 (Onur 2003, 39; Dıvrak 2008, 159).
- Environmental Protection Agency for Special Areas[55]: It is responsible for monitoring of water resources. It prepares general principles for environmental protection and development projects. It also defines the natural protection areas (Onur 2003, 39; State Planning Organization 2007, 63).

Ministry of Health[56]: It is responsible for monitoring of water resources. It defines the principles of drinking water quality and sanitation standards. It also defines the standards of mineral water, geothermal water and swimming water (Dıvrak 2008, 159; State Planning Organization 2007, 65).

The Ministry of Public Works[57]: It is responsible for planning, investment and monitoring of water resources. It prepares development plans. It also constructs and maintains public institutions and houses (Onur 2003, 39-40).

[54] Devlet Meteoroloji Genel Müdürlüğü
[55] Özel Çevre Koruma Kurulu Başkanlığı
[56] Sağlık Bakanlığı
[57] Bayındırlık ve İskan Bakanlığı

There is also an institution bound to the Ministry that is involved in water resource management:

- The Bank of Provinces[58]: It is responsible for planning and investment of water resources. It plans the infrastructure systems of drinking water and wastewater and provides financial support for implementation of these plans (State Planning Organization 2007, 65).

The State Planning Organization: It is responsible for monitoring of water resources. It prepares the general resource plans and policies of soil and water resources. It also provides coordination among institutions in order to implement these plans and policies (State Planning Organization 2007, 66; Dıvrak 2008, 159).

The Ministry of Agriculture and Village Affairs[59]: It is responsible for monitoring of water resources. It monitors qualities of agricultural products, pesticides, and drainages and irrigation activities (State Planning Organization 2007, 63-64; Dıvrak 2008, 159).

The Ministry of Energy and National Resources[60]: It is responsible for planning, investment and monitoring of energy and natural resources. It analyzes the energy and natural resources of Turkey. Depending on these analyses, it defines the goals and policies in order to develop, produce and consume these resources (Onur 2003, 39).

There are two institutions bound to the Ministry that are involved in water resource management:

[58] İller Bankası
[59] Tarım ve Köyişleri Bakanlığı
[60] Enerji ve Tabii Kaynaklar Bakanlığı

- General Directorate of Mineral Research and Exploration[61]: It is responsible for monitoring of water resources. It makes researches about mineral and geothermal water resources. It also controls the operating of the water related facilities (The State of Planning 2007, 65; Onur 2003, 39).
- General Directorate of Electrical Power Resources Survey and Development Administration[62]: It is responsible for monitoring of water resources. It makes researches and collects information about capacity of water resources in order to obtain electric power (Dıvrak 2008, 159; Onur 2003, 39).

The Ministry of Culture and Tourism: It is responsible for planning, investment and monitoring of water resources. It plans and monitors infrastructure systems –drinking and wastewater systems— in tourism areas (Dıvrak 2008, 159).

The Ministry of Foreign Affairs[63]: It is responsible for monitoring of water resources. It makes decisions about transboundary water resources. It also monitors the implementations of international conventions (Dıvrak 2008, 159).

Secretariat General for EU Affairs[64]: It is responsible for monitoring of water resources. It works about the adaptation of EU laws. In this perspective, it monitors activities on water resources in order to keep their qualities in the EU standards. It organizes activities in order to inform people about general conditions of water resources in Turkey (Dıvrak 2008, 159).

[61] Maden Tetkik ve Arama Genel Müdürlüğü (MTA)
[62] Elektrik İşleri Etüt Dairesi Genel Müdürlüğü
[63] Dışişleri Bakanlığı
[64] Avrupa Birliği Genel Sekreterliği

Turkish Statistical Institute: It is responsible for monitoring of water resources. It prepares regular statistical data about water consumption, water demand, per capita of water resources, and general condition of water and wastewater treatment systems (Dıvrak 2008, 159).

Municipalities: They are responsible for planning, investment and monitoring of water resources. They construct, maintain and develop infrastructure systems in order to meet drinking water and sanitation needs. They also construct, operate and maintain wastewater and drinking water treatment systems. In addition, they control agricultural drainages and industrial discharges (Dıvrak 2008, 159; Onur 2003, 41).

I.2. Non-Governmental Institutions (NGO), Professional Chambers, Universities

World Wild Fund for Nature (WWF Turkey)[65]: Established in 1996 with supports of WWF, WWF Turkey is responsible for monitoring of water resources. It works as a facilitator between stakeholders and decision-makers. It makes projects and research about protection of forest, water resources, seas and their coastal areas. It also makes analyses, collects data and organizes activities in order to sustain natural resources and ecosystems (WWF-Turkey, http://www.wwf.org.tr/wwf-turkiye-hakkinda, accessed on March, 2008).

[65] Doğal Hayatı Koruma Derneği

Doğa Derneği: Established in 2002 with support of BirdLife International, Doğa Deneği is responsible for monitoring of water resources. It works on conservation of natural resources in cooperation with other NGOs, institutions and universities. It also tries to strengthen the communication between public and decision-makers (Doğa Derneği, http://www.dogadernegi.org/english/?page=3 accessed on March, 2008).

United Nations Development Program (UNDP)[66]: It is responsible for both planning and monitoring of water resources. It works on capacity building for democratic governance, action and advocacy for poverty reduction, environment and sustainable development. In order to obtain the balance between development and protection, it prepares projects and programs which emphasize roles of women, private sectors, capacity development, and information and communication technology. It also organizes activities for implementing and monitoring these projects (UNDP, http://www.undp.org.tr/Gozlem2.aspx?WebSayfaNo=47, accessed on March, 2008).

Local Non-Governmental Institutions: They are responsible for monitoring of water resources. In a defined area, they organize activities to obtain public support about protection and development of water resources. They especially aim at supporting projects about water resources. They also act as facilitators between public and decision-makers (State Planning Organization 2007, 66-67).

[66] Avrupa Birliği Kalkınma Programı

Union of Chambers of Turkish Engineers and Architects[67]: It is responsible for monitoring of water resources. In order to obtain public support about protection and development of water resources, it organizes activities that reflect the professional perspective. Among the chambers, the following ones work in this respect: Chamber of City Planners, Chamber of Environmental Engineers, Chamber of Forest Engineers, Chamber of Civil Engineers, Chamber of Survey and Cadastre Engineers, Chamber of Agriculture Engineers, Chamber of Meteorological Engineers, and Chamber of Landscape Architects (State Planning Organization 2007, 66-67).

Universities: They are responsible for monitoring and evaluation of water resources. They perform scientific research about general conditions of water resources and the ecosystems around them. They also carry out researches to encourage water resource management. Especially; departments of agricultural engineering, environmental engineering, forest engineering, meteorological engineering, civil engineering, geological engineering, city and regional planning, landscape architecture, biology and sociology realize these kinds of scientific researches (State Planning Organization 2007, 67).

[67] Türkiye Mühendis ve Mimar Odaları Birliği (TMMOB)

APPENDIX II

WATER RELATED NATIONAL LEGISLATION

There are seven laws and nine regulations about protection and/or improvement of water resources:

Environmental Law (no 2872): It was published in the Official Gazette on August 8, 1983 and its aim is the protection of environment with respect to sustainable environment and sustainable development approaches. Its principles are related to:

- Institutional cooperation
- Public participation rights
- Sustainability
- International conventions about environment
- Protection of water resources while improving them
- Environmental Protection Plan at the basin scale
- Protection of endemic species (Environment Law 1983, Cover 22, 499)

Law about Waters (no 831): It was published in the Official Gazette on May 10, 1926 and its aim is organizing the distribution and collection of water for public good. It gives all the responsibilities to municipalities and General Directorate of State Hydraulic Works (Waters Law 1926, Cover 7, 887).

Law about Underground Water (no 167): It was published in the Official Gazette on December 23, 1960 and its aim is protecting, and controlling the use of underground water resources as a public good (Underground Water Law 1960, Cover 1, 2975).

Law on Municipalities (no 5272): It was published in the Official Gazette on December 7, 2004 and its aim is the definition of work methods and responsibilities of municipalities (Chamber of City Planners, http://www.spo.org.tr/mevzuat/mevzuat_detay.php?kod=182, accessed on May, 2008).

The law defines the water-related responsibilities of municipalities as follows:

- Organization and implementation of urban infrastructure systems – water, wastewater, transportation and construction systems—, Geographic Information Systems (GIS), environment and environment health, sanitation, solid waste system, municipal police force, fire department, first aid systems – rescue teams and ambulances
- Construction of the infrastructure systems in order to collect drinking, irrigation and industrial water, and take wastewater and rain water away
- Establishment of related institutions for performing the above task

- Discussion and approval of Development Plans of the municipality and acceptance of Landuse Plan[68] of Greater Municipalities
- Definition of Urban Regeneration and Development areas, and preparation and implementation of Development Plans for preparation and implementation of Urban Improvement Plans[69] for these areas (Chamber of City Planners, http://www.spo.org.tr/mevzuat/mevzuat_detay.php?kod=182, accessed on May, 2008).

The Law organizes human activities on land and water resources through different planning types —strategic, development and environment master plans.

Law on Greater Municipalities (no 5216): It was published in the Official Gazette on July 10, 2004. Its aim is controlling plans and programmes of the services in order to make them more effective, efficient and active (Law on Greater Municipalities 2004, Cover 11, 80).

The law defines the water-related responsibilities of greater municipalities as follows:

- Protection of water basins, agricultural fields and ecology depending on sustainable development principles
- Preparation of strategic plans, annual goals, investment programs and budgets of the greater municipality with participation of related municipalities

[68] Çevre Düzeni Planı
[69] İmar Planı

- Preparation, approval and implementation of Structure Plans[70] at the scale interval of 1/5000-1/25000 within the boundaries of greater municipality
- Preparation of solid waste management plan and its implementations
- Construction of water and wastewater infrastructure systems
- Construction of GIS and Urban Information System in the greater municipality (Law on Greater Municipalities 2004, Cover 11, 80).

Agricultural Reform Law (No 3083): It was published in the Official Gazette on December 1, 1984. Its aim is organizing the agricultural activities in order to increase effectiveness of the fields. It gives responsibilities to governmental institutions for educating and supporting farmers.

Its principles are related to:

- Classifying of the agricultural areas
- Education of farmers

(Ministry of Agriculture and Village Affairs, http://www.tarim.gov.tr/, accessed on April, 2008)

Water Products Law (No 1380): It was published in the Official Gazette on April 4, 1971. Its aim is defining the rules about protection, production and controlling of water products. It gives responsibilities to General Directorate of State Hydraulic Works, Ministry of Environment and Forestry, Ministry of Agriculture and Village Affairs, and Ministry of Culture and Tourism (Suyla.com,

[70] Nazım İmar Planı

http://www.suyla.com/su-bilimleri-ve-su-urunleri/su-urunleri-kanunu.html, accessed on April, 2008).

Public Sanitation Law (No 1593): It was published in the Official Gazette on April 24, 1930. Its aim is defining the sanitation rules and giving responsibilities to the Ministry of Health for protection of public health.

Its principles are related to:

- Protection of public against epidemic diseases
- Health of mothers and children
- Water and sanitation quality of mineral waters, spring waters and drinking waters
- Responsibilities of municipalities about wastewater and drinking water infrastructure systems and sanitation (Ministry of Agriculture and Village Affairs, http://www.tarim.gov.tr/, accessed on April, 2008)

Regulation on the Protection of Waters against Pollution Caused by Nitrates from Agricultural Sources: The regulation was prepared depending on Environment and Water Products Law. It was published in the Official Gazette on February 18, 2004 by the Ministry of Environment and Forestry and the Ministry of Agriculture and Village Affairs. Its aim is analyzing, defining and preventing water pollution caused by nitrate from agricultural sources.

Its principles are related to the critical areas and wise agricultural implementations:

- Definition and categorization of the critical areas which are under the threat of pollution

- Principles of fertilizing around the water resources
- Construction of the systems that protect the surface and underground water resources from chemical pesticides
- Planting the soil around the agricultural fields in order to protect the underground water resources against nitrates
- Preparing “land-use management plans” in order to organize the agricultural activities (The Official Gazette 2004, 1-4).

Environmental Impact Assessment Regulation: The regulation was prepared depending on Environmental Law. It was published in the Official Gazette on December 16, 2004 by the Ministry of Environment and Forestry. Its aim is organizing the technical and administrative rules and principles of Environmental Impact Assessment. It covers examining the environmental impacts of a project and diminishing the negative ones. It also emphasizes public awareness raising and participation (Ministry of Environment and Forestry, http://www.cedgm.gov.tr/cedyonetmeligi.htm, accessed on March, 2008).

Water Pollution Control Regulation: The regulation was prepared depending on Environmental Law. It was published in the Official Gazette on December 31, 2004 by the Ministry of Environment and Forestry. Its aim is defining the technical and legal aspects of water pollution prevention in terms of sustainable development. It covers water quality classifications, use goals, protection principles, wastewater discharge and treatment principles, and monitoring principles (The Official Gazette 2004, 1-4).

Its principles are related to:

- Determination of the critical areas where water pollution is high
- Definition of water pollution criteria
- Using related technologies in order to diminish water pollution
- Protection of areas of water products
- Preparation of “water basin plans” under the coordination and control of the General Directorate of State Hydraulic Works
- Prohibition of underground water pollution
- Prohibition of wastewater and solid waste discharge into water resources (The Official Gazette 2004, 1-4).

Regulation on Water Intended for Human Consumption: The regulation was prepared depending on Public Sanitation Law and Law of Manufacturing, Consumption and Controlling of Foods. It was published in the Official Gazette on February 17, 2005 by the Ministry of Health. Its aim is defining the principles of sanitation quality standards of waters resources for human consumption. It only covers spring waters, drinking waters and service waters and defines the principles of maintaining, packaging, manufacturing and controlling of these waters.

Its principles are related to:

- Sanitation of drinking waters
- Informing public about drinking water pollutions and diseases
- Water quality and sanitation criteria
- Prohibition of illegal drinking water sales
- Defining the protection areas of drinking water resources and taking measures in these areas

- Defining the characteristics of the materials to be used in the construction of drinking water systems (Ministry of Health, http://www.isguvenligi.net/mevzuat/SAGLIK_BAKANLIGI/insani_tuketim_amacli_sular_hakkinda_yonetmelik.pdf, accessed on April, 2008)

Watershed Protection Regulations: The regulation was prepared depending on the Environmental Law. It was published in the Official Gazette on May 17, 2005 by the Ministry of Environment and Forestry. Its aim is defining the principles of watershed area protection and development with respect to the RAMSAR Convention. It also organizes the roles of related institutions (The Official Gazette 2005, 1-4).

Its principles are related to:

- Protection of natural conditions and ecological characteristics of watersheds
- Consideration of the functions of watersheds, when preparing all kinds of land-use and water-use plans
- Supporting all activities about wise-use of watersheds
- Definition of watershed protection areas and principles for their use
- Definition of watershed areas on the topographic maps at the scale of 1/25000
- Prohibition of wastewater and solid waste discharge into watershed areas
- Prohibition of violating the natural conditions of water resources that feed watersheds

- Prohibition of land-use development and use of chemical pesticides at the borders of watershed protection areas (The Official Gazette 2005, 1-4).

Surface Water Quality Regulation for Drinking Water: The regulation was prepared depending on the Environmental Law. It was published in the Official Gazette on November 20, 2005 by the Ministry of Environment and Forestry. Its aim is defining drinking water quality and treatment principles. It covers biological and chemical parameters of water resources that are used as drinking water. It also emphasizes the preparation of "drinking water basins protection plan" in order to use the water resources wisely and protect them from pollutions (The Ministry of Environment and Forestry, http://www.cevreorman.gov.tr/, accessed on April 6, 2008).

Regulation on the Pollution Control Caused by Dangerous Substances in the Aquatic Environment: The regulation was prepared depending on the Environmental Law. It was published in the Official Gazette on November 26, 2005 by the Ministry of Environment and Forestry. Its aim is defining, controlling and decreasing the impacts of dangerous substances in water resources. It covers analysing dangerous substances, organizing pollution-decrease programmes, monitoring pollution, and defining the discharge criteria for surface waters, regional waters and bay waters (The Ministry of Environment and Forestry, http://www.cevreorman.gov.tr/, accessed on April 6, 2008).

Urban Wastewater Treatment Regulation: The regulation was prepared depending on the Environmental Law. It was published in the Official Gazette on January 8, 2006 by the Ministry of

Environment and Forestry. Its aim is defining principles of collecting, refining and discharging of urban wastewaters and also protection of environment against the impacts of industrial wastewater discharges (Ministry of Environment and Forestry, http://www.cevreorman.gov.tr/, accessed on April, 2008).

APPENDIX III

INTERNATIONAL AGREEMENTS WHICH TURKEY HAS SIGNED

International agreements have very critical role on water management planning due to global impacts of water problems. Therefore, Turkey has participated in several international conferences and signed several agreements for years. These agreements have impacted on related legislation in Turkey (The State of Planning 2007, 51).

RAMSAR Convention: It was developed and adopted by participating nations at a meeting in Ramsar, Iran on February 2, 1971. It is an international agreement for conservation and sustainable utilization of wetlands in order to decrease wetland losses (Wikipedia, http://en.wikipedia.org/wiki/Ramsar_Convention, accessed on April, 2008).

Turkey signed this convention on March 15, 1994 and published it in the Official Gazette on May 17, 1994. According to the Convention, the signers agreed to recognize the fundamental ecological functions of wetlands and their economic, cultural, scientific and recreational value while preparing urban improvement plans. They also agreed to coordinate, control and monitor the policies and programs for protecting ecological characteristics of wetlands (Wikipedia,

http://en.wikipedia.org/wiki/Ramsar_Convention, accessed on April, 2008; Onur 2003, 35).

Bern Convention: It is a convention on the conservation of European Wildlife and Natural Habitats and it was signed by 39 states in 1979. However, Turkey signed this convention on January 9, 1984 and published it in the Official Gazette on February 20, 1984. According to the Convention, the signers agreed to recognize the ecological characteristics of flora and fauna while determining land-use and development policies (Wikipedia, http://en.wikipedia.org/wiki/Convention_on_the_Conservation_of_European_Wildlife_and_Natural_Habitats, accessed on April, 2008; Onur 2003, 35).

The convention sets out to:

- Conserve wild flora and fauna and their natural habitats;
- Promote co-operation between states;
- Monitor and control endangered and vulnerable species, including endangered and vulnerable migratory species;
- Assist with the provision of assistance concerning legal and scientific issues (Council of Europe, http://conventions.coe.int/Treaty/en/Treaties/Html/104.htm, accessed on April 10, 2008).

Convention on Biological Diversity: It is an international agreement adopted in Rio de Janeiro on June 5, 1992. However, Turkey signed this convention on November 21, 1996 and published it in the Official Gazette on December 27, 1996. The general aim of the Convention is conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising

from genetic resources. In other words, the signers agreed to develop national strategies for the conservation and sustainable use of biological diversity (Wikipedia, http://en.wikipedia.org/wiki/Convention_on_Biological_Diversity, accessed on April, 2008; Onur 2003, 35).

Some of the many issues dealt within the Convention include:

- Measures and incentives for the conservation and sustainable use of biological diversity,
- Sharing the results of research and development and the benefits arising from the commercial and other utilization of genetic resources,
- Access to and transfer of technology, including biotechnology, to the governments and/or local communities that provided traditional knowledge and/or biodiversity resources,
- Technical and scientific cooperation,
- Impact assessment,
- Education and public awareness,
- Provision of financial resources,
- National reporting on efforts to implement agreement commitments (Wikipedia, http://en.wikipedia.org/wiki/Convention_on_Biological_Diversity, accessed on April 10, 2008).

UN Framework Convention on Climate Change (UNFCCC): It was adopted in 1992 and it sets an overall framework of intergovernmental efforts for climate changes. In other words, it was a major step for tackling the problem of global warming. It recognizes that since the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide

and other greenhouse gases, all countries should consider the issue. Until now, 192 countries have participated and ratified the Convention and Turkey accepted it by publishing the law in the Official Gazette on October 21, 2003 (United Nations Framework Convention on Climate Change, http://unfccc.int/, accessed on April, 2008; State Planning Organization 2007, 51).

Governments have the following responsibilities according to the Convention:

- Gather and share information on greenhouse gas emissions, national policies and best practices
- Launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries
- Cooperate in preparing for adaptation to the impacts of climate change (United Nations Framework Convention on Climate Change, http://unfccc.int/, accessed on April, 2008)

Global Environment Facility (GEF): It was established in 1991 with the Convention of Biological Diversity and the United Nations Framework Convention on Climate Change in order to help developing countries fund projects and programs that protect the global environment. It supports projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants (Global Environment Facility, http://www.gefweb.org/, accessed on April, 2008; UNDP&GEF 2006, 1).

Turkey has been one of the members of GEF since June 7, 1994. Since that date, several projects about biodiversity, climate change

and international waters have been prepared in Turkey by the support of GEF. Moreover, GEF also supported some watershed management plans in Turkey; namely Burdur Lake Management Plan, Sultansazlığı Management Plan, and Yumurtalık Lagoon Management Plan (Global Environment Facility, http://www.gefweb.org/, accessed on April, 2008; Global Environment Facility, http://www.gefsgp.net/, accessed on April, 2008).

Global Water Partnership (GWP): It was created in 1996 by the World Bank, the United Nations Development Program (UNDP) and the Swedish International Development Agency (Sida) in order to manage water resources holistically and participate in institutional mechanisms related to water resources. It is also a working partnership among all those involved in water management: government agencies, public institutions, private companies, professional organizations, multilateral development agencies and others committed to the Dublin-Rio principles (Rana and Kelly 2004, 9; Global Water Partnership, http://www.gwpforum.org/, accessed on April, 2008).

The Global Water Partnership's objectives are to:

- Clearly establish the principles of sustainable water resources management,
- Identify gaps and stimulate partners to meet critical needs within their available human and financial resources,
- Support action at the local, national, regional or river-basin level that follows principles of sustainable water resources management,
- Help match needs to available resources

The Global Water Partnership built up a network of Regional Partnerships in Central America, Central and Eastern Europe, Central Asia and Caucasus, China, Eastern Africa, Mediterranean, Pacific, South America, South Asia, Southeast Asia, Southern Africa and West Africa. Turkey is one of the countries of the Mediterranean Region in these partnerships that bring various sectors and interest groups together to identify and discuss their common water problems and to develop action plans based on IWRM approach. For example, one of the stakeholders of the Konya Closed Basin IWRM process is Turkey Netherlands Water Partnership, a member of this regional partnership (Global Water Partnership, http://www.gwpforum.org/, accessed on April, 2008).

Water Framework Directive (WFD): After the consensus of European Commission about integrated water policies, Water Framework Directive came into force on November 22, 2000 in order to collect all water directives under the umbrella of a regulation (VAN WIJK, F.J. et al. 2003, 7).

The directive both organizes all existing directives and defines new regulations and management perspectives. The most important one is the *river-basin management* concept (VAN WIJK, F.J. et al. 2003, 7).

The goals of the Water Framework Directive are:

- Prevent the water resources and their ecosystems from all kinds of pollution
- Rehabilitate water resources
- Encourage the sustainable development for continuous protection of water resources (VAN WIJK, F.J. et al. 2003, 7).