DESIGN FOR SOCIAL INNOVATION FOR RURAL DEVELOPMENT IN
TURKEY: ACTOR RELATIONSHIPS IN THE SMART VILLAGE PROJECT

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ABSTRACT

DESIGN FOR SOCIAL INNOVATION FOR RURAL DEVELOPMENT IN TURKEY: ACTOR RELATIONSHIPS IN THE SMART VILLAGE PROJECT

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Today, the availability of the collaborative networks enables the collaboration of many actors that embraces the creation of new opportunities inside the problems that were otherwise assumed to be unsolvable over the years. The innovative way of looking at the problems to seek potential ideas is also known as social innovation. Design as a discipline takes part in social innovation practices by increasing the design capabilities of collaborative networks. In the area of social innovation, rural development becomes an important topic in Turkey. This research investigates one of the rural development projects in Turkey called the Smart Village that aims to increase the agricultural capacity of the farmers through the promotion of smart agricultural products. The thesis aims to provide suggestions for implications of design for social innovation practices in rural development through the lens of actor relations specifically for the context of Turkey. The research consists of two methods, an ethnography in the field of the Smart Village and in-depth interviews with both the villagers and the project implementation team of the Smart Village. Based on the findings, this thesis draws four conclusions. First, the project is closed to the participation of the villagers and black-boxed. To prevent this; the project should be carried out as an open-ended experiment designed in a way that fits with the grassroots practices of the villagers

where the actors can participate freely and visualize each other's conditions, expectations. Second, the scale of intervention is an important factor that initiates social innovation that is supported by local values. Instead of generating larger interventions, small scale interventions through peer learning supports the increase in villagers' adaptation to change. Third, the project should be considered as a long-term social innovation project rather than being an extent of a short-term CSR project. Therefore, the perception of promoting gadgets that solely increase the production should be transformed into the contributing capabilities of the actors. Finally, the lack of availability of the collaborative networks in the rural context shows that the project should contribute the capabilities of the actors at each level.

Keywords: Design for Social Innovation, Rural Development, Social Innovation, Smart Village, Actor-Network Theory

ÖZ

TÜRKİYE'DE KIRSAL KALKINMADA SOSYAL İNOVASYON İÇİN TASARIM: AKILLI KÖY PROJESİNDE AKTÖR İLİŞKİLERİ

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Bugün, yıllar içinde çözülemez olarak düşünülen birçok problemin içlerinde yeni fırsatlar yaratılmasını sağlarken çeşitli aktörlerin iş birliğini mümkün kılan yeni ağlar ortaya çıkmıştır. Bu ağların ortaya çıkışının sonucunda gelişen sosyal inovasyon yaklaşımı sosyal sorunların içinden yenilikçi fikirler ve potansiyeller üretmeyi amaçlar. Tasarım disiplini de farklı aktörlerin iş birliği yaptığı bu ağlarda, aktörlerin tasarım kapasitelerini arttırarak sosyal inovasyon uygulamalarının bir parçası haline gelmektedir. Türkiye'de sosyal inovasyon pratiklerinin kapsadığı önemli alanlardan biri kırsal kalkınma alanıdır. Bu araştırmada, bu kırsal kalkınma projelerinden biri olan, Türkiye'de akıllı tarım ürünlerinin tanıtımı yoluyla çiftçilerin tarımsal kapasitesini arttırmayı amaçlayan Akıllı Köy projesi incelenmektedir. Bu tez, Türkiye'deki kırsal kalkınma amacıyla geliştirilen sosyal inovasyon için tasarım uygulamalarına aktör ilişkilerini odağında barındıran öneriler sunmayı amaçlamaktadır. Araştırmanın yöntemi, Akıllı Köy projesinin uygulama alanında gerçekleştirilen bir etnografi çalışması ve alanda yaşayan köylüler ve Akıllı Köy proje ekibiyle yapılan yüz yüze görüşmelerden oluşmaktadır. Elde edilen bulgulara dayanarak bu tez dört sonuç öne sürer. Birincisi, projenin süreçleri köylülerin aktif katılımına kapalı bir kara kutuya dönüşmüştür. Bunu önlemek için; projede, aktörlerin özgürce katılabileceği ve karşılıklı koşulların, beklentilerin açık olarak

anlaşılabileceği ve süreçlerin açık uçlu müdahalelerle geliştirilebileceği alanlar yaratılması gerekmektedir. İkincisi, stratejik tasarım müdahalelerin ölçeği, yerel değerler tarafından desteklenen bir sosyal inovasyon süreci başlatmak adına önemli bir faktör olarak görülmektedir. Bu bağlamda projede yapılan stratejik tasarım müdahalelerin ölçeğinin küçültülmesi, benzer aktörlerin birbirlerinden öğrenmesini destekleyecek müdahale alanlarının yaratılması köylülerin sosyal değişime uyum sağlamasının önünü açmaktadır. Üçüncüsü, proje, bir kurumsal sosyal sorumluluk projesinin bir parçası olmaktansa, uzun vadeli bir sosyal inovasyon projesi olarak değerlendirilmelidir. Bu nedenle yalnızca üretimi arttıran araçların tanıtımına yönelik çalışmalar, aktörlerin yapabilirliklerine katkıda bulunacak çalışmalara dönüştürülmelidir. Son olarak, kırsal alandaki yenilikçi ağların eksiklikleri, projenin içinde yer alan her seviyedeki aktörün yapabilirliklerinin arttırılmasına yönelik bir yaklaşım sergilenmesi gerektiğini göstermektedir.

Anahtar Kelimeler: Sosyal İnovasyon için Tasarım, Kırsal Kalkınma, Sosyal İnovasyon, Akıllı Köy, Aktör-Ağ Teorisi

For those who are excited,

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TABLE OF CONTENTS

LIST OF TABLES

TABLES

LIST OF FIGURES

FIGURES

xviii

CHAPTER 1

INTRODUCTION

1.1. Background

In the fall of 2014, I was a Business Administration student who found out that she got accepted to the product design minor program; which was a dream of mine. Studying business was only exciting for me to understand how people's experiences, ideologies, cultures, or practices shape their purchasing decisions, which form their individual and social worlds. Studying design, on the other hand, was a deeper analysis of this journey of humanity, a more extensive translation of people's worlds into products.

My days in the product design studio were not simple. I started to spend time inside the faculty more than I expected. Everything that I planned was being delayed, and I needed the support of the other students. In one of those stays, I saw a group of people having a meeting. They were the members of the Design Club. I started to participate in their meetings when I was in the studio. In the club, some of the members were exhausted from copying the previous year's events. Those events were predominantly product design focused. Instead, they wanted to create a club that can spark new ideas for the campus. I got excited by the enthusiasm of those people willing to foster the capabilities of the design discipline, and I became a part of the club.

We created design workshops that brought a brand-new perspective to the club. After a while, the activities became known by other members of the university. One day, the Productivity Club wanted to collaborate with us to find out how might we increase the motivation for children dealing with leukemia. This collaboration was followed by the questions of "How might we create the campus a livable space for campus

animals?" with Animal Friends Club, "How might we increase the creative thinking capacity of the disadvantaged children?" with Ankara Volunteer Team and many others. The Design Club turned into a design community collaborating with other clubs to overcome the challenges that all of us faced. Later I found in the literature about the type of initiative we became, which is defined by Manzini (2015) as *collaborative organizations*. In collaborative organizations, an organization has an idea for a solution where they cooperate with others who can translate the idea into the practice. He defines a need for a supportive environment for collaborative organizations where people collectively design and produce, as the campus.

After some events, we started to search for similar initiatives to discover the new practices of design. An example of that was d.school at Stanford University, a community and space that creates tools and methods to lead people to use design to develop their creative capacity. Another was IDEO, a design company that provides open tools for building community centric solutions that produce social impact. We discovered movements, methods, and philosophies such as *open innovation, social design, design thinking*, and tried to transfer them into real-life practices. What we ascertained was illustrating what Thorpe & Gamman (2011) state; educators and practitioners are shifting towards a socially responsive design perspective that leverages communities for positive change and the development of communities' capabilities. After graduation, I continued to discover the social responsive design practices in the master's program and established a social enterprise that builds on the production capacity of disadvantaged groups through design.

In 2016, I joined a civil initiative called Designer Meetup. We were organizing meetups and workshops in collaboration with people from a broader range of disciplines in Ankara. The aim was to spark new ideas with an interdisciplinary approach. We aimed to support the creation of a space where creative communities are collaborating to solve local challenges with design practices or initiate *Design for Social Innovation* (DSI) (Manzini, 2015). For over a year, we facilitated workshops

and meetups in other cities. In August 2017, we went to İzmir to an Open Innovation Camp. The event was organized to transfer practices of social innovation into open models to make social innovation projects and practices replicable. In that event I attended a lecture called *Industry 4.0 Application in Villages*. In the speech, the general manager explained the story about the Smart Village that is established in Turkey. He initiated his lecture with the description of their project. The Smart Village is a model of a village consists of technologies that aims increase farmers control over the agricultural and animal breeding. Through the model they aim to demonstrate to the villagers in the region the potential use of smart technologies that they believe change the future of farming. The project was supported by a main sponsor and sub sponsors which provide them many resources. The main sponsors provide the Smart Village project the funding for the establishment of the campus setting, their organizational expenses including human resources. The sub sponsors provide the smart technologies, infrastructure, agricultural machinery, agricultural products for cultivation such as fertilizers, pesticides and animal breeding facility. The Smart Village also has several partners that provides them with products and services to run their settlement. He explained that through this partnerships and sponsorships in the project, it presents a unique business model that can be replicated by many villages and contributes the rural development of Turkey.

After the description of the operations in the Smart Village, he mentions the communication problems they faced with the villagers in the region. These problems particularly decreased the use of the products they offer them. Even though they target the villagers to demonstrate the new uses of the technologies and products, the villagers were not using many of them. He explained later what type of interventions they made to increase the attention of the farmers regarding the Smart Village that will contribute to the capacity of the small farmers.

While I was listening to his story of the Smart Village, I realized that the project consists of significant support when it comes to resources and involvement of the actors. According to x, the recent applications of rural development projects in Turkey shifted from the governments to civil initiatives, companies, nongovernmental organizations as well as companies. Smart Village demonstrates this shift while it also includes many actors in the organizational process including companies, public authorities even facilitating organization is a social enterprise. Also, due to the goal of the rural development of the project, the project targets the involvement of the villagers as well as those organizations. The combinations of the organizations with an aim for local transformation, the project can be evaluated through the DSI perspective.

My encounter with the design field began with the product design, yet I experienced on a small scale how design might serve for a larger complexity, embrace solutions, and initiate social innovation. However, my experience and the literature were leading me to projects that have a significant urban focus where the availability of the collaborative networks is visible. I was curious about how the practices of design can be implemented in different contexts, rural, with different actors, villagers *and experts,* which includes a higher complexity due to the lack of networks and resources. Therefore, I focused on the Smart Village project in my thesis to understand the insights of the implementation of a rural development project though the strategic design perspective of social innovation.

1.2. Aim and Scope of the Study

Social innovation – the creation of new ideas to achieve social goals (Mulgan, 2006) is initiated usually by small scale organizations. As Manzini (2015) explained, in a supportive environment, the collaboration of the small organizations can spark new practices that can be replicated and serve to a larger complexity and have long term-sustainable outcomes. He focuses on the bottom-up practices where the solution is

initiated or recognized by the local community or experts but might be supported by a larger institution to increase the capacity of the replication. Design for Social Innovation focuses on enabling the design capabilities of the initiatives with the support of a design initiative, the decision of expertise becoming a part of the co-creation of the solution (Manzini, 2015).

Considering this argument, this thesis focuses on the Smart Village project through Design for Social Innovation perspective. The thesis aims to provide suggestions for implications of design for social innovation practices in rural development through the lens of actor relations specifically for the context of Turkey. The method to reach the aim will be to understand potential learnings of an agricultural development project in Turkey through the investigation of its strategic design intervention. As explained above, with the approach of DSI towards bottom-up initiatives, this thesis also aimed to understand the grassroots practices of the rural setting to find a baseline for potential strategic design interventions. Finally, the thesis also intended to provide suggestions for design practitioners, rural development experts, and rural social innovation projects insights for the possible implementation of DSI practices in the rural context.

1.3. Research Questions

The following research questions will be answered regarding the aim of the study. The main question of the research is

- How does the Smart Village, considered as a series of strategic design interventions, shapes the relationships between different actors in the project, mainly the project team and villagers?

The sub-questions that support the responses of the main question are

- How do the developers of Smart Village imagine the perceived user, the villager and the use context, the Village?

- How do the users, villagers, interpret, adopt, and resist to the strategic design interventions of the Smart Village?

1.4. Significance of the Study

The Smart Village project's self-sustained and smart model represents a unique single model both in Turkey and in the world. Studying this model through a focus on actor relations creates unique information for the potential future projects that are willing to replicate a Smart Village model. Also, studying rural development through the perspective of DSI and actor relations brings specific insights for the DSI practices that can be carried out in Turkey especially rural areas where this type of information and case studies are rare in the literature

1.5. Structure of the Thesis

This thesis consists of the following five chapters;

Chapter 1, *Introduction*, presents a brief introduction about the related subjects of design through a personal journey and the selection of the topic. The section states the aim and scope of the study with the research questions.

Chapter 2, *Literature Review*, gathers three different topics that constitute the baseline of my methodology, field research, and conclusions. The chapter starts with the general concepts of the Actor-Network Theory and continues with the intersection points of actor network theory with design. Secondly, it illustrates the social concerns of design disciplines with the introduction of two practices; Socially Responsible Design and Design for Social Innovation. Finally, it presents approaches to rural development in Turkey.

Chapter 3, *Methodology,* presents the research approach of the study. The chapter starts with the scope of the thesis. It shows the qualitative research methods chosen in the thesis, which is an ethnography followed by in-depth interviews as a complementary method. It explains in detail the context, conduct, and field processes of each approach preferred in this study. In addition to that, this chapter illustrates how the data is analyzed. Finally, it provides the limitation of the study.

Chapter 4, *Findings*, presents the analysis of the data collected in the ethnographic research and interviews. It firstly gives a brief overview of the Project throughout a historical analysis and the outline of the strategic design interventions. The following sections review the strategic design interventions of the Smart Village. The first section gives an overview about the Smart Village project. The following three sections present those strategic design interventions that focus on facilitating technologies for crop selection, plant breeding plot, and Smart Pasture. The last three sections present the analysis of those strategic design interventions that focus on the interaction of the Smart Village with the villagers; the entrepreneurship program, trainings, and social and cultural activities.

Chapter 5, *Conclusion*, presents the conclusions of this study in line with the literature and provides outcomes of the analysis.

CHAPTER 2

LITERATURE REVIEW

In this chapter, I gathered three different topics which constitute the baseline of my field research. I focused on how strategic design interventions shape actor relationships in a Smart Village project that aims to create social innovation in rural Turkey. Therefore, this chapter aims to understand actor-networks, its intersection with design, the role of design in social innovation and finally demonstrates the history of the rural development in Turkey with a reflection on current projects for rural development.

In the first section, I describe what Actor-Network Theory is and what fundamental notions it consists of. I continue with the intersection points of the Actor-Network Theory and design discipline, especially in co-design. I move on with the emerging design fields and methodologies that are born out of the connection between Actor-Network Theory and co-design.

In the second section, I focus on define the social in the design process which is important to explain how the implementation of projects as in my research corresponds to in design discipline. After a brief overview of social aspects in design, I move on in detail with Socially Responsible Design (SRD) practice, several examples of SRD in rural development and critics related to SRD. I continue with the Design for Social Innovation (DSI) practice by defining social innovation, its intersections with design and its fundamental forms of application.

Finally, in the last section, I give an overview of rural development in Turkey. I initiate my discussions with a historical perspective on rural development approaches in Turkey. I present insights about barriers to rural development specifically for the

context of Turkey. I finish my discussions by illustrating some examples of rural development initiatives in Turkey.

3.1. Actor-Network Theory

Researches on science and technology studies are focusing on the interdependence of social and technical systems to explain the technical change (Kaghan, Bowker, Technol, 2001). As one of the explanations, technological determinism, examines the relationship between the technology and society, and implies that technology is the one of the most important aspect that changes the society. Technological determinism argues that in the development of technologies, the technology itself is considered as an "independent factor" which is considered as an outside factor that shapes and builds society (MacKenzie and Wacjman, 1999). As opposed to technological determinism, social determinism explains technical change through the explorations of social categories and interactions (Law and Callon, 1988). On the other hand, MacKenzie and Wacjman (1999) ask the question of "what shapes the technology?" to explain the relationship between technology and the social. The answer of this question can either be the society, science, economy or politics or all of them together and can be perceived as a reflection of what builds the society. They argue for a perspective to explain technical change by deconstructing the dualities of social and technical. They explain the social and technical as inseparable, in fact the social and technical are "jointly created in a single process" (Law and Callon, 1988, p. 296). Bijker and Law (1992) suggest that, in order to create a technology that better suits the social, we need to understand the process of how we organize our societies. Focusing on this process, gives the insight of what shapes the technology.

As one of the approaches in science and technology studies, Actor-Network Theory focuses on the social relations that affects the development of the technologies (Fallan, 2010). The theory is introduced by Bruno Latour, Michel Callon, and John Law in the late 1980s. The theory focuses on how the actors are affecting the creation of technologies through exploration of their relationships with each other (Law, 2004).

10

Latour (2005) explains the term actor as anything that has an action which influences others. The actor is not limited to humans, in fact the actor can be anything that shifts action. The theory explores how the actors exist in a network, their interaction with each other and how their existence and interaction shape the creation of networks. (Law, 2004).

To explain the ANT approach, Callon (1984) conducted a study on the scallops and fisherman to explain how the social relationships constituted a scientific knowledge. Scallops in France were consumed in extraordinary amounts which eventually caused the exploitation of scallops. To overcome this problem, scientists and members of the fishing community came together in Brest to found new ways of scallop cultivation. Three researches went to Japan where the scallop cultivation has a noticeable success rate. They have learned the method that could be applied and change the scallop industry. On the other hand, the direct application of the method is now possible since the actors are not directly as same as in Japan. As the theory suggests, not only the three researchers who has a knowhow on scallop development are the ones that build the scientific knowledge and development of the solution, but also, the other the fishermen, the scientific community and scallops are the actors who has a strong effect. For example, fishermen in the region are fishing without worrying about the quantity of the scallops. Without letting fisherman to understand how this type of consumption of scallops will in long term harm the scallop industry, no application of a new method can be possible. Those actors are the ones that builds the networks (Sismando, 2010).

In the creation of a network, there needs to be negotiations among the actors, where the actors need to be aligned in terms of the outcome willing to be created jointly (Fallan, 2010). The negotiation process in the Scallop example occurs when different needs of the actors can be share one objective. In this case, scallops wanted to survive, while the fisherman needs a sustainable income where the scientific community needs knowledge. Resulting from this negotiation in the Scallops example the actors were translated into new forms to share the common point. The fisherman initiated a

fishermen community to increase the awareness on scallop fishing, the scientific community increase their knowhow on the Scallop cultivation where the scallops transformed into larvae (Callon, 1984).

The example of Callon shows an Actor-Network Theory approach through the case of Scallops. As the Scallops example illustrates, the networks are living systems of relations (Latour, 1999). As Latour uses as a slogan of ANT, "following the actors" enables us to understand the collective existences of the actors and their nature in its own complexity (Latour, 2005). In the following section, I discuss four key concepts in detail, such as actor/actant, human/nonhuman, translation, and black boxing.

3.1.1. Actor/Actant and Human/Nonhuman

The Actor-Network Theory objects to the description of humans as the only creators of objects and the only shapers of the network (Latour, 2017). As I mentioned above, Latour finds the duality that the modern epistemology created between human/nonhuman problematic and he argues that it is reductionist to evaluate the nonhuman actors as the ones who have a minor value than humans to build and shape a network (Latour, 1999). He deliberately chooses the word nonhuman to replace the definition of the object, which is otherwise only defined as a human product (Latour, 1999). In the article "Technology is Society Made Durable", Latour (1990) exemplifies how a metal hotel room key holder shapes the relationship between the guest and the receptionist. He describes that, when the room keyholder is heavy, it has a superior power to lead the guest to leave their key in the reception than the simple "don't forget to leave your key" reminder of the receptionist. He also mentions that the whole network is not shaped through the metal key holder but the chain of relations of all the other actors (Latour, 1990). Resulting from this example, Latour (1993) suggests that the nonhuman actors have an equal capacity on the action and to shape the networks; they can affect our decisions and actions, as well as our interaction with an occasion.

12

As the example above suggests, every human/nonhuman, visible/invisible "thing" which has the role in defining the action in a hotel reception (the key, the receptionist, the guest and more), is described as the "actors" or the "actants" of the action (Çelikel, 2013). Unlike the traditional definition of an actor that only defines a human-individual, Latour (2017) chooses to use the world "actant" to describe everything that is the source of action (Miles, 2012). The word "actant" is not limited to the non/human objects themselves. In defining actants Harman (2009, p. 16) uses a detailed list as "pine trees, dogs, supersonic jets, living and dead kinds, strawberries, grandmothers, propositions and mathematical theorems...". Although the items on his list are seemingly unrelated with each other, his aggregation shows that the actant can be anything (neither subject nor object) that has a relationship with other things in an action (Harman, 2009) and anything that has an effect on some other actants' action (Latour, 2005).

3.1.2. Translation

Callon (1986, p. 106) also names the Actor-Network Theory as the "sociology of translation". To build a network, Callon (1986) argues that the actors should deform. This means that the actors progressively generate new forms through "negotiations, intrigues, calculations, acts of persuasion and violence" with each other (Callon & Latour, 1981, p. 279). According to Callon, the network is built through translations. By following the actors, and understanding how they construct and deconstruct their nature and society illustrates we can understand how they build a network which is called "translation" (Callon, 1984, p.198) This process of translation can be occurred by following four moments of problematization, interessement, enrolment, and mobilization. To generate a deeper understanding of the concept of translation I will explain these four moments more in detail through the example of Scallops.

Every actor has their own nature and definition of a problem. Given the example of the scallops, even though the general framing of the network initiated with the exploitation of the Scallops, each actor has their own problem; the fishermen want to

earn a sustainable income through scallops, while the scientific community seeks for advance knowledge about scallops and scallops want to live. Callon called this definition of the problem as problematization, which is the first moment of the translation.

Problematization is the initial stage of a translation process. The stage starts with the definition of the problem of each actor. In the case of Scallops, the fisherman wants a sustainable income, the scallops want to survive while the scientific community wants to increase their know-how on scallops. To build a network, after the definition of the problem, the actors seek a common point. In Scallops example all the actors' problems can be solved by understanding "how do scallops anchor?" (Callon, 201). When the problematization occurs, the actors become dependent on an "obligatory passage point", a common point that every actor share, which is the need for the study of the three researchers to increase the number of scallops by letting the scallops anchor themselves. In that way, three researchers become the controlling actor who is indispensable for network creation.

To pass through the "Obligatory Passage Point", other actors need to transform their interest toward the controlling actors (Callon, 1984, p. 201). The agreement of the actors regarding a proposal is known as interessement. At that moment, the actors redefine their identities and interests for the development of the network. An interessement can only be achieved if the identities of the actors are stabilized by the controlling actor. According to Callon, interresment is only achieved if it leads to enrolment. By enrolment, he implies the multilateral negotiations, strategies that will make more powerful interresment so that the actor is willing to act towards their role in the network. The actor might resist the enrolment process if the negotiation cannot be achieved. To enroll an actor, the controlling actor can use such strategies as "violence, seduction, transaction or consent without discussion" (Callon, 1984, p.214).

After the enrolment occurs, the controlling actor mobilizes all the actors to become allies of them. In that way, the actors will be represented by a single agent. Law (1986) explains the process of mobilization by the borrowing forces of the agents that propose inertia and becoming their representative. In the example of the Scallops, three researchers become the representatives of the fishermen scallops and scientific community. At the end of the four moments, the translation occurs. In Scallops' case, the fishermen translated into the fishermen community, the scallops are translated into larvae and the scientific community become collogues.

To conclude, translation is the exercise of power (Callon & Law, 1981). The translation represents the formation of actors and the generation of commonalities among the actors (Callon, 1984). Observing and explaining translations is critical to understanding the negotiations and interactions of the actors and networks (Miles, 2012). In other words, translations show how different actors communicate (Harman, 2009).

3.1.3. Black-Boxing

So far, the literature on Actor-Network Theory illustrated how the theory reveals the significance of actors/actants, their relations with each other and the network, their way of negotiating with each other to understand a system, a network or even an object. Building upon this approach, there is another term that comes from the social construction of technology literature, "black box." The term black box is inspired by the scientific term cyberneticians (Harman, 2009) used to define the action of closing an object or a system when it becomes too complex to analyze so that only the inputs and outputs could be simply examined (Latour, 1987). To understand this term, Latour (1987), brings us a journey and action the history of the DNA. He renders how DNA was not always a well-known fact. In fact, he displays the history during the creation of the DNA as a fact; there have been many things happen as market competitions, uncertainties, expectations of the people above the scientist in the hierarchy of the institution they belong to. (Latour, 1987, p. 4). Latour (1987) uses this example to

describe how non-scientific or non-technical things have an essential effect on the creation of DNA as a fact. His flashback on different scenes in science shows that the scientific fact -the DNA- produces a black box that is deprived of its history, relations, and other countless considerations (Latour, 1987).

By defining the black-box, actor-network theorists discuss how an agent as a perfect and close whole is purged out of its heterogeneous pieces or at least it is not visualized in its perfect shape (Moser and Law, 1999). Fallan (2010) explains black boxing as the notion where the product is the priority and the process to be taken for granted. To follow the objects in action and not take the process granted, Latour (1987) comes up with an argument on opening the black box. To do so, he suggests following the facts and artefacts before they are black-boxed or following the conflicts to revive them. From that perspective, opening a black box represents to analyzing the complexity that different actor-networks and how they are constituted (Cressman, 2009). It also gives insights on how the translations among the actors generated (Latour, 2005) a meaningful, robust system, that represent the gathering of social and technical concerns (Cressman, 2009). As Akrich (1992) suggests following designers provide insights on designers, Fallan (2010, p. 70) emphasizes the following; opening the black box reveals the process of how the product was designed before it was stabilized, conventionalized, and closed.

To summarize, Actor-Network Theory focuses on different actors/actants with different characteristics, their distribution and relation between each other while visualize the actors and understand how they come together, exchange, share and transform their attributes. Understanding this notions is crucial to analyze how actor-networks are generated (Latour, 2017). Actor-Network Theory also signals a strong relationship with design studies (Fallan, 2010) which I will explain in the following section.

16

3.2. Actor-Network Theory and Co-Design

Participatory design is a design field that involves multi actors through whole design process (Sanders, Brandt, & Binder, 2010). Unlike the traditional product design, participatory design involves users, external stakeholders and other actors who are directly and indirectly involved to co-designing the project. The term co-design in here, refers where people equally corporates with each other in their own area of expertise for the design of a fact/artefact (Sleeswijk Visser, Stappers, Van der Lugt, & Sanders, 2005). From this democratized perspective participatory design does comprise and is comprised by Actor-Network Theory.

From an Actor-Network Theory perspective, participatory design is assumed as a mediator of making democracy between actors and produce things that are public (Storni, 2015). Latour (2008) describes this medium of participation of design as the act of building things together while with a continuous risk of ignoring one actor outside the network (Storni, 2015). From one point, the risk is caused because design is used to refine and delete the bulges in the process of design the object rather than reveal it. From another point, the imbalance of participation of the actors and often causes a confusion in concepts as "humanism, human-cantered design or the materialism of the engineers" (Storni, 2015, p. 8), which in the long run turns "designer into a hero, or user as a king (Storni et al., 2015, p. 2). In the following parts, I will discuss how these concerns related with design which causes a lack of participation in design.

3.2.1. Matters of fact vs. Matters of concern

Latour (2004) argues about how scientific data relies on facts that is produced. He mentions that, the facts that science promotes are not based on as we all believe to the pure "reality". In fact, what he called as "matters of fact" promotes "a very polemical and very political renderings" of concerns of actors (Latour, 2004, p. 232). There is always one powerful data, person, actor, or anything that is above another that becomes an undeniable fact. Matters of facts are hidden behind design decisions.

17

When it comes to finish a product, the design decisions are made by over tolerating actor or fact over another to decrease the defects and reach to an impeccable version of a product (Storni, 2015). This explanation is very similar to how objects also promote matters of facts as we look back at the definition of black boxing. In every object that is designed there is a transformation of turn a concern by simplifying and leaning it into a composition that consists of purified matters of facts. Latour (2004) continues to argue that the reality is in the "matters of concern". By matters of concern he simply means that there are considerations such as ethics, culture, moral etc. which describe the actors' desire. By focusing on matters of concerns, a constructive, diverse and complex system can be structured (Ripley, Thün, & Velikov, 2009). It is suggesting the design discipline to reveal the process of design and design things; rather than closing the product and producing matters of fact (Storni, 2015).

3.2.2. Design Things

As opposed to promoting matters of facts, Binder et al. (2011, p.14) argue the following; "If objects are an effect of an array of relations, it follows that they do not exist in and of themselves; rather, they are performed and emerging." They explain that objects promote unfinished relations that are continuous and living. Resulting from this potential of an object, Binder et al. (2011) suggest designing things rather than design objects that are black boxed (Storni, 2015). What design things means is to leave the act of design open ended to embrace continuous relations, concerns and desires of actors. Though that participatory design will transform from designing using and redesigning with prototyping, it will turn into continuous prototypes. In this case the designer will turn into the facilitators of the co-design process rather than the one and only translator. The designed thing will be collectively formed, without any exact shape. In fact, it will embrace uncertainty and complexity (Storni, 2015).

There are additional views that enrich the discussions on the designing things. Binder et al. describe the process of designing things and turning the act of design into living prototypes as the transformation of participatory design into democratic design

experiments. By that, designed thing will be purified of the dominancy of designer or the user, rather it is turned into a discussion where it involves the matters of concern of the ever-changing public. Schoffelen et al. (2015) add on to this view as follows: not only designing things will embrace participation but also visualizing actors matters of concern is crucial to lead people to make sense of the complexity of the designed thing.

Even though Design Things are seemingly similar to participatory design it is different from several aspects. Participatory design focuses on democratic involvement of every stakeholder. On the other hand, it cannot be achieved since in every act of democracy there is a risk of losing one person for another (Latour, 2008). Design things go one step further than the concept of democracy. It allows the actors to involve themselves in the network as much as they want and need. This in the long run supports liberating solutions that are produced with bottom up views. Also, it increases the harmony and knowledge level among the actors since it focuses on revealing and visualizing the actors in a network. Defining the relationship between actor network theory and design in this context demolishes how participatory design lacks participation of all. As participatory design puts designer or user in a superior position, lacks sufficiency of the objects, and cause inadequate representation of actors which provides superficial and short-term solutions of participation (Storni et al., 2015). Because the idea of designing things paves the way for designing the unfinished and ongoing, designing the ones that are rooted in, it provides and sustains solutions that can be adapted in real life.

3.2.3. Summary

In this section, I started with a brief overview of Actor-Network Theory which constructs an approach of socio-technical analysis which explores the relationship among the actors during the construction of a network. Actor-Network Theory focuses on the characteristics of different actors/actants, their relation among each other and their distribution in the network without prioritizing one over another. It suggests the

importance of focusing on how the actors come together, exchange, share and transform their attributes and connections to analyze how actor-networks are generated.

I continued with the intersection of Actor-Network Theory with design discipline. Both theory and discipline are concerned with how different actors shape and shaped by the creation of the artefacts. Although participation in design promotes active and equal involvement of the actors, the perspective of actor network theory shows that it can promote the participation of actors according to their willingness and desires. Also, a design discipline with an actor network theory perspective creates an opportunity in the design field by focusing on designing things that are continuous and living and fitting into the complexity of the system by its changing structure.

3.3. Design for Social Change

In this section, I present how does the design discipline shaped by social concerns. I initially give a brief overview of the creation of the social in design. I continue with two different design practices; Socially Responsible Design (SRD) and Design for Social Innovation (DSI). In SRD, I will explain the fundamental notion of the practice, its development over the years, and its examples of rural development. I finish explaining SRD with its criticisms. I move on presenting DSI, its fundamental notions, types of organizational forms its focuses, and the suitable environments for its implementation.

3.3.1. A Brief Overview of the Creation of Social in Design

Papanek (1985) defines design as the action transforming the environment by purifying it through its problems, provide meaningful solutions through the thoughtful creation of artefacts. Resulting from the Industrial Revolution, the act of design is converted to apply the design skill to production technologies (Er & Kaya, 2008). The effects of the Industrial Revolution alter the meaning of design to be utilized and used by the masses industrially and entitled as industrial design (Papanek,1985). Even though addressing industrial design as a process of developing better standards of

living for larger folks (Er & Kaya, 2008) or a scientific way of solving the problem of masses (Simon, 1996), it also promotes products that does not consist human need but provokes human desire of buying that is not needed (Papanek, 1985). In other words, design promoted an illusion of need and is becoming a strong ally of capitalist development (Papanek, 1985).

Whiteley (1993) explains the historical development of the question of "what needs to be designed" in his book Design for Society. He explains in the early 1920s; the design was mostly driven by the market need, meaning that if the product is sold, there was no matter to alternate the product. After the late 1960s, when mass production generated mass consumption or objects as "telephone" become accessible it requires a need to differentiate the product for different consumer groups to with the aim of differentiating the producers from each other, attain a competitive advantage in the market. This change in the market directed designers' focus was mostly to transform the appeal of the product, so design started to produce consumer values that are "distasteful and exploitative" (Whiteley, 1993, p.37). This act of design profession is showing how it has an undeniable contribution to harming the societies (Papanek, 1985) and it raises the discussion whether design should canalize its power to shape the environment and society to meet with its 'real' needs or continue to produce confecting products.

Earlier than Papanek, the criticism of the design profession's current state and its potential power on changing how the consumerist system exploiting both the social and the environment put forward by Buckminster Fuller (Whiteley, 1993). Fuller believed that turning our faces into society, environment or cultures is offering us a rich overview of how to solve the world's problem with real concerns instead of putting the concerns of the businesses in front (Meller, 1972). His suggestion is showing how designers' decision is critical to change the perspectives on how to solve problems and even inspired politicians in the late '60s (Whiteley, 1993).

The views of Fuller have nurtured Papanek's criticisms on design (Papanek, 1985) and caused a call to action for designers to develop solutions regarding the people in need especially in those who are living in underdeveloped countries (Margolin&Margolin, 2012). The call of Papanek is not only shaped the execution of design activities but has a transformative effect on design as a profession that embraces social chances (Davey, Wootton, Thomas, Cooper, & Press, 2007) (Ceschin & Gaziulusoy, 2016). Meanwhile, the 'ecological design movement' and 'green design' began to emphasize how environmental contamination occurs due to consumerist action and is causing resource scarcity (Whiteley, 1993). As a result of these movements designers started to be encouraged to shift their way of working to increase the number of products that they serve into an rise in the quality of life in the products (Davey et al., 2005; Whiteley, 1993) and be considerate on their professional decisions (Whiteley, 1993). The change has occurred in not only the designer mind but also in the market. Companies started to regulate their actions due to legal and social pressure which is nowadays are being called as the Corporate Social Responsibility (CSR) caring not only about the shareholders but also the stakeholders who are affected by the product of the system. (Davey et al., 2005).

When concerns on sustainability, responsibility, and ecology are continued, simultaneously, the Scandinavian democratization movement started in the 1970s. Democratization movement is emerged as a comprehensive action to 60's cooperative design which is focusing on workers right in decisions on a development of a product or a system and named as today's participatory design and system design (Binder et al., 2011). Meaning that user also has a right to contribute to the designed system or product as much as the workers, companies, designer; since the product is designed for the user's use. (see Section 2.1.2 to read more about participatory design.). To analyze the different ways of approaching the social concerns on design, a deeper understanding of two practices is necessary; Socially Responsible Design and Design for Social Innovation. In the following section, I describe in detail how and to what

extent Socially Responsible Design is defining the social in design, transforming the act of design

3.3.2. Socially Responsible Design

So far, I mentioned Papanek's (1985) criticisms on design; designers' power is critical to shaping the environment it can be detrimental for the society by boosting consumerism, mass production and similar values of capitalism. Yet, designers' power can also be a gamechanger if it involves ethical and social responsibilities and if the act of design is applied to the areas that are needed. (Papanek,1985). He calls designers to form their interventions that will challenge the market-driven design action to a socially responsible design action (Margolin & Margolin, 2002). He gives examples of what the designers commonly design such as food or shelter is seemingly representing a need; a real need should be more concerned about what makes us alive over centuries such as access to clean water which we are taking it for granted.

His idea suggests that designers deal with a more substantial complexity by illustrating the ability of design to be more responsive to the complex needs of the world more than any other profession (Papanek, 1985). He introduced some fields that "design has neglected" in that period (Papanek, 1985) as it follows:

- Designing for the third world; making products that people in underdeveloped countries can benefit.
- Designing devices for teaching and training retarded, handicapped and, disabled people to increase their quality of life and equal opportunities.
- Designing equipment in the fields of medicine, surgery, dentistry, and hospitals.
- Designing for experimental researches to minimize the costs of research and increase research quality.
- Designing systems that will increase the quality of the lives of marginalized people.

- Designing breakthrough concepts that will no longer produce gadgets but changing the future (Papanek, 1985).

I have mentioned these fields that Papanek introduced to designers to describe the issues that Socially Responsible Design is initially concerning. It discusses problems that nowadays design profession acted such as universal or inclusive design which aim to create products that are serving for all the people without any specifications or additions for different individuals such as the elderly or disabled (Davey et al. 2002). Overtime, socially responsible design is defined as translating first worlds products that cannot be achievable by the people in need -especially in underdeveloped areas- into products and systems that are locally producible or executed in regional centers (Melles, Vere, & Misic, 2011)

Even though Papanek's identified gap is very inspirational to interrogate the designer's work, Margolin and Margolin (2002) criticize Papanek for not providing any methods for execution of Socially Responsible Design and being strongly against to market-driven design model. On the other hand, Papanek's call for action has a strong association with what we call today's Corporate Social Responsibility (CSR); where companies act responsibly to the concerns of all stakeholders that the business is in relation (Davey et al., 2002). In other words, CSR is a market-driven model with a socially responsible outcome. CSR's significant effort is to sustainably develop products and systems that will reflect as cost benefits to the company (Elkington, 1998). Melles et al. (2011) explain the core theory of CSR as the Triple Bottom Line developed by John Elkington (1998) who proposes a method to manage a dual way of generating profit with social and ecological outcomes. In the triple bottom line, the production of a product or a system will damage the environment at a minimum level with a strong concern on fitting with the company's economic expectations and resulting in a positive social impact (Diehl, Van Leeuwen, & Daalhuizen, 2007). Although the method is clear on what type of benefit it will provide in terms of adequacy of resources and public image to the business, it lacks the environmental

and social focus. Also, it is mostly profit-oriented and short term, which is far away from sustainability.

In order to turn the idea of SRD into reality, understanding the companies' varying degrees of commitment to CSR is crucial. By criticizing CSR as lacking a design-centric approach that will align the complexity that a business is operating, Davey et al. (2005) propose a model that will have a broader focus on the CSR with a Socially Responsible Design perspective. A broader version of the subjects that design can comprehend; Government, Economic Policy, Fairtrade, Ecology, Social Inclusion, Health, Education, Crime; and different sectors that SRD can be executed; Government, at a national, regional and local level, Business and commerce at global, national, regional and local level, Non-government organizations (NGOs) such as charities, pressure groups, etc. Health and education at a national, regional, and local level (Davey et al., 2005, p.5-6). Figure below illustrates the new model of SRD that is proposed.
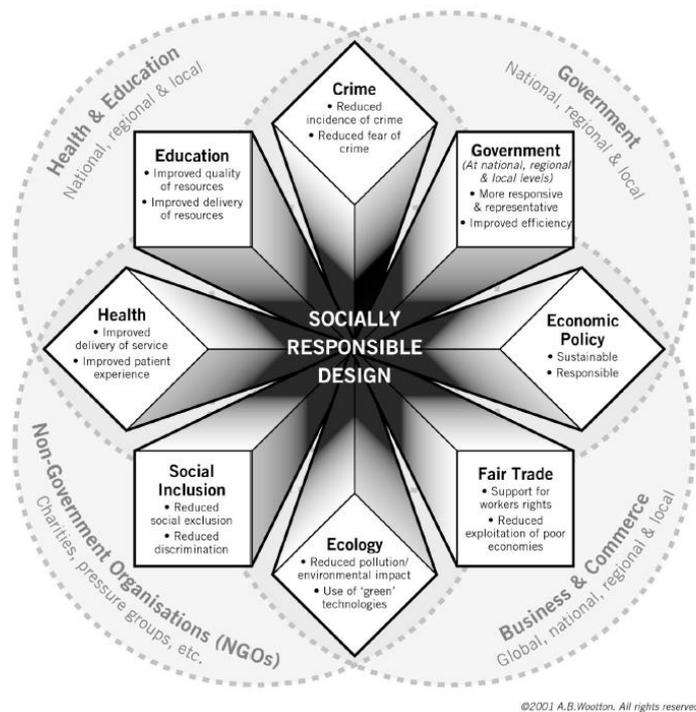
*Figure 3.1.*The eight tenets of Socially Responsible Design (Davey et al., 2005)

The reason why Davey et al. (2005) produce such a model is to bridge the potential produced in CSR from the market perspective with a more SRD focus that will consider the social transformation that will be gained not only from the business but also other stakeholders that have potential value, in different sectors. From one perspective, this approach is seemingly providing a more profound vision into how designers can be socially responsible in different contexts, from another it is again constrained to how to apply this recognition of design potential into real-life cases. On the other hand, the tenets are separated from each other which show that the model is ignoring the interrelation of the tenets with the four subject that design uncovers. For example, ecology, or fair trade only considers in the area of NGO's and Business and Commerce however these tenets are directly related to the governmental regulations. In the next section, I will give a few examples of what type of application that SRD generated around the world, especially in underdeveloped areas.

3.3.2.1. Examples on SRD Applications for Rural Development

According to the areas that Papanek which socially responsible design needed to be evolved and Davey et al. (2005)'s enlarged perspective on SRD applications that I mentioned in the above section, I have chosen three examples on products that are created with an SRD mainly focusing on rural development.

WaterWheel

Wello , a social venture, was founded by Cynthia Koening in the U.S. who developed a mission to provide water to those who cannot access clean water (Wellowater, 2016).The company is creating products for third world countries to enable access to clean water. Their product Waterwheel is designed for the women in rural India who do not have direct access to a water resource and needed to carry water with water barrels from the water resource far from the village by walking. The traditional way of carrying water is causing lots of health problems in the woman's body as well as causing insufficient water consumption. Resulting from this, many women and children have chronic medical problems in rural India (Design Indaba, 2016)

What Wello designed is a product that has a water barrel is rolling in the ground to carry up to 45 litters of water a day rather than carrying the water barrel in arms. With that product, the women are carrying more water than usual, in a shorter time in a much healthier way. To design the product, the team has travelled to India to understand the concrete experience of rural citizens with interviews of a wide range of actors (Design Indaba, 2016). Wello is funding itself initially from a price they won: Grand Challenges Canada and later made an agreement as to the CSR project of HDFC bank to deliver 12000 products for people in rural India (Tran, 2013)

Figure 3.2. Women using Waterwheel in rural India (The Guardian, 2013)

PeePoo

PeePoo (Peepoople, n.d.) is an instant toilet made of Biodegradable plastic bags for single use that can be decomposed under the ground. A Swedish professor Anders Wilhemson creates it in 2008 in Stockholm. PeePoo aims to overcome the problem of

2.5 billion people who are lacking toilets. Because of this problem spreading of germs decreases, diseases increase. The product offers a low tech and low-cost solution for economically disadvantaged people. It prevents the spread of viruses with the hygiene it provides with its design and technology.

The company has created the product for the use of people in rural and urban slums in a broader range of countries. The product is produced in Germany through funds of humanitarian organizations and shipped to countries as Kenya. The local people can become PeePoo distributor with a door to door sales strategy. They can also become carriers of used PeePoo bags to deliver them into the farms who can use the product as a fertilizer. In that way, PeePoo is not only aiming to provide sanitation and hygienic single-use toilets, but it also aims to create an income channel for the disadvantaged communities.

Figure 3.3. Illustration of how PeePoo is used (sswm.info, 2019).

LifeStraw

LifeStraw is designed as a straw that decontaminates dirty water into drinkable water that is purified 99% of the potential infection of viruses and bacteries (Vestergaard, n.d.). (Redfield, 2016)The product is founded by Vestergaard company from Denmark as a solution to provide clean and safe drinking water for rural areas in underdeveloped countries. The product is counted as an innovative product since it does not require electricity or anything extrinsic to use, and it only consists of a single part. The company is used its investments to develop, share, and disseminate the product. Over

the years, they developed more than six product categories that could be used for water purification for different purposes. However, the product is not only designed for the use of disadvantaged in underdeveloped countries, but it becomes appealing for the modern outdoor fanciers. Currently, the product is seemingly to fulfill the needs of the modern western world, while it is criticized as an expensive product for its target beneficiaries in rural areas (Redfield, 2016).

Figure 3.4. Woman using Lifestraw to drink purified water in a dirty water (Inhabitat, 2003).

3.3.2.2. Critics on Socially Responsible Design

Although Papanek proposes to intervene with the problems that he sorted through the power of good design and with an anti-consumerist approach, the way he turns his back on the market-driven design comes in for criticism. Almost 30 years after his work, the literature on market-oriented design is developed and contributed to not only the market but also to the development of organizations, societies, policies, and technologies (Morelli, 2003; Margolin & Margolin, 2002). On the other hand, the socially responsible design did not move any further than to providing technical solutions to developing countries with low cost and low-tech products (Margolin & Margolin 2002). Julier (2011) also criticizes that Papanek inspired designers' products

29

with a socially responsible perspective, are more likely to solve a local technical problem rather than focusing on the social. The tendency to understand technology as a sole problem solver is known as a technological fix and criticized as to lack of systemic realization of the problem (Hay, 2005). It provides short term solutions while it lacks a comprehensive analysis of economic and politic reasons for the problem and ignores sustainability, ethical concerns (Hay, 2005; Dobson, 2007).

One of the main criticisms of the socially responsible design is that the projects are providing "band-aid" solutions (Morelli, 2003), which means that what socially responsible designed is representatives of products and services that have a correspondence in the modern society but very infeasible to apply the solution directly. As the above examples illustrate, Waterwheel and LifeStraw do not solve permanently to the problem of access for the clean water, or PeePoo is not providing a fully functional toilet infrastructure. They might be considered as if it will fulfil the most urgent need in the area however it is just holding the real pain for a shorter period than the "band-aid" cannot resist for a long time.

Another criticism of Socially Responsible Design project is that it includes much financial dependence on other institutions (Morelli, 2003). Given the example of Waterwheel, the company needs the support of a CSR project for product development, which shows that the community might not be capable of buying their product. Alternatively, in the LifeStraw example, since the product is too expensive to be bought by the people who are really in need, it only becomes an outdoor lifestyle product. The financial dependency also evokes the dependency on the supply chain. Since the products of SRD are created mostly in the western world, it requires the production of western technology. Just like in the example of PeePoo bag, it cannot be locally produced since the technology is not based in Kenya, but Germany.

A much deeper criticism about SRD is that the product or service is not responsive to the complexity of the problem. All the three examples are produced in an omnisciently way, which means that all the products are thought and created by western gods for

the people in need (Morelli, 2003). Even though the intention is relatively positive, or the products are providing out of the box ideas, they are not empowering the community to become a part of the solution and they lack the lead to sustain it. In fact, in the long run, the SRD based solution might be a new reason to contribute to the existing problem. Finding a solution that could cover the needs for the short term could belated the comprehensive solution that has to be transforming the conditions of the rural area and enhance their living conditions.

In this section, I discuss the scope and application of the Socially Responsible Design movement. By reflecting the literature above, it is possible to say that SRD opens a window for design discipline to consider the issues that were not on the agenda on the market-is driven design model. I also mentioned how it evolves from the 1980s to today. Finally, I gave three examples of SRD projects for rural development and explained what type of counterargument that it generates. What SRD concentrates on is designers' skills and ability to intervene in social problems while it lacks the participation of the user and other stakeholders to the design process and provide a solution. In other words, it makes the designer the king of social transformation. In the following section, I describe the Design for Social Innovation practice and its way of discussing the social act of design.

3.3.3. Design for Social Innovation

In the previous section, I discuss how SRD is framed and implemented in design discipline while there are possible adversities. Hillgren, Seravalli & Anders (2011) state that design interventions -as SRD- created for disadvantaged people or minorities can only generate a short term and temporary impact for the people who face these problems. They emphasize the importance of approaching the problem with its complex framework and build a systemic solution rather than building gadgets to seemingly solve the problem (Hillgren et al., 2011). Their emphasis on how the act of design takes part in the complexity of the problem to bring sustainable solutions generates the definition of Design for Social Innovation (DSI). In this section; I

describe what social innovation is, how the design field is contributed the social innovation and what are the different forms of DSI practices.

3.3.3.1. Social Innovation

Jagou and Manzini (2008) describe social innovation as a new way of approaching to a problem to create new perspectives and generate alternative opportunities out of the problem rather than only focusing on a solution. Social innovation involves uncloaking the complexity of the system. Murray, Grice, & Mulgan (2010) argue that the traditional models of solving problems lack finding solutions to pressing social issues such as inequality, poverty, access to hygiene or migration or in their terms "intractable problems. Rather than seeking a solution to the intractable problem, they argue to find opportunities in the challenge (Murray et al., 2010). To support the baseline of the new opportunities, Murray et al. (2010) describe a new economy as a result of the availability of the collaborative networks surrounding humanity today. They refer to this new economy as a social economy, where the competition, production, and consumption leave its place to sustainability, circularity, and collaboration. Reflecting on the changes in today's economy, Mulgan (2007) describes social innovation as the creative way of producing new ideas that meet with social goals through accessible networks.

Similar to Murray et al. (2010), Manzini (2015) also defines social innovation as a new economic model. He emphasizes that in social economies, it is possible to link a local product or a service with global people and ideas. He exemplifies a farmer who can directly sell her product to an urban customer through a community-supported agriculture network. By that, he explains a world where the locals can become a part of the global as a new economic trend that is transformed into collaborative networks. Combining existing local resources with the capabilities of people in a new meaning creates social innovation and makes the communities become a part of the social economy (Manzini, 2015). In the next section, I will mention how social innovation and design intersect.

3.3.3.2. Social Innovation and Design

Manzini (2015) defines Design for Social Innovation as a new way of looking at design discipline and its change of roots into collaborative and emerging networks. DSI is described as an expert design contribution to a co-design process that aims to provide social change (Manzini, 2015, p.63). It is the way of using design capabilities into new directions that will promote social innovation (Jégou & Manzini, 2008). Manzini (2015, p. 68) argues about the changes in the economies as a turbulent environment, where today everything changes continuously over time; therefore, the solutions must adapt and be upgraded according to these changes. Unlike a project that involves a sole design mission, DSI acts as an open-ended process with multiple design initiatives from different disciplines.

According to Manzini (2015, p. 58) , in DSI projects, first design experts can use their capacity in recognition of working systems and making these systems "accessible, effective lasting, and replicable" for the transformation of others first. Second, he argues that design can take a role in social innovation with its two fields; service design and strategic design. In service design, the focus is on stakeholders' experiences whereas a service wherein strategic design; the focus is to create design activities that promote different actors' involvement. Finally, he indicates that designers can create supporting products to facilitate and proceed that relationship of actors in the networks.

Functions of DSI has a substantial similarity with participatory design (see Section 2.1.2). Manzini (2015) describes the similarity between these two design practices. Both methods are fostering a problem-solving method that focuses on the active participation of different groups and the negotiated outcome. Design is a mediator and a facilitator to harmonize the complexity in the system. Also, design is used as a social conversation tool among the actors by promoting prototypes, mock-ups, sketches, or similar tools to define and imagine the problem or desired outcome among the actors.

In other words, the design has a strong effect on triggering, sustaining, and building on the communication of the actors and networks (Manzini, 2015).

3.3.3.3. Forms of DSI Practices

Manzini (2014) describes three different forms of Design for Social Innovation, top-down, bottom-up, and the hybrid models. The three models are to answer who is designing what for whom in which context. Responses of the questions are critical for understanding the ways of approaching the complexity of a problem (Manzini, 2014). I will explain in detail what these three different models refer to in DSI practices.

Top-Down Model

The top-down DSI model indicates a design intervention forming an organization that does not directly face the problem but can solve the problem with its capacity or bridge the right actors to establish a solution such as institutions, companies or NGOs (Jégou & Manzini, 2008). The organization is using its culture, vision, and expertise in design to create potential opportunities in the problem area. The organization is also using their skills, network, and knowledge to bring different actors in harmony to collaborate in the given problem (Manzini, 2015). From these senses, top-down model is a way of implementing service design and strategic design perspectives. The services of the organization should be built in a way that the beneficiaries can execute the operations without the presence of the organization so that it can be replicable in different communities and can be a long-term solution (Manzini, 2014). Top-down models are risky in terms of the cost it requires to build, test, and sustain the idea since the community does not directly have the access the necessary resources (Mulgan, 2006). Also, there is a need for strong orientation of social cultural values even more than the design expertise in order to be accepted from society (Manzini, 2014).

Buttom-Up Model

In the bottom-up model, people who are directly exposed to the local problem produce their solutions in their communities. Those communities also are known as grassroots

organizations or grassroots movements (Manzini, 2015; Nikhah & Redzuan, 2009). The grassroots organizations represent people who collaboratively imagine developing and manage something new (Manzini, 2011, p.4) and have the capacity of organizing thought for new ideas. In bottom-up models, the grassroots organizations focus on solving their problem by bringing the existing services products or anything that they have in their hands and mind to a new user context so that it transforms their problem. Because they depend on their resources, they do not need a bigger institution to sustain their model; they become sustainable in their own local community. Meroni (2007) describes those types of communities as creative communities since they are creatively finding out new ways and ideas to change their perception of approaching the problem and provide a solution. In other words, they transform the mainstream products and services into new things that they can benefit in a new social economy (Meroni, 2007; Jégou & Manzini, 2008). A side back of bottom-up models can be that the community might not have the whole capacity to address the existing problem or the expert know-how. Therefore, the solution might lack the possibility to be spread or replicated. They could use the support of peer communities or organizations which might provide them an expert on the given context (Jégou & Manzini, 2008) which is called as "diffused and competent design" (Manzini, 2015, p. 41). The question might raise in here might be whether it is necessary to be replicated, grow, or solve the bigger problem since the people can find out how to solve their problems creatively.

Hybrid Model

When the financial capacity and expertise of the top-down model come together with the awareness of the local communities, a hybrid model is formed. This model reflects a larger complexity where the local communities seek for the support of organizations such as universities or companies to develop a larger social transformation in a compound ecosystem (Manzini, 2014). Similarly, larger organizations are heavy and slow in decision making, whereas the smaller local communities are agile to act. The model is formed depending on the desired scale of change. Murray et al. (2010) refer to this hybrid model as the "bees" (the local communities) and "trees" (larger

institutions)" model where the bees cannot achieve a bigger impact without the existence of trees. While the trees cannot move on their lives without the existence of bees, this metaphor shows the dependence of these two models. Most of the time model includes design initiatives that can be directly or indirectly involved by the communities or the larger organizations as a facilitator and mediator of the process among different actors (Manzini, 2014).

There are some commonalities in each form of DSI practices. Manzini (2015) explains DSI as where the dualities are blurred and where there is one over other, everything is meaningful in its context. First of all, unlike SRD (see Section 2.2.2) or as Hillgren et al. (2011) describes how the US context describe DSI (to provide products and services for an underdeveloped or developing countries who do not have access to solutions similar to western contexts) DSI focuses on emerging solutions for local problems (Jagou & Manzini, 2008). Rather than promoting a new technology to solve the problems, DSI recognizes the cultural and creative functions of a local community and generate new ideas out of them. Finally, DSI approaches the problems in a systemic perspective where it welcomes the multi-actor relationships and finds the solution within its complexity (Manzini, 2015).

3.3.3.4. Enabling Ecosystems

Manzini (2015) describes three common aspects of DSI projects with the light of the example cases. According to him, social innovation is initiated mostly by heroic figures who dedicated themselves to the mission. However, to make the project long-lasting, the local environment should be ready to link to a larger scale, and a favorable cultural, economic an institutional environment should be created. Second, the actors participated in the DSI project should share a common vision that will create conditions for making it happen. Finally, with a vision of changing the local, all the successful cases provide opportunities for not only the local level but also at a policy level. He describes these projects as "framework projects" where a vision of culture,

system, and policy shared by different collaborative initiatives for a larger systematic transformation (Manzini, 2015).

What he describes above shows a need for a favorable environment that the collaborative organization can develop its solutions in order to disseminate it. Manzini (2015) defines this type of an ecosystem as an enabling ecosystem which consists of different organizations with different capabilities that collaborate with an organization regarding its mission. On the other hand, an enabling ecosystem is highly depending on people's capabilities who created the ecosystem. In an environment that consists of a project that is mismatching with the personal capabilities of individuals and lacks other collaborative projects, it is not promoting a favorable environment for the project to exist. A favorable environment in an ecosystem should accept the new way of solving the problem, open to exchange ideas with different groups and individuals and should increase people's desire to experience new things, knowledge and awareness. Manzini identifies environments as such places where people can experiment to create open-ended solutions that could inspire actors from different levels. Those places are likely to be hybrid, involve actors from different levels, and continuously prototyping and testing ideas.

Apart from the discussions above, there are some challenges and limitations of DSI debated by some design professionals. Hillgren et al. (2011) discuss that even though the picture drawn by DSI practice promotes a systemic thinking ; the existing design capacity of the design discipline -from education to professional execution- is not enough to implement such complex solutions; whereas the economic and social capacity of communities, designers, or organizations will be challenged during the execution of DSI Projects, which might end up with high, unsustainable costs. The apperception leading to such a critic is that the complexity of bigger social problems might require a more substantial recognition such as the development of more significant infrastructure or social policies (Hillgren et al., 2011). Finally, according to Mulgan (2006), the designers' role must be more than a facilitator. They need to be acknowledging other disciplines' value in the design process and focusing on the real-

life implementation more than just bridging and conceptualizing process among the actors.

3.3.4. Summary

In this section, I explained how social innovation is defined and emerged. It can be described as new ways of approaching problems rather than focusing on sole solutions. Social innovation occurs in the new economies of today, which consists of solidarity, sustainability, and circularity. New economies are born, resulting from the availability of networks all around the world. I continued with the role of design in social innovation. In the journey of social change, the contribution of expert design into the co-creation of systems can be described as design for social innovation. DSI argues focusing on the grassroots practices of the communities and combines the capacities of collaborative organizations to develop long term and sustainable systems in a complex environment. I presented the forms of organizations that DSI practice investigates. Finally, I concluded by describing the conditions of a favorable atmosphere in design, which is open, tolerant, and supporting the learning process of the actors (Manzini, 2015, p.161).

3.4. The Rural Development Case of Turkey

In this section, I will give a brief overview of how rural development is shaped in Turkey over the years. To understand the rural dynamics regarding my research, an outline of how the public, private, and the civil sector is intervening the rural economic, social, and cultural dynamics is critical. I will move on with the sample social innovation projects in Turkey to illustrate several examples that are emerging within the current rural system.

3.4.1. History of Rural Development in Turkey

Ever since the settlement of the Republic of Turkey, 1923, agricultural production was one of the most important resources of Turkey (Akad, 2013). According to Akad (2013), during the 1920s, an underdeveloped industrial production created the need

for agricultural production, which was representing the majority of the taxes and industrial production. Even post Turkish War of Independence, focusing on agricultural production contributed to the economic growth of the country (Doğan, Arslan, & Berkman, 2015). Following two decades the rural development was mostly depending on agricultural politics, which is focused on supporting agricultural production and pursued providing new land for the villagers or setting up government-supported cooperatives (Akad, 2013; Doğan, Arslan, & Berkman, 2015). From one perspective this development plan seemingly supported the villagers, Oral et al. (2013) criticize this development approach as the act which created a baseline of agricultural companies and big farmlands and intermediary culture which over the years damages the small farmers.

After 1945, with the effects of the Second World War, the agricultural production in Turkey was interrupted, could not meet with the demand of ever-growing population and scarcity occurred in the land (Takım, 2012). Resulting from this, Turkey is focused on foreign debts to revive rural development. These debts fulfill the needs of agricultural equipment, machinery, and infrastructure in different geographies (Takım, 2012; Doğan, Arslan, & Berkman, 2015). After the 1950s, small farmers were no longer producing only for their region but started to open to the mainstream market. This stated the need for actors as the intermediaries or merchants for the small farmers (Oral, Sarıbal, & Şengül, 2013) Between 50's 60's small farmers were supported by free governmental lands, machinery trainings, bank credits for machinery purchases and transformation and replace of old products with news (Takım, 2012). Even though these governmental development plans were seemingly developing Rural Turkey, the industrial sector, especially in automotive and transportation, caused a drastic migration from villages to cities.

In the late 1960s, after the execution of the government incentives above, rural development was not only an issue for the government anymore but also other countries, local and national associations or even companies. Akad (2013) gives an example of a project from the Turkish Development Association in 1969, which was

focusing on facilitating the access of low-income families in rural to achieve new income generation modalities. In that period, many projects as such are designed by both national and international organizations in different regions of Turkey. Akad (2013) criticizes this project as only weighting the market capacity and commercial outcome of the small farmers' lands.

The 1980s are described by Oral (2013) as the times when agricultural production become market-driven rather than government-driven, which means that the government operated with neoliberal politics where several funding institutions were shaping the destiny of Rural Turkey. The period consisting of heavy internal disturbance such as strike strengthen the free market rather than the small farmer. This period also provides a basis for technical interventions to agricultural production to increase the crop range. Following these interventions, governmental policies have formed into 5-year development plans, which grew the agricultural production however could not meet with any of the goals envisioned to be achieved as they planned (Yavuz, 2005).

3.4.2. Barriers for Rural Development in Turkey

Until the 2000's the agricultural lands become lands of industrialization; eventually lost its potential and have been started to be used for different sectoral purposes. Today, Turkey is importing in many agricultural products which are caused by the emptiness of the lands as well as leading many farmers to leave their lands (Bayar, 2018). From the 2002's until today, several problems are recognized to be fulfilled in rural areas that might become an obstacle in rural development. Yalçınkaya, Yalçınkaya, & Çılbant (2006) give the following reasons:

- Lack of know-how and specialization in rural areas for agricultural production and animal breeding.
- High costs on fixed expenses as fertilizers, pesticides, machinery, diesel oil, which lowers the profit of the farmers.

- Ever-changing governmental politics are causing a perpetual closing and opening competent organizations that are providing guidance and know-how to farmers.
- Relying too much on governmental supports becomes no longer support for expenses but the only income that the farmer is generated.
- Lack of know-how on what to produce and what to sell due to lack of production planning.
- Lack of workers in the agricultural plants due to migration and disreputation of farming.

Adding on these, Oral (2013) argues a neoliberal political settlement took part in Turkey with the lead of IMF and World Bank that is shaping the rural politics according to the demands of the market. This damaged small farmers from one side while strengthening the big agricultural companies. Oral (2013) also emphasizes how multinational companies monopolize food and agricultural systems all around the world, which is reflecting in Turkey. Companies as such are holding every input of agricultural products such as seeds, pesticides, or fertilizers that one is causing the need for another. Resulting from these, it created a chain need and consumption and harming the small farmers' durableness and resilience. He identifies this new way of creating interdependent needs as new-age colonialism, which is ending up in seizing the agricultural land by causing extreme indebtment. Özuğurlu (2013) explains this problem of the small farmers by as they are stuck into the system that is created by larger institutions and lost their independence in their own.

3.4.3. Rural Development Initiatives in Turkey

So far, I illustrated a brief overview of rural development approaches in Turkey. Until the 1970's agricultural development is heavily supported by governmental policies, later it was intervened by different institutions. On the other hand, several barriers mentioned above caused a small villager stuck within an indebtment system with a lack of guidance and support which damages the rural areas. Several projects in rural

Turkey aimed to overcome the barriers directly and indirectly while eager to build a sustainable system in their context.

In recent research of Kaygan and Gürdere Akdur (2019), the authors presented projects from Turkey with a social goal that includes collaboration or participation of several actors, involvements of expert designers with a reliable outcome. Except for one project -Imroz Design Workshops- all the projects they presented has their outputs in urban settings. Considering a similar set of criteria with Kaygan and Gürdere Akdur (2019), I investigated the rural development initiatives involve multiple actors, which are shaped with a design decision and developed an outcome. I will evaluate a few selected examples below.

Ta-Tu-Ta

Ta-Tu-Ta (Tarım-Turizm-Takas; Agriculture/Tourism/Trade) is a project and a platform founded by Buğday Association to Support Ecological Life in 2004 willing to increase agricultural tourism, voluntary knowledge, and experience exchange in ecological farms (Buğday, n.d.). The goal of the project is to increase the financial resources, voluntary workforce, and knowledge capacity of small ecological farmers to lead them to sustain ecological agriculture. In Ta-Tu-Ta, individuals can become a volunteer or a visitor in an ecological farm. As a volunteer, the person can become the volunteer worker of the farmer's family in that period, which in return she gets shelter and food in the land. In that way, the farmer families can get the workforce that they mostly lack, whereas the volunteer had the chance to exchange knowledge and experience with the families. As a guest, the person can experience small ecological farm life while contributing the farmer families financial gain for the stay period.

Figure 3.5. A young tourist volunteering for drying eggplants. (Gazete Kadıköy, 2019)

The project is open both national and international guests and volunteers willing to visit an ecological farm in Turkey. Ta-Tu-Ta is not only created financial sustainability among its host farmers but also created a platform for cultural exchange among guests, volunteers, and farmers. It also contributes to producer-consumer relationships and fosters responsible behavior for ecological farming. Also, even though the project is initially funded by larger organizations to build its infrastructure, it is self-sustaining ever since then. Currently, it reached up to 95 farms and fostered agricultural tourism as a form of rural development.

Selvi & Demirer (2012) conducted a study on how the farmers got affected after the Ta-Tu-Ta project. Their findings show that the project does not create a distinctive difference in their income, does not promote numbers of guests and volunteers that might support their agricultural production, it helps only for reaching the workforce in several periods. On the other hand, villagers are positive to be a part of this project to increase their visibility (Selvi & Demirer, 2012).

Narköy

Narköy is a three functioned company designed as a hotel, education center, and farm in Kerpe, Kocaeli, Turkey founded by the Kuşçu family. It is designed to represent a %80 circular farm model that is self-sustaining (Itez, 2014). In other words, from energy used to the food eaten, Narköy produces everything inside their area. The infrastructure of hotel buildings, education area, is designed by Emir Draşhan after six years of use of organic farming plants (Itez, 2014). Draşhan explains his designs as it is performed in a way that considers the complexity of circularity; given an example is that the infrastructure is designed to transform rainwater is used in the water irrigation system, or the buildings are placed with a minimum pressure on earth so that the living mechanisms can still nurture the soil. The exterior is designed with biomimicry principles inspired by the trees and forest around the neighborhood. The designer's focus was to let the building become a part of the environment and the village.

Figure 3.6. The exterior of the Narköy hotel area. (Narköy, 2019)

The founder, Nurdane Kuşçu, is saving organic and local seed ever since her childhood. Kuşçu has more than 1200 seeds that could no longer be founded in the seed market already replaced with hybrid and genetically modified seeds. She uses these seeds in the farmland so that they can grow and live for a long time. She also exchanges seeds with local villagers so that they can benefit from it. From the tourism potential, Narköy revives the local Kerpe community living, increases their prosperity as well as provides more than 15 people from local community employment opportunities within their land. In this way, the local community learned how to do organic farming with local seeds where the personal increase their knowhow to initiate their own business (Yamaç, Zengin, 2017).

Figure 3.7. Nurdane Kuşçu in front of their seed bank in Narköy (Dünya, 2015).

OZU Gökçeada Imroz Design Workshops

Gökçeada Imroz Design Workshops are supported by Özyeğin University to create innovative and sustainable solutions to local problems faced in Gökçeada by using social design methodologies meaning that co-design activities with all the stakeholders in the public to make a collective transformation that has social value (Markussen, 2017). Unlike the above-mentioned commercial activities, these design

workshops are solely focusing on the participation of the local community, local authorities, design students, and other stakeholders that is present in Gökçeada to create innovative ideas.

Figure 3.8. Students discussing several ideas in Gökçeada Imroz Design Workshops (Hürses, 2015)

Gökçeada is chosen as a village as a diverse ethnicity and social structure. Also, the village is determined by the government for the ecological production and livestock, which eventually will contribute the tourism. However, the island was lacking fundamental know-how and capacity to achieve this goal that is appointed by the government (Erözçelik & Taşdizen, 2017). During the process, the facilitator organization Özyeğin University took a position to incorporate local functions, ideas around the community and the villagers to increase the interaction level among the actors and lead them to establish co-created design solutions, with designing directly in the village during different periods in three years.

After observation of each of the three years of workshop series, Erözçelik&Taşdizen (2017) commented that such a model could be established by not only focusing on the practical solutions that design is producing but understanding the interactions among the stakeholders and visualizing the value that is created among these interactions. This model could not be built within one week; however, after three years, the concept makes familiarity among stakeholders. It inspired the villagers and local authorities about how design and community relationships spark innovation however the project still cannot be triggered by the local community since it highly depends on the determination and willingness of the stakeholders to promote continuous social innovation. Yet it still depends highly on initiating organization (Erözçelik & Taşdizen, 2017).

Sinek Sekiz

Sinek Sekiz is a publishing house in Ortaca, Dalyan, founded in 2010 to publish books on environmental literature (Sineksekiz, n.d.) Even though the publishing house is not directly found in a rural area, it migrated to the rural area after publishing two books to accomplish their philosophy; sustaining their life in nature. The publishing house is producing their books from recycled material with ecological concerns. Sinek Sekiz is marketing the products of the local community and supporting them to sustain their culture and products within their local. They also give place to the local community in the books and present their stories to an urban community.

Figure 3.9. Local besom on the left, thyme basket on the right. (Sinek Sekiz, 2019)

Anadolu Meraları

Anadolu Meraları is an initiative that provides consulting, training and facilitates projects for family businesses, individuals and farmers to sustain regenerative farming methods in agriculture lands. After one year of its establishment, the application field of Anadolu Meraları became the first hub of International Savory Institute, which focuses on the gathering on many pastures around the words to foster a larger scale regeneration to address environmental issues (Anadolu Meraları, n.d.)

The organization has an ecological perspective that aims to repair the effects of the practices that disturbs the nature of agriculture. To do that, it focuses on the capacity development of individuals and institutions to create a long-term impact for sustainable and ecological farming.

Figure 3.10. Anadolu Meraları team inside their application field in Biga, Çanakkale. (Aslan, 2014)

Güneşköy

Güneşköy is a non-profit cooperative, that aims to develop and share sustainable living experiences that with the natural setting of the rural areas. Güneşköy disseminates ecological farming by using local seeds and focus on the sharing of local seeds. The

cooperative uses renewable energy systems to make farming more sustainable. It has the mission to repair the balance of nature through its operations. They not only perform the studies in their area, but it also has the mission to spread sustainable life in rural areas (Güneşköy, n.d.).

Figure 3.11. Güneşköy team and guests inside their land. (Tezel, 2015)

3.4.4. Summary

In this section, I presented a brief overview of the rural development in Turkey. Until a significant period, rural development in Turkey carried out through the government. Afterward, national and international organizations are started to initiate agricultural development activities. I continued with the barriers towards rural development in Turkey mainly consists of economic, social, technical challenges. I finally provided examples of rural development projects with multiple actors that are shaped with a design decision and developed an outcome. Many of the projects have an ecological

concern with an output of the social transformation. All of the projects demonstrated are established with a goal to transform the local. Projects OZU Imroz Design Workshops and Narköy have a focus to foster rural development in a particular region while the other projects who have sustained over the years as Anadolu Meraları, Sinek Sekiz and Güneş Köy propose an economic model inside the project for self-sustaining as well as to conduct operations that value systematic change. Being locally oriented with an ecological concern creates the patterns of the rural development initiates exemplified in this study.

3.5. Summary

In this review, I bring three different subjects together that create the baseline of my study and supported the methodology and analysis carried out in this research. I initiated my review with a socio-technical study, Actor-Network Theory that explains technological change through the path of actors. This means that anything that has a power of action shapes the network. An actor can be anything including human/nonhuman, fact/artifact. The theory shows that a network is not different from a living creature. It is constantly evolving, disrupting and, therefore, needs maintenance. To build a successful network, actors, translation, interessement should be carefully evaluated. On the other hand, based on the review of the literature, when a network becomes too complex to analyze, the general tendency of the stronger actor is to close it or black boxing. In a black boxed network, the other actors can only involve in the network by its inputs or the outputs. This approach is creating a nondurable network. Understanding the fundamental insights of this literature gives a methodological lead to this thesis where the main focus of the thesis formed to understand initially the actor and their relations. Since the structure of the Smart Village proposes an operation consists of multiple actors, understanding the actors, their relationship with each other and how they translate inside the network through strategic design interventions is observed during the methodology phase.

I continue the review with the intersection of Actor-Network Theory with Co-design. As the theory reveals the network as a living system, the intersection of these theories and methods is to understand the process of design also as emerging and living. Unlike the democratic approach carried out in the participatory design, an Actor-Network Theory focused participatory design involves actors to the design process in their nature, according to their willingness and desires. They both avoid designing the black box. The design action became open-ended to embrace continuous relations, concerns, and desires of actors, transformed into designing objects to designing things. The intersection of this theory and method created insights about the potential applications of the theory as well as the recent discussions of design.

In the second part of this chapter, I reviewed the social in design. I initiated my review with the overview of the awareness of designers to shift their skills and capacity from a market-driven and consumerist approach to an impact-oriented and community-driven model. I continued with two different practices of social responsive design; Socially Responsible Design (SRD) and Design for Social Innovation (DSI) According to the review, SRD carries out practices that serve the underdeveloped areas which lack the solutions that the modern western society has. Although the products are focused on solving a particular problem, SRD applications are criticized to create short term solutions that eventually belated a systemic solution for the problem faced in the region. Since the SRD practices are not favoring market-led design models, the applications are most of the time carried out under corporate social responsibility (CSR) projects. This contains dependency to other CSR project owner organization as well as blur the mission of the designer and the organizations. As I elaborate on a project that is funded under a CSR model with a goal of social transformation in the rural, review of the literature benefits the analysis of the organizational dependency on the outcomes of the dependency.

In the second part of the review of the social, I explain the DSI practices. Unlike SRD, DSI practices are carried out with a long-term impact focus in a complex environment. The practice is grounded by the new economies of today that ease the collaboration of

the actors and creations of the networks. DSI practices value a design supported collaboration among the organizations to develop a powerful network in the local that can be scaled to a systemic transformation. It gives importance to the forms of collaborative organizations that fit with the grassroots practices of the locals to sustain the collaboration for the longer term. DSI also gives importance to the favorability of the environment where individuals and organizations should accept the new way of solving the problem, be open to exchange ideas with different groups and individuals and should increase people's desirability to experience new things, knowledge and awareness. A review of the literature provided insights on how social innovation can be reached through the design support as well as to understand the right types of organizations and favorable environment for the application of projects similar to Smart Village.

In the final part, I reviewed the rural development history and practices in Turkey. This review shows that until the 1980s rural development in Turkey is driven by the governmental institutions while today it is initiated by many others. Understanding the history of rural development in Turkey gives insights about the creation of barriers that are mostly social, economic and political. Also, a review of the recent project applications shows that the initiatives of rural development concerned with a focus on local transformation for a systemic change. The projects that have an economic output are more likely to sustain over the years compared to the dependent projects. The review of this literature supported my analysis and methodology by understanding the outside factors, tactics, and strategies for rural development.

To conclude, I gather three different topics that supported the methodology and analysis of this thesis through the actor level by Actor-Network Theory, through the organizational level by uncovering the social in design and social, economic and political level by understanding the rural development history and practices of Turkey. In the next chapter, I present the methodology of this thesis.

CHAPTER 3

METHODOLOGY

In this study, I present a Smart Village project that established a smart farming facility in a village in rural Turkey. I selected the project since it consists of collaborating organizations, uses strategic design interventions as a tool for social innovation with a long-lasting goal to contribute to rural development in Turkey. In this research, I examine how Smart Village project's strategic design interventions shape the relationship of the actors, which might provide insights for DSI implementations in the rural context.

In this chapter, I explain the research methodology of this thesis. I conducted qualitative research methods consisting of two phases. The first phase was a preliminary visit and the second phase was an ethnography with complementary interviews. In this chapter, I describe how I conducted ethnographic research and interviews. I also present the data analysis methods I used after I finished my research. I end this chapter with the limitations of the data collection process.

5.1. Scope of the Study

Smart Village is a project, a smart farming facility established in the Aegean region of Turkey. The project aimed to contribute to rural development by increasing the agricultural capacity of the farmers. It adopts smart industrial technologies for the use of small farmers to improve farmers control over the farming process. It aims to inspire and encourage the villagers to use the systems that it demonstrated in the area. It applies the same practices for animal breeding and contributes to the growth of husbandry of the Village in which the project is settled. The primary goal of the project is to create a working model that could inspire other villagers to replicate.

I selected this project as the scope of this thesis for several reasons. First, the project is designed in a way that requires the collaboration of many actors such as the Smart Village team, villagers, municipalities, universities, private sector, governments. It builds a new form of relationship among these actors to facilitate social innovation with a long-term goal. Second, even though there is no expert designer or design initiative inside the collaborating organizations, there are many design decisions given during the process which can be called as strategic design interventions. Those interventions build and shape the co-creation of the Smart Village model and its interaction with other actors. Understanding the interventions give insights into the applications of DSI practices for rural context. Third reason why I selected this project as a scope of this research is since it is settled in a particular region, operating for more than three years and executing the project plans every day. These features provided me as a researcher an opportunity to analyze the past and current situation for an extended period. Finally, the project has a significance in Turkey as being the first initiative which develops the idea of a Smart Village.

5.2. Research Approach

In this research, I examine the how the actor relationships in a Smart Village Project are shaped by the strategic design interventions of the Smart Village. To discover the relationship among different actors, I need to understand the context of each actor as well as their needs, desires, motivations, responsibilities. As a result of this, in this research, I adopted qualitative research techniques. According to Flick (2009), qualitative research proposes a way of exploring social relationships and demonstrates a broader range of perspectives of different stakeholders about a given context. Snape and Spencer (2003) state that qualitative research brings a more profound understanding of the words of individuals by focusing on their experiences, stories, and perspectives, which, in total enables the researcher to define the participants' social world. Having a more comprehensive perspective on individuals' social worlds supported my analysis of how they construct their relationship with each other and the reflections of these relations on the process of social innovation.

According to Ritchie (2003), qualitative research has four types of functions. It can be either contextual to describe the nature of what exists, explanatory to understand the reasons and associations between what exists, evaluative to uncover the effectiveness of an existing phenomenon and generative to support the development of theories. In contextual research, it is essential to understand what exists in the nature of a social world. In my research, I carried a contextual approach by focusing on unpacking the nature of the stakeholders' context (i.e. the Village) and their interaction with the other actors (i.e. Smart Village). I also carried an explanatory approach to understand the factors that effects attitude change of an actor toward another as well as to understand the motivation behind the action of each actor that reflects the relationship between each other. Finally, I carried an evaluative approach to explore the contexts in which the actors receive interventions of the Smart Village.

Following those, Williamson (2006) explains the creation of knowledge through constructivism, which is an interpretive philosophy in qualitative research techniques. According to Williamson, constructivism investigates how people construct their words by exploring cultural values, motives, or perceptions. It also investigates how people collaboratively create meaning. In other words, it investigates how the social world is constructed collectively by people (Williamson, 2006). Adding on that, Flick (2009) explains different forms of knowledge among people from different groups as social representations. With a focus on social representations, researchers can understand how knowledge is developed among different groups with different social constructions (Flick, 2009). As a result of those arguments, I carried out a constructivist approach by collecting the experiences, intentions, and conditions of the actors. I also focus on the social representations of different groups to explore how their socially constructed frameworks affect their interaction with each other.

5.3. Data Collection

As I mentioned above, the main focus of this research is to explore the actors in their natural settings and how the strategic design interventions of the Smart Village shape

the relationship of actors with each other. To capture that, I followed three different phases in data collection: preliminary visit, ethnography and observation. I initially made a preliminary visit to the Village to understand the Smart Village project, its aim and goal, and its current operations in the Village. I made interviews with two officers and made a field trip to investigate the Smart Village plot. Six months after my visit to the Smart Village, I conducted an ethnography for eighteen days to observe the everyday practices in order to understand agricultural production, culture, and the relationships among the actors. During my ethnography, I determined the actors that I can interview to collect a more profound knowledge about their experiences, conditions, and expectations regarding their relationship with the Smart Village. The Table 3.1 illustrates the data collection phases according to the data collection period and place.

Table 5.1. *Data collection phases according to period and place*

	Data Collection Phase 1	*Data collection Phase 2(a-b)*	
Stage	Preliminary Visit	Ethnography	Interviews
Period	27 November 2017	6-24 June 2018	
Place	Smart Village	Smart Village and the Village	

During these phases, I also evaluated the documents developed by the Smart Village both for external representations and internal reporting. These documents were helpful to understand the framework of the Smart Village project and its history. Furthermore, I took photos of the plots, facilitating technologies used in the plots as well as the smart technologies infrastructures, which supported my analysis and transcription of my field notes.

5.3.1. Data Collection First Phase: Preliminary Visit

Ritchie (2003) argues that a preliminary study is useful when there is a complicated case to analyze, and it is essential to understand the main creation of the subject matter.

It gives the essential idea to the researcher to identify variables and associations about the subject (Ritchie, 2003). After I decided to study rural development and selected Smart Village Project to investigate, I needed additional knowledge about its application in the Village. Since I had spent all my life in the urban area, I did not have exclusive experience and know-how about agricultural production. Therefore, to have the first insight about the agricultural production, Smart Village's aim and goal in the area, and their already existing operations, I conducted a preliminary visit to their plot in November 2017. This visit was critical for me to understand the case. Before I went to the plot, through my research on the internet and my first introduction to the founder in İzmir, I was expecting to see the products that they develop for the villagers, how the villagers were using the products and the perception of the developers about the user context and the user during the development of the products. However, after my first visit, I encountered that I had a misperception about the case. In fact, they neither develop technologies for the villagers, nor villagers use them. Rather, I understood in this visit that they built a smart village model that inspire villagers to use smart agricultural products and presented facilitating technologies that can increase their production value. I also understood that they had strategic design interventions to achieve their goals, which aimed to involve villagers not only through technology but also through social and cultural interventions.

In this visit, I interviewed two officers of the Smart Village (See Table 3.2.) I initially talked with the technology officer. After our interview, we made a field trip to the Smart Village plot. During this visit, I took pictures and field notes, which lead me to design my ethnography and interviews. After the field trip, I interviewed with the sociologist of the Smart Village to understand what type of actions taken to integrate with the villagers rather than technology. Both interviews I logged in written format immediately after the visit. I also transcribed my field notes into blog posts. The preliminary visit was critical to understand that the products or services that Smart Village provides have a different purpose based on the stakeholder that is desired to be involved in the process. As a result of this inference, I decided to focus on the

relationship among the actors with reflecting on Smart Village's goal on social innovation. I also decided that I should understand the natural setting of the actors in the Village. This led me to conduct an ethnography to complete my study. In the next section, I will cover how I conducted an ethnography.

Table 5.2. *Interview participants of preliminary visit*

	Participant Pseudonym	*Sex*	*Position/ Occupation*
Interview I	Yetkin Kumruoğlu	Man	Technology Officer at Smart Village
Interview II	Bahar Algöz	Woman	Sociologist at Smart Village

5.3.2. Data Collection Second Phase A: Ethnography

As Silverman and Marvasti (2008) indicate, to understand a group of people, one should conduct observation within the group for an extended period. They emphasized what anthropologists argue as the ethnography (Silverman & Marvasti, 2008), where the researchers seek for the behavioral patterns, language, actions, or culture of a group in their natural setting for a period (Creswell, 2009). Ethnography provides a deeper understanding of people's social worlds by becoming a part of their community, which helps the researcher to create a detailed description of people. (Ritchie and Lewis, 2003). Ethnography was a useful method for this study to understand the behavioral patterns of the villagers and Smart Village members, their relationship among each other and with the organizations, their interaction with technology and how they collectively constructed these relationships.

Ethnography deals with the social phenomenon, rather than a generalized fact about a context (Flick, 2009). The role of the ethnographer is to understand the patterns that are difficult to separate from each other. In fact, ethnography visualizes the patterns and representations that might not seem directly essential for the participants (Bogdan & Biklen, 2007). Therefore, ethnography gives a larger view of the context and individuals for the researcher. In addition to understanding culture, ethnography also

58

allows the research to understand specific settings, systems, or fields (Gray, 2009). As a researcher who is unfamiliar with the village culture, agricultural production and technologies, ethnography was a valuable technique for data collection. In an ethnographic research, observation is a primary data collection technique, which is strengthened by interviews (Gray, 2009). I conducted non-participant observation to understand the working dynamics inside the Smart Village, the fieldwork, the facilitating technologies as well as actors' relationships with each other. I also observed areas in which the Smart Village interacts with the villagers, such as the Smart Pasture. I also observed the plots outside the Smart Village area to understand modern agriculture and animal breeding.

5.3.2.1. Conduct

I conducted an ethnographic study in June 2018 for eighteen days in the Village. Before going to the field, I talked with the founders of the Smart Village about the most suitable period for this research. The period was chosen according to the availability of the Smart Village as well as my schedule. It was planned for me to stay in the guesthouse inside the Smart Village; however, in that period, the guesthouse was not entirely ready for stay. The founders were also apprehensive for my stay inside the guesthouse since there was no security inside the Smart Village. Resulting from this, the founders of the Village offered me to stay with them in another neighborhood which was close to the Village. I spent my daytime inside the Smart Village and the Village, at night I spent my time mostly in the founders' house.

June was a harvesting period according to the climate of the region. Therefore, I did not have the opportunity to observe the technologies of cultivation and plantation. In addition to that, in that period, Smart Village decided to stop trainings and other programs to revise the previous trainings and programs. As a result of this, I could not observe the programs of the Smart Village. During my ethnography I observed the following spaces and occasions as illustrated on Table 3.3.

Table 5.3. Observation of spaces and occasions

Spaces	Occasions
Smart Village offices	Meeting with a sponsor
Plant breeding plot	Field trips with sponsors and guests
Smart pasture area	Machine harvesting by field workers
Villagers' plots	Traditional harvesting by field workers
Village center	Field workers setting up drip irrigation
Villagers' garden	Field workers using pesticides

In the first days, since the Village is a small area, everyone recognized that I was a stranger. People from the Village tended to view me as a Smart Village employee because anyone new coming to their village would mostly be a new employee. Therefore, I spent a significant amount of my time in the first days talking with the villagers and explaining them about my research and my relationship with the Smart Village. After a week, they started to introduce me to each other as a researcher from Ankara rather than an employer of a Smart Village. This increased my interaction with the Villagers and eased the process of interviews.

5.3.2.2. Entering the Field and Consent

Before moving into the relationship among the actors, it was important for me to understand the essentials of the Smart Village project as well as what agricultural production is. To do that I needed to visit the Smart Village plot and know more deeply their everyday activities. After our first meeting in İzmir, I asked the general manager of the Smart Village his permission for a preliminary visit. Four months after my preliminary visit, I mentioned the general manager about my research aim in detailed, and I took his approval for the ethnography study.

When I arrived in the field, the general manager presented me to the employers of the Smart Village as well as some Villagers who we encountered. On that day, I explained my research to field workers and office workers and took their verbal consent. I also took written consent of members of the Smart Village that I have interviewed. During my stay, I am presented to anyone who came for a visit as a researcher and I asked their verbal consent about my study with the support of the Smart Village managers.

I started my observations initially by understanding agricultural production. I focused on what type of activities that Smart Village does inside their plot as well as outside the Village. However, for the field security of the Smart Village, I was not allowed to visit the plant breeding plot alone. Therefore, I went to the plot in occasional visits of the agricultural engineers. That was helpful for me to ask about the crops, products and understand agricultural terminologies.

After my familiarity with agricultural production increased, I started observing plots outside the Smart Village and interacting with the villagers. I began my observations in the Smart Pasture area since every evening between five and six o'clock villagers were coming there to take their animals back home. In my observations in the Smart Pasture, plots, and houses of the villagers, I also presented myself and received verbal consent about my study.

5.3.2.3. Field Notes

Field notes are the traditional way of recording the data from observations in ethnographies (Hammersley & Atkinson, 2007). It is an essential tool for researchers to log what they see, experienced, and think during the data collection part of their study (Bogdan & Biklen, 2007). Hammersley & Atkinson (2007) also mention that in some research, taking notes can be unnatural or disruptive to the environment. Very similar to their arguments, it was not comfortable to spend time in a plot, an animal breeding land or a house of a villager to take notes. Some of the villagers were questioning my notes even though I did not consistently take them. Therefore, I combined two note-taking techniques; jotting notes and diaries.

In the daytime, I jotted notes in my pocket notebook and my phone. I took as many notes as possible during my observation in available fields. I used the pocket notebook to write down my observations when I was alone. When I was observing places or people, I jotted inside the notes on my phone for not disrupting people. In the evening, I transcribed my field notes and wrote the reflections of the day into a diary. According to Bernard (2002), a diary is an essential tool for an ethnography project since it gives the researcher information about how to interpret the field notes as well as the researcher's judgments and biases. Figure 3.1 shows a sample page of my jottings and Figure 3.2 shows a diary page.
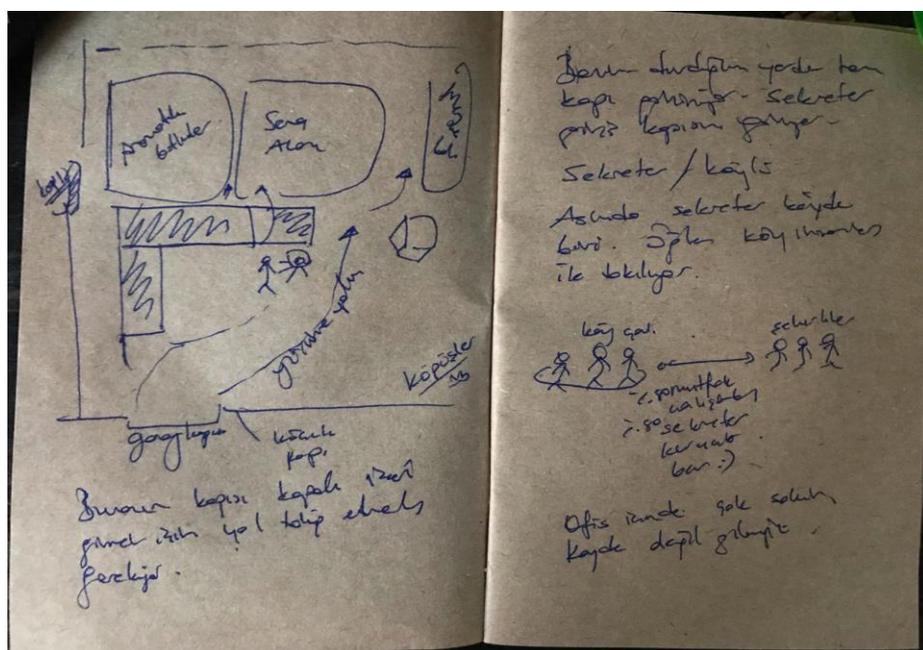
Figure 5.1. Jotted notes
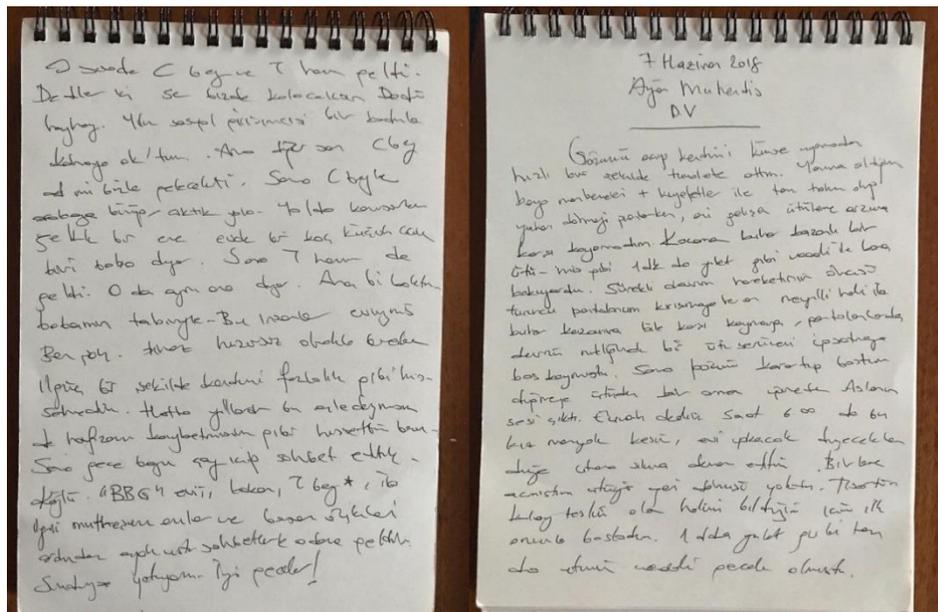
Figure 5.2. Diary pages

5.3.3. Data Collection Second Phase B: Interviews

In ethnographies, observations give the researcher a perspective about the context. On the other hand, it is critical to understand the point of view of the participants (Legard, Keegan, & Ward, 2003). Interviews are essential to understand people's social world through their definition based on a form of conversation with a researcher (Legard, Keegan, & Ward, 2003). According to Hammersley & Atkinson (2007) ethnographic research gives the researcher the idea about whom to interview. In ethnographic research, the interview is an essential method to grasp the experiences of the participants. It can be developed in an unstructured manner since the ethnographic research embodies unexpected encounters in its nature. Through interviews, the researcher can compare whether what people said fit with what the researcher observes. This comparison helps the researcher understand the participants' perspectives (Hammersley & Atkinson, 2007).

According to Gray (2009), interviews are useful to understand feelings and attitudes, explore stories, reflect on events. A method to conduct interviews is semi-structured interviews, which allow the researcher to probe the participant's experience on a

specific topic. It gives the researcher an understanding of individual experiences (Glasne, 2011). It also initiates a richer conversation about a subject that fits with the research objective (Gray, 2009). In addition to that, Hammersley & Atkinson (2007) argue that in ethnographic research, semi-structured format of interviews is preferred since the interviewees are different from each other in terms of their role in the research. This difference changes the form of the questions. Therefore, ethnographers usually interview with a list of topics to be covered and there is no sequence of the topics since their goal is to become the natural part of the conversation. (Hammersley & Atkinson, 2007).

For the purpose of this research, I conducted interviews during the ethnography. I chose to conduct interviews during my ethnography to understand other people's perspectives which as a complementary and support data of my field observations. It was also important to understand the stories and experiences of different participants representing different stakeholders through interviews. In order to talk with a diverse participant group, I followed a semi-structured format with clarified topics (see Appendix A). I covered some main topics during the interviews and probed to deepen into topics in which the participant puts importance.

5.3.3.1. Sampling

Williamson (2006) argues that information richness of qualitative research's depends on the samples that are purposefully selected, which is called as purposive sampling. A sample can be chosen through the representatives of the community (Gray, 2009). In research as ethnographies, researchers prefer non-probability samplings, in which they select their samples according to specific criteria. In cases where different people have different views about a phenomenon, researchers prefer heterogeneous samples. Heterogeneous samples allow the researcher to identify the main themes that have an intersection point among different groups of people (Ritchie, Lewis, and Elam, 2003). In light with these arguments, I selected the participants of the study from among individuals from both the Smart Village and the villagers.

I selected participants from the Smart Village based on their distinctive position in the company as well as their level of interaction with the stakeholders such as villagers or sponsors. I started my interviews with the founders of the Smart Village. Later I continued with Agricultural Engineer, Technology Officer, and former Children Club Director. All the participants are chosen depending on their level of interaction with the stakeholders; they all participated in design, implementation and development phase of at least one program for the villagers. I also interviewed with the field workers employed in the Smart Village. Majority of the employers are chosen from the Village (see Section 4.3.3) based on having a role to bridge the Village and the Smart Village.

To find potential participants from the Village, I used a snowballing technique. Snowballing is known to find people with a specific criterion by asking the previous participants of the interviews (Ritchie et al, 2003). After interviewing initially with the Smart Village representatives, I asked them about potential participants from the Village who also participated their previous events and programs. I also asked whether they know villagers who try some of the facilitating technologies in their own lands. Since the Village is now very crowded, the Smart Village interacted with many of the villagers, including villagers from the Neighbor Village. Resulting from that I particularly selected participants who participated in the entrepreneurship program (see Section 4.5), training programs (see Section 4.6) and farmers who prefer to apply the facilitating technologies in their plots as well as those who prefer not to. I also found some other participants from the Village based on the suggestions of the Villagers.

I prepared a mixed interview schedule among participants from different representation groups. In other words, I did not talk to participants in an order depending on to the representing group. The reason for that is that each participant led me to another case that gave me a deeper or a new perspective about my research and supported my participant selection. Table 3.4 shows the order of interviews and the participants' occupation or position. It needs to be noted that, farmers who are stated

as Farmer/Unemployed indicates that farmers who do not consistently do farming regularly rather they work daily and noticed as unemployed (see Section 4.3.3).

5.3.3.2. Conduct

In total I interviewed 21 individuals in 13 interviews. The interviews were conducted in face-to-face meetings in order to facilitate an in-depth discussion. Interviews of the Smart Village representatives were held inside the Smart Village plot. Interviews with the office workers were conducted in the office meeting rooms in a quiet area and the duration of the interviews last between 60-90 minutes. I took the written consent of those participants (see Appendix B) and voice-recorded the interviews. The main topics covered with the office workers are the project aim and goal, experiences regarding the development and application of the programs, trainings and activities and experiences regarding the interaction with the villagers.

Interviews with the field workers are conducted in the field area since they did not have the appropriate time for interviewing due to their tight working schedule with only ten minutes break in every two hours. Also, lunch breaks were not suitable for interviewing due to the crowd. Due to these reasons, interviews with field workers lasted shorter up to 30 minutes. One exception was Hüsnü Dağdelen whom I interviewed inside the office which lasted up to 60-90 minutes. He was an exceptional worker inside the Smart Village (see Section 4.3) that he spent more time on the interviews compare to other field workers. I took the verbal consent of those participants and voice-recorded the interviews. The topics covered with the field workers are about their traditional agricultural production experiences, their relationship with the facilitating technologies and the new crops, and their experiences about the Smart Village model.

Table 5.4. *Interviewee pseudonyms, their representing groups and their position/occupation.*

	Participant Pseudonym	Sex	Position/Occupation
Interview I	Damla Yakın	Woman	Founder
	Ali Işık	Man	General Manager
Interview II	Figen Yüksek	Woman	Agricultural Engineer
Interview III	Selime Hakyemez	Woman	Field Worker
Interview IV	Ahmet Dağdelen	Man	Elected Neighborhood Representative
	Dilşad Sucu	Woman	Field worker
Interview V	Ayşe Dağdelen	Woman	Field worker
	Süheyla Derviş	Woman	Field worker
Interview VI	Yetkin Kumruoğlu	Man	Technology Officer
Interview VII	Halime Esentürk	Woman	Secretary – Former Children Club Responsible
	Emine Fırıncılar	Woman	Farmer/Unemployed
Interview VIII	Gülden Koroğlu	Woman	Farmer/Unemployed
	Sakine Fırıncılar	Woman	Farmer/Unemployed
Interview IX	Fadime Uslu	Woman	Farmer /Unemployed
	Kerim Çorapsız	Man	Farmer
Interview X	Yahya Fidan	Man	Farmer
	Naim Tellioğlu	Man	Farmer
Interview XI	Hüsnü Dağdelen	Man	Field Worker (Kahya)/Farmer
Interview XII	Ali Işık	Man	General Manager
Interview XIII	Osman Canatan	Man	Farmer
	Kemal Türkoğlu	Man	Farmer
	Kazım Tavukçu	Man	Farmer

Interviews were held with the male participants from the Village in coffee houses. I asked Smart Village representatives to introduce me to one villager that participated in programs or trainings or using facilitating technologies. After they introduced me to the elected neighborhood representative, I talked with him in person in a coffee house. In order to interview with the participants in Interview X, I randomly went to the coffee houses and asked for the names. Since it was the harvesting period, many men were spending their time inside the coffee houses together playing games, drinking tea or watching television. As a result of this, I found the other participants in the coffee houses. The problem I faced with the coffee houses is that even though the topic was specific, when there was someone else curious about our interview, he sat directly to the table and participated in the conversation. Even though this brought richer perspectives on some subjects, it also interrupted the conversations often and caused participants to share their experiences limitedly. In Interview XIII, a Smart Village representative talked with Osman Canatan, who tried facilitating technologies and special crops introduced in the Smart Village, about my research. I booked a time with him, and I went to the neighbor village with a car together with a Smart Village representative. This interview was also held in a coffee house, together with the other two farmers. All the interviews with male participants from the Village lasted 60-100 minutes.

In interviews VIII and IX, I talked with the female participants from the Village in their houses. Unlike men, women of the Village spent their daytime inside their houses rather than in a public space as coffee houses. I occasionally visited their houses, checked if they are in the house, and asked for a suitable time for an interview by introducing myself and my research. In Interview VIII, the participants were former participants of the entrepreneurship program (see Section 4.5) except Gülden Koroğlu. Because of the crowd, the topic was interrupted many times, and the participants in those interruptions lost the focus. Those interviews lasted up to 60 minutes.

The main topics covered with the participants from the Village were about traditional agricultural production and its challenges, the changes they faced with after Smart

Village in terms of new crops and facilitating technologies, their expectations about the project and particularly the entrepreneurship program, trainings and social and cultural activities. I took verbal consent of all the participants and voice-recorded the interviews.

5.4. Data Analysis

Analysis of the data started with the transcription and analysis of preliminary visit. The preliminary visit notes and interviews are transcribed in December 2017 and later used in the determination of themes with respect to the interview and field note analyze. I did not conduct a structured analysis with the preliminary visit data. I continued with the transcription and analysis of the field notes and diaries. The interviews are transcribed and coded into two cycles. In the first cycle, I identify general topics. In the second cycle, I organize the topics into specific themes and subthemes. Figure 3.3 illustrates the data analysis process.

5.4.1. Analysis Ethnography Field Notes

As Saldana (2009) explains, in ethnographic research the researcher's initial question is to understand what is going on in the field. In order to answer this question, he suggests descriptive coding of the rich field notes (Saldana, 2009). By descriptive coding Saldana (2009) refers the data collected to summarize the data into short description that identifies a topic. As I mentioned in Section 3.3.2.3, I daily transcribed my field notes and additionally I wrote diaries. I analyzed the codes out of my diaries and field descriptively in order to generate topics. I generated the following topics;

- Functions of interventions
- Effects of space for interaction
- Use of space
- Use of facilitating technologies
- Villagers' interaction with facilitating technologies
- Villager Smart Village interactions

69

The topics are used after the analysis of interview data and contributed to the generation of themes.
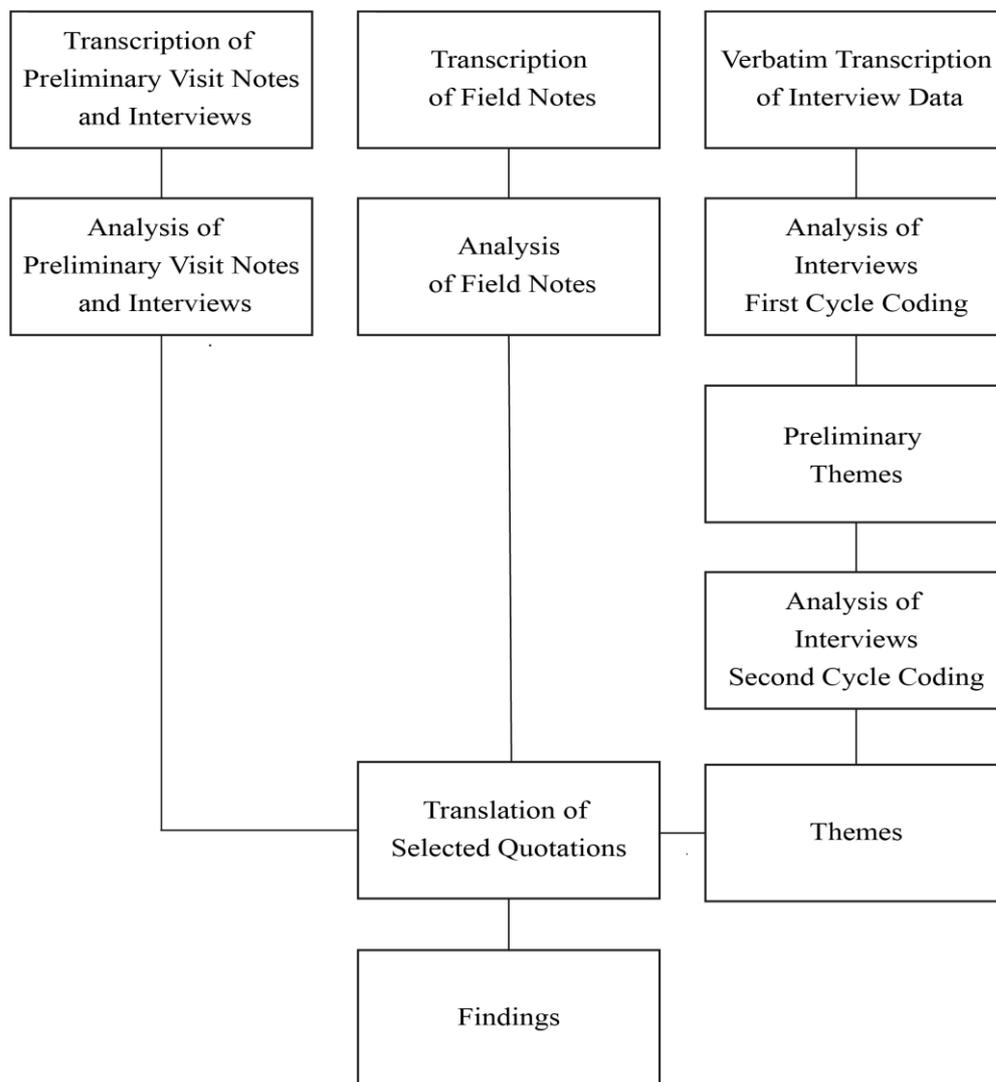
Figure 5.3. Data analysis phase

5.4.2. Transcribing the Interview Data

Saldana (2009) refers to transcription as where the coding begins. It gives the researcher a sense of the nature of a relationship, tones, and feelings. Both Gray (2009) and Seidman (2006) suggests the researcher make a full transcription of the data to reflect on the real conversation rather than selecting some data, which might create biases. Even though it is time-consuming, a verbatim transcript gives the researcher

the memory of the data collection process and increases the researcher's control over the data (Seidman, 2006).

In this study, I transcribed 11 interviews as a full conversation. Most of the parts of the transcription I write them manually. To transcribe some interviews, I used online software speechnotes.co to accelerate the writing process. In the interview XIII, I could not transcribe some parts of the conversation because participants moved in the place multiple times, so the voices were mixed. Also, they did not speak one person at a time so that it was difficult to transcribe. Similar to this interview, in Interview X, there was a noise of a football game behind the voice recording since I interviewed in the coffee shop. Even though the game did not interrupt our conversation on that day while transcribing, I could not use most of the data because of the noise.

5.4.3. Analysis of Interviews

Hammersley & Atkinson (2007) mention that analysis of the data in ethnographies involves the interpretation of meanings of human actions or descriptions and explanations of the cases. To capture the experiential insights shared by the participants, I conducted a two- cycle coding technique of my interview. In the first cycle of coding, I used descriptive codes to define the main topics. For interviews with more than one participant, in addition to descriptive coding, I used structural coding to understand the theme discussed collectively (Saldana, 2009). At the end of the first cycle coding, I categorized the codes according to the actors and their relationship with each other. Figure 3.4 illustrates a part of the first cycle codes.

In the second cycle coding, I coded the data through pattern coding, which examines actor relationships by focusing on the patterns of interviews (Saldana, 2009). I seek for the patterns of the codes and develop sub-themes out of a pattern. In that coding cycle, I recognize that each strategic design intervention of the Smart Village creates a different mode of relations. Therefore, in the analysis, I consider each pattern under a specific type of intervention. The Table 3.5 illustrates some example codes.

71
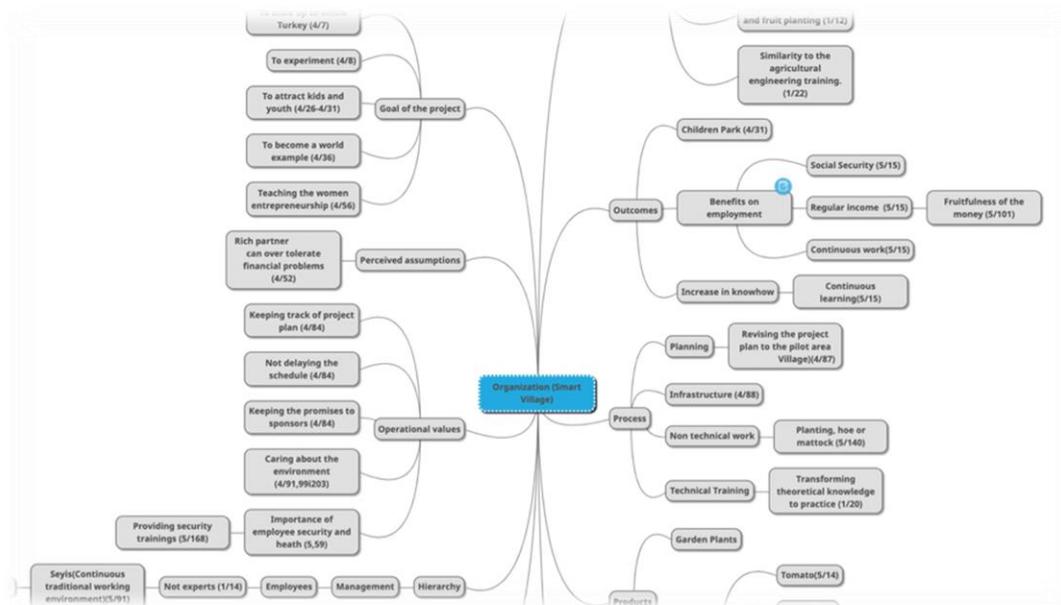
Figure 5.4. Part of the descriptive code tree

5.5. Translating the Quotations

All the interviews in this study were conducted in Turkish. After selection of the quotations I translated the selected quotes into Turkish. The translations are close to verbatim translation. However, I encountered some culturally specific terms and sentence formats and speaking manners. As a researcher who got familiarity with the meanings of this language, I translated the quotes according to the suitable format in English.

5.6. Limitations of Data Collection Process

The main limitation of the data collection process was that I could not have the opportunity to directly observe the programs and events that Smart Village established as a design intervention. The primary reason for that is the city I live as a researcher is about 600 kms away from the Smart Village plot. Therefore, it was not logistically possible for me to visit the land for a more extended period. Second, after conducting

my first visit in November, I requested from Smart Village representatives to share with me a program and event calendar. However, they were not able to provide such data. Resulting from this, I could not match my schedule according to the programs and events held in the Smart Village. Since I could not observe these events and programs, I analyze the programs only through the perspectives of the actors.

Table 5.5. *Example patterns and codes*

Example Patterns	*Example Codes*
Resistance to Entrepreneurship Program	Lack of ownership
	No sanction
	Lack of short-term return
The use of Smart Pasture	Low risk
	Short term return
	No hierarchy
	High ownership
Factors effecting crop selection	Return of investments
	Safety
The use of Plant Production Area	Sense of security
	Employment opportunity

Another limitation was the barrier I faced due to field security. In the Village, I did not conduct the interviews in a specific schedule. I occasionally went to the Village center to find out whether the participants are available for an interview. As a novice person in the Village, I demanded support for the Smart Village members for field security for these occasional Village visits. They provided me with an assistant that introduced me to the villagers at the same time participate in the interviews for field security. The assistant originated from the same city, so he was talking in the same accent as the villagers. His presence supported me in understanding the language of the villagers and to welcome them in a warmer tone. On the other hand, since the

73

assistant was an employer from the Smart Village, his presence in the interview environment made some villagers abstain from talking in the beginning about their feelings and experiences towards Smart Village.

Lastly, conducting an ethnography required me to meet with the villagers in their natural setting and initiate the conversation as a part of a daily event. A setback of this method was that I had to conduct three of my interviews in a group setting. When there were more than two people in a conversation, sharing experiences and feelings were not as possible as sharing them alone. Especially in my interviews in the coffee houses, the circulation of people coming and going to the table changed the topic and perspectives of the people that I was interviewing. In some parts, my questions turned into group discussions with started and ended which different arguments. I did not use some of this data in my analysis.

5.7. Summary

In this chapter, I presented the scope of the research, the research approach, and the data collection techniques used in the study. I continued with the analysis of data and limitations of the study. I used qualitative research methods in this research since I was focusing on how specific interventions shape the relationships. Methods of qualitative research were for understanding social worlds, experiences, and interaction with each other.

Data was collected in two phases. Since I was an outsider of the rural context and the Smart Village project, I made a preliminary visit to identify variables and associations about the subject. In the second phase, I conducted ethnographic research for an extended period and collected field notes during the study. I used in-depth interviews as a complementary method for ethnography, which provided a more detailed analysis of individuals as well as the interventions. As a result of the ethnographic research and interviews, I collected insights related to the Smart Village design interventions concerning rural dynamics, expectations of different actors, and their relationships. I transcribed all the field notes and interviews and used two-cycle coding to analyze the

transcriptions. Finally, I illustrated examples of themes of interviews and shared the limitation of the methodology in the research context.

CHAPTER 4

FINDINGS

In this chapter, I present the findings of this research. I initiate the presentation of findings with a descriptive history of the Smart Village based on the review of the documentation provided to me and the interviews. I continue with six strategic design interventions of the Smart Village to present their concept to the villager. The six sections are presented in the following order; Facilitating Technologies on Crop Selection, Plant Breeding Plot, Smart Pasture, Entrepreneurship Program, Trainings, and Social and Cultural Activities.

7.1. Overview of the Smart Village

A social enterprise in Turkey initiates the Smart Village project in 2016. The social enterprise has the vision to leverage the economic conditions of the villagers in Turkey and started their operations fifteen years ago. Their primary services consisted of four projects;

- A digital agricultural marketing platform
- A news website for agricultural and rural news
- A mobile farmers club program that sends farmers mobile phone information about daily marketplace prices and information about regional weather conditions
- the Smart Village Project

In 2016, in cooperation with several sponsors, the company established a smart farming facility inside a village in the Aegean region of Turkey. The project aims to create an example model for villages by increasing farmers' control over the production through smart technologies. Those technologies gather the data of

environmental conditions which can be interpreted by the user to intervene the agricultural production. For example, embedding a humidity sensor to the crop plot and tracking the dryness level of the soil provides the farmer with the information of the exact watering time of the crop. Figure 4.1. and 4.2. illustrate the smart technologies used in the Smart Village plot. They also use facilitating technologies as complementary of the smart technologies. Figure 4.3. illustrates mulch and drip irrigation as facilitating technologies.

Figure 7.1. Humidity sensor placed inside the lettuce crops.

Figure 7.2. Humidity sensor placed inside the lettuce crops.

Figure 7.3. Drip irrigation and mulch

The project is planned in the İstanbul. In that period the team was visiting several villages to investigate plots and village dynamics. The Village is chosen after a search of a field that is suitable for the project goals. The general manager Ali Işık is explained their choice of the Village as following:

This project is not a project to change here. This entire project can scale to Turkey. We chose this Village because in these plots we can try a variety of crops which we can scale to Turkey. But first, change had to begin here. We identify this Village, mainly because the resistance is very high in this Village. It is a village in Turkey's average. You can model Turkey from here in terms of its resistances, sociology, and environment. Although it has an economy under Western conditions, it has an economic, social, and environmental structure equivalent to a village with challenging conditions in Eastern Anatolia. We measured this with a university professor of agricultural economics.

His explanations illustrate two criteria in their choice of the Village: First the productivity of the land and second suitableness of the Village as a test place for the appropriation of the Smart Village model sociologically, environmentally and economically. They also chose the Village since there was enough land that can be used for the project; a rarely used marsh plot. They rent the plot for twenty-five years from the municipal government.

The Village population is about 500 people with 250 houses. Many of the farmers prefer to own farmlands outside the village center where almost all families have a small garden in front of their houses to plant products for themselves. The land that is rented for the Smart Village project is close to some of the houses of the villagers, yet it is not directly in the center. On the other hand, there is no such big land closer to the Village center as the Smart Village, which makes the land significant inside the village. The Smart Village project area consists of 88 acres of land for planting and 200 acres of land for animal breeding. Previously the plot is used for different purposes as Ali Işık explained its former conditions;

It was the land of the villagers. An area that the Village uses like pasture. People used to graze animals here. Then along with the Metropolitan Law, this place allocated by the municipalities. Because the municipality did not sell

80

here to the villagers, the villagers thought that we buy this land for free. However, the municipality already sold similar places to pay debt, workers' salary or invested. We did not let them sell this place. We rented it. This is still the municipality's place. It is going to stay with us for 25 years, and we will hand it over after 25 years.

Since the land was in use of the Village, the allocation of the land gathered the attention of the villagers. They initiated their discussions with the Village starting from the elected neighborhood representative, Ahmet Dağdelen. He explained the following:

They said, "We will bring technology and farmers together; we will bring technology to animal breeding." And we said, "Why not?" The land was already idle. I said it belonged to me, but it's passed to the municipality. They said, "We will get it from the municipality. You help us out.", I said, "Of course, if something like this is going to contribute to the economy of the farmer if a few people are employed by here and if it will add value to our products, why not?".

According to him, they initially asked for the support of the elected neighborhood representative for the allocation of the land. It was seemingly a promising contribution to the land ant the Village. Resulting from the allocation of the plot, they started to build the infrastructure of the facilitating technologies such as drip irrigation and other smart technology automation, such as metrology station, firewalls, and data processing systems. In the meantime, the Smart Village team moved into an office in the city center and worked for the design phase of the model. In that period, project implementation team spent most of their time in the coffee houses, presenting the project and listen the expectations of the Villagers. When they complete the infrastructure of the plot and transform the marsh into an into a suitable for farming ang animal breeding (See Figure 4.4 and 4.5) they moved inside the Village.

*Figure 7.4.*Before after pictures of the plant breeding plot

*Figure 7.5.*Before after pictures of the pasture

7.1.1. Operations of the Smart Village

Inside and outside Smart Village plot, Smart Village executes several operations to achieve their goal. I will explain the primary operations that this thesis focused on and a brief history of the services.

- **Plant Breeding Plot**: A plot established in the Smart Village land to grow a wide range of plants by using smart agricultural technologies and facilitating technologies. In this land, there are fruit crops, vegetables, greenhouse plants, medicinal, and aromatic plants. The goal of establishing this plot is to build and test the technologies as well as to demonstrate the use of them for the villagers. Also, it is a land to show the villagers alternative crop opportunities that they can try.

- **Smart Pasture**: An area established for animal grazing that is open for the common use of the villagers. It consists of a smart milking unit and stores all the milk of the Village into one cold tank. The Smart Pasture aims to increase the quality of the milk and wellbeing of the animal. Result of this, they expected an increase in the income generated by animal breeding.

- **Entrepreneurship Program:** A program established to support women farmer's entrepreneurship. The program provides the women in the Village greenhouses inside the Smart Village to raise their crops with the support of Smart Village experts, facilitating and smart technologies.

- **Training Programs:** Smart Village provides trainings in agricultural production and husbandry for farmers all around Turkey. The content of trainings also presents the setup, use, and maintenance of facilitating and smart technologies.

- **Social and Cultural Activities:** To integrate with the members of the Village and submit the model of the Smart Village, Smart Village organizes social and cultural activities in their plot such as children club.

7.1.2. Organizational Structure of the Smart Village

The project is established by a social enterprise that is operating as a company and uses its profit for social impact. The enterprise is initiated the project with the support of several sponsors. Those sponsors allocate all the resources needed to facilitate operational activities of the project. The main sponsor supports the Smart Village project directly with financial support. This support is used for the allocation of the land as well as the fixed costs such as infrastructure costs or labor expenses. There are also sponsors inside the project that provides in-kind support for agricultural products, services and machinery. These includes, provide seeds, pesticides, fertilizers, facilitating technologies, smart technologies, machinery, and equipment. Those sponsors might prefer to be a part of this project since it allows them to display their products and services for their target audiences, farmers in the first place. The agricultural engineer exemplified how the operational processes held with the sponsors as follows:

> We are currently planning what we will do in the fall season. Before this period's harvest, I need to get the new plan out and let our sponsors know so that they can talk to the seeders. Because these seeds have a growing period. Some of them take 40 days, some of them take 90 days, and there is a catch-up period until I can get them, so I must give them a long time before they made the next sponsor announcement.

As she explained illustrates, the primary operations held in the Smart Village plot planned in coordination with the sponsors. The presence of the sponsors defines the economic structure of the project as well as shows the dependency inside the operations of the project. Another important aspect that defines the organizational structure inside the Smart Village is the project implementation team. As I explained above, the social enterprise that facilitates the project runs the operations, however, they build a brand-new team inside the Village special for this project. The organizational structure and roles in the team are demonstrated in the table below.

Even through this table shows a personal list that demonstrates a 50-person team, in the meantime I visited the Smart Village, there were about 20 employees. As a result of this some employees had more than one responsibility especially ones with managerial positions. In this section, I explained the brief history of the Smart Village, its primary operations, and organizational structures. In the following section, I present how facilitating technologies effects the crop selection process.

7.2. Strategic Design Intervention I, Facilitating Technologies on Crop Selection

In this part, I present how facilitating technologies impact, and are impacted by, the way farmers plan what type of crops they will plant for the season. I initiate my discussions from the existing conditions of the farmers. I continue with how facilitating technologies are being used and perceived by farmers during the crop selection process. Finally, I examine the Smart Village as an establishment that affects the decision-making process of the farmer during crop selection.

The modern agriculture in the plains where I conducted my research, the farmers mostly prefer to raise crops such as cotton or corn in large agricultural lands. In smaller plots, they plant a mix of vegetable crops and fruit crops. Currently, crop selection plants not defined through the land size; however, due to the changes in several factors in agricultural production such as changes in the climate and seed types, scope of the governmental initiatives, monetary return cycle of the crop of investments and supports on crop maintenance and selection. In the following section, I start with the changes in the climate and seed types and how it affects the villager choice of using facilitating technologies.

*Table 7.1.*Organizational Structure of the Smart Village
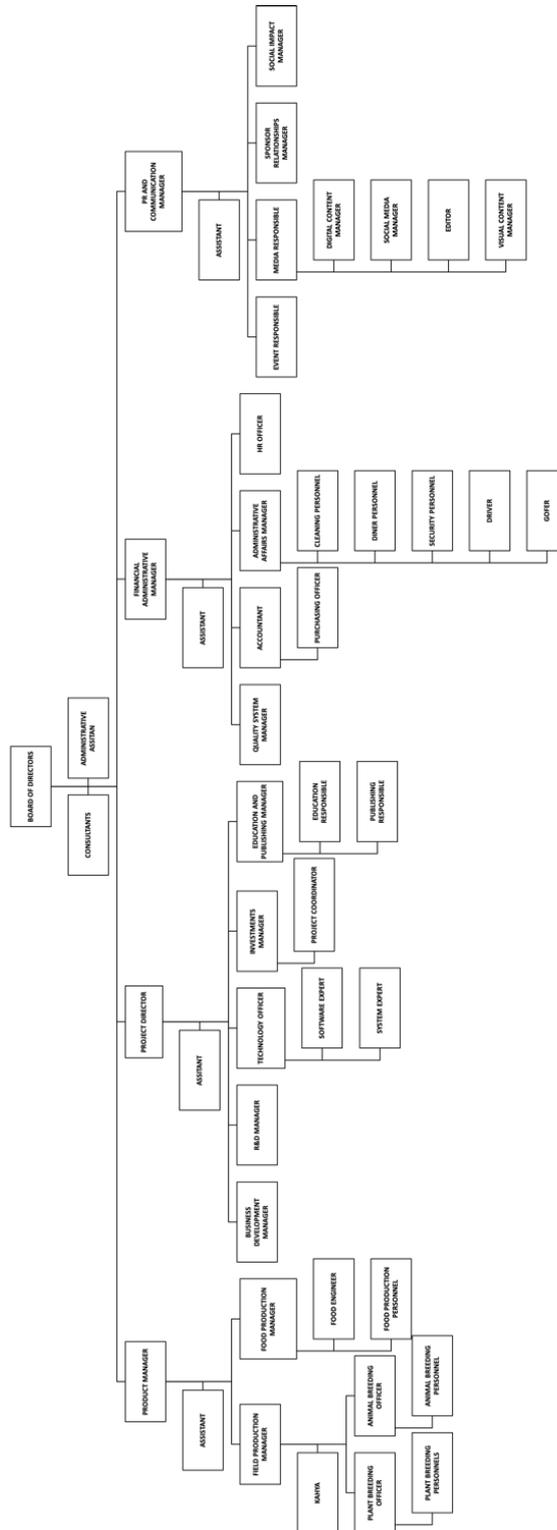
7.2.1. Changes in Climate and Seed Types

Before moving into the use of facilitating technologies in the crop selection process, I start with the current context within which farmers select their crops. The rapidly changing climate and biologic intervention of seed types have been affecting the usual way of planting and harvesting new corps, which creates a complicated selection process for the farmer. Farmers face the risk of losing the corps since climate change brings unpredicted outcomes. Kemal Türkoğlu living and working in the region more than 30 years mentioned the reasons for him and his fellow farmers in crop selection as flows;

> Due to these climate conditions, cotton gained some added value. The farmer sees the guarantee in cotton. Just to have the harvest, we are thinking as "at least it's mine".

Because the farmers cannot predict how the climate will influence the crop during the cultivation process, they remain with the plants that they have a precise return on the expenses that they have made for planting. In that way, they decrease the uncertainty that climate change produces. They consider their choice of corps as cotton as a guaranteed investment, that has a low risk of loss.

To prevent this uncertainty, the Smart Village offers the farmers several technologies to increase. The farmers' control over the cultivation process. An example of this technology is the humidity sensor, which provides data on the humidity of the soil to guide the farmer on the frequency of the water irrigation. To make these technologies visible to farmers, Smart Village plants a wide range of crops in its land.

Even though the Smart Village plants many different crops such as melon and lettuce, most of the farmers prefer to plant the crops like cotton as a safeguard such as a participant above mentioned. Kazım Tavukçu, another farmer who has tried different crops in his land, described the reasons why farmers prefer cotton by comparing it with melon products. He emphasized the unfamiliarity of the seeds and low yield of the cultivation areas.

The planting areas have changed. Our melon (the seed in the region) comes across another melon (that does not belong the region). This melon (the melon in their region) starts from Manisa. Formerly used in certain regions. But now there is melon all over the Turkey. I would harvest 4 tons without mulching because of the climatic conditions in here. Now I cannot even get a ton when I plant it. It fell too low. The full color and odor yield of the product fell. This is where cotton gains value.

This description of the participant shows that when it comes to crop selection, his personal experiences on changes in the seed types over the years are more persuasive than the current plants that are growing inside the Smart Village plot. Namely, Smart Village's actions on increasing the control of the farmer on different seed types through facilitating technologies are not affecting the farmer's decision since they have been mostly deciding based on their know-how. In this section, I explained how the changes in climate and seed types affect farmers' decision on crop selection, in the next section, I will explain how the governmental incentives on specific crops affect the farmers affect their decision on crop selection.

7.2.2. Governmental Incentives on Specified Crops

In addition to climate change, the second reason that has been affecting the crop selection process is the governmental incentives and supports in selected brands for fertilizers, seeds, and pesticides. According to the Kazım Tavukçu, the monetary incentives on selected crops motivate the farmer, yet the harvest is less fruitful than usual.

Before harvesting with machines, Nazilli Cotton Research Institute had cotton called Nazilli 84, it broke the record in this plain. Reason? The climate is the climate of Nazilli, it is our climate. In other words, the best seed that can grow in the Aegean region. Now, they are imposing you the seed of American firm Bayer. It is not clear whether you like it or nor. As I said, 6-7 pieces (in a common land) are mine but when I plant Bayer's seed it never works. This soil

in our region wants a different seed. But the policy says that if you do not bring the bill, there is no incentive for you. Whose bill am I going to take over there? Bayer or Beyaz Altın. They only give the incentive for those.

Kemal Türkoğlu stated his idea about products such as melons which do not worth taking risks;

What we call melon as stinky and leaky. You don't have a chance to store it. There's no such thing in cotton. At least you got an incentive, you receive an incentive on your account.

Kazım Tavukçu described above; farmers prefer to choose particular crops that have governmental incentives on even they do not want to raise it. Where Kemal Türkoğlu mentioned, the presence of incentives in selected crops lowers the appallingness of the crops as melon, which has difficulties in the cultivation process and a heavier workload. This shows that the farmers perceive the governmental incentive system as a risk-averse system during the cultivation process. However, the incentive system made the farmers more dependent on additional benefits and decreased the farmers' choice of crops. They remain with the seeds that are promoted in the incentive system.

The discussion above shows that the rural development systems such as government incentives have a significant effect on agricultural production of the farmers that I have interviewed with. Inside these systems, the farmer's tendency is always to decrease their risk. In the following section, I indicate how facilitating technologies are being used and perceived by the farmers in the Village. I will initiate my discussions from the requirement of investments and the return on investments.

7.2.3. Approach of Farmers to Facilitating Technologies

In this section, I explain how the farmers approach facilitating technologies. In the modern agriculture land, farmers have had an already established infrastructure and know-how of planting and cultivation of corps. For example, based on my observations, many farmers mostly prefer an irrigation technique called "wild

irrigation". In wild irrigation, farmers dig a part of the soil and open a gash near where they planted the crops. The gash continues along with the row of crops. In this way, when the farmer waters one gash, the water leaks around the other gashes. That way, they water the plants.

Figure 7.6. Wild Irrigation of a tree in the Village

Figure 7.7. Wild irrigation of a plot (aboutcivil.org, 2017)

Wild irrigation is known as an old technique. It is also known as a technique that the farmer lacks control over the amount of water that the plant needs, and often this

system consumes a lot of water. To prevent these problems, Smart Village suggests a facilitating technology called the "drip irrigation" system. In drip irrigation, the farmers open a gash in the row that they plant their crop and install plumbing in the gash. The plumbing connects to the water tank where the farmer controls the water. The drip irrigation pipes sprawl out to the water and connected with the plumbing. In that way, farmers can control the amount of water that they use and adjust it according to the need of the crop.

Figure 7.8. Drip irrigation (groworganic.com 2018)

As the example above illustrates, compared to modern agriculture; the facilitating technologies require a new setup for the agricultural plant, which brings a discussion on whether it is necessary to invest in facilitating technologies. In one of my interviews, after having success with the drip irrigation system with melon, Osman Canatan was willing to try this system with the traditional product, cotton. However, before starting it without having enough know-how on how the drip irrigation system effects on cotton cultivation, he searched for other farmers who attempted to use drip irrigation in cotton. His aim was to measure the risks that he was planning to take. He shared what he thought after his research.

> I said to myself, "What am I doing?!". I'm good at melon, what am I doing? Let them do it (drip irrigation with cotton) instead of me...

Because he could not encounter any successful examples, he decided not to try this significant investment for almost no return. Instead, he prefers someone else to take the risk since he already profits with his existing investment on melon.

Kemal Türkoğlu emphasized his expectations for material gain to invest in drip irrigation in cotton production as in the following:

> Those who do (referring to people applying drip irrigation in cotton) are talking about 500 kilos. We already harvest 500 kilos under normal conditions (meaning the traditional irrigation method) without paying the expense of drip irrigation anyway. It is extra for me.

For him, the normal way of watering a land, the wild irrigation, does not require an investment. Yet, it has a decent and accustomed return. On the other hand, the drip irrigation system, which is extraordinary for the farmer, requires an additional investment. Therefore, the farmer abstains from invest in such a technology. In other words, he cannot risk his land unless the return is more than usual.

Another discussion on the expectation of return on investments is about the types of crops that Smart Village promotes with the facilitating technologies. Some crops being displayed in the Smart Village plots are crops that have a long-term return on investments such as fruit crops. Based on my interviews with agricultural engineers of the Smart Village, I noted that the cultivation of fruit seeds requires three years to become ready to be sold. Ahmet Dağdelen has described the risk they need to take as in the following:

> So, the man has 40-50 acres of land. He says, "If I plant a fruit garden or something else in my 40-50 acres land how can I pay my debts to the bank or Agricultural Credit Organization or someone else, how can I pay those debts?" Because if he made such an investment know, he cannot harvest any fruit in

the first year, or second year. He says, "My debts will raise exponentially!" That is the problem.

He mentioned the need for the financial capacity to reimburse the expenses of crops such as fruits. Also, because of the current debt systems, they cannot act freely on crops that will have a long-term return on their investments. Therefore, they focus on plants that will provide short term gain with low uncertainty. Resulting from that, they keep themselves apart from the crops promoted with the facilitating technologies in the Smart Village plot.

To increase the level of interaction between farmers and the facilitating technologies, Smart Village developed an Entrepreneurship Program for the women interested in new crop raising techniques by using facilitating technologies. I mention this topic in Section 4.5 in more detail. In that program, the women learn how to raise lettuce with facilitating technologies such as the drip irrigation system, humidity sensors, and soil temperature sensors (see Section 4.1) With that program, women and their families witness how they might use these technologies in their land and what type of return that they might gain for their investment. Ahmet Dağdelen also mentioned the new crop raising techniques that his wife has learned in this program and the implication of the method for their land.

> Now after the lettuce training, the method was used by those who learned. It is not that nobody used, a few people used it. And they made good money. But we don't have such a field in our land. To plant such a crop (lettuce) we must allocate 2 acres so that the crop will always be there in series so that my wife can constantly process that land. So that she can bring income to home. But now I have 10 acres. There we constantly plant cotton. We're not separating and acres from there. It does not serve our purpose. We think that we can get the cash that will come from lettuce from cotton anyway. We have 3-4 acres of place, but my wife grows already tomatoes and peppers in there. But she does not have much to do with greenhouse.

93

From his explanation, I understand that, even they have experienced in the Smart Village plots what type of return that the facilitating technologies bring with the crops such as lettuce and witnessed other people who tried the crops with the same techniques, it is not enough for them to plant these crops for a small piece of land. In fact, they still found trying this crop risky. If there is no additional gain that can be distinct from the crops that they are accustomed to, their tendency is mostly to remain with the familiar crops.

In the light of the discussions above, it is possible to say the farmers who participated in the interviews need for investment in new crop to use the facilitating technologies that the Smart Village offers. They explain the use of facilitating technologies as an extra payment for a crop that is not providing a more fruitful harvest. Their perspectives on deciding on a new crop can be summarized in four points; (1)New crops are carrying high risks, (2) new crops are bringing small return on their investments, (3) the farmers do not have enough space in their land to test the crops return and (4) the farmers do not have the financial capacity to compensate their investments. In the following section, I discuss the expectation of participants about guidance and crop maintenance from the Smart Village.

7.2.4. Guidance on Crop Selection and Maintenance

In the Smart Village plot, a wide range of crops that fits with the current climate and soil of the plain displayed. However, for the abovementioned reasons, the farmers in the plain are not taking into consideration those alternative options on the new crops. On the other hand, the Smart Village has not integrated its systems on the existing crops that the farmers are already benefiting. These differences cause conflicts between the Smart Village and the farmers. Kemal Türkoğlu criticized the Smart Village for not using the traditional products in their product line and not becoming an advisory authority for them in planting periods:

94

> The Smart Village is lacking one thing. Our plain is full of cotton, it is a cotton plain. Sixty-four thousand acres of Koçarlı plain is cotton. There is only one Smart Village, that is good and welcomed but sixty-four thousand cotton is planted in here, but they do not have any improvement cotton.

The lack of guidance in conventional crops leads him to criticize the services that Smart Village provides. He wanted to benefit from the Smart Village's presence for the traditional crops. This is also showing that the farmer sees the Smart Village as an organization that will guide them and improve their existing production. Another comment is from Kemal Türküoğlu;

> Smart Village can gather us, and we can go there. But what do I do with lettuce? I left the melon. I've drawn my way. The cotton is what I want. It does not necessarily be cotton. Seeds, fertilizers ... They should tell me "You do this wrong!", "You added too much nitrogen to the soil.", "Your soil is lacking phosphorus.", "That is what your land wants." They should tell me those things.

His explanations show that the resistance is not only limited to crop selection but also crop maintenance. The farmers are expecting guidance on how to protect and maintain their existing crops and their land. According to the explanation of these two farmers, I understand that they put Smart Village in a position that should provide agricultural knowledge and education.

7.2.5. Summary

In this section, I demonstrated the factors that affect the crop selection process of the farmers. I discuss the current context that affects farmers' decisions with the light of the services that Smart Village provides. I came up with four points that have a significant effect on farmers' choice of crops.

Firstly, due to the changes in the climate and the seed types farmers that I interviewed with tends to remain with the products that they can control the cultivation and

harvesting process. They also wanted to invest in products that have a certain return; even there is a changing climate or seed.

Second, my participants are benefiting the governmental incentives on special crop seeds. However, the crops in Smart Village is not in the scope of these incentives. Resulting from this, farmers that I interviewed with abstain from trying new crops that Smart Village displays since their investment is not protected and have a regular return from the governmental incentives.

Third, my participants are concerned with the return on their investments. They consider new crops as crops that need high investments and crops that do not provide a shorter return. They cannot tolerate this investment since they do not have enough financial capacity. They also do not have enough land to test the new crops and calculate the return of those crops. They tend to be risk aversive and focus on the short-term return. In the long run, this decreases their level of interaction with the Smart Village since they promote crops that are not common in their modern agriculture.

Finally, my participants seek for guidance on crop selection and maintenance process. They tend to see Smart Village as an organization that has the capacity to provide this guidance, especially on traditional products, and they criticize the organization for this purpose. In the following section, I discuss how the plant breeding plot as a strategic design intervention shapes the relationship between the Smart Village and the villagers.

7.3. Strategic Design Intervention II: Plant Breeding Plot

In this section, I discuss the system designed within the plant breeding plot that is positioned inside the Smart Village. I initiate my discussions with an overview of the plant breeding plot by indicating the goal of establishing the plot. After I analyze the factors that are decreasing the interaction of the villagers with the plant breeding plot, I continue to explain how plant breeding plot created a great demand for employment

among the villager. I also analyze the effects of employment to interact with facilitating technologies.

7.3.1. An Overview of Plant Breeding Plot

As I explain in Section 4.1, after the allocation of the land from the municipality, Smart Village transformed the 88 acres of the land for planting. Figure 4.9 illustrates the plant breeding plot and the Smart Village offices until the pastureland. This area consists of three types of plant breeding plot; The fruit breeding, the greenhouse, and the traditional agricultural plant breeding. Smart Village describes the aim of the plant production land to raise a wide range of products to illustrate the possibilities that the farmers can create with the help of facilitating technologies.

Figure 7.9. Smart Village offices and plant breeding plot

When anyone new arrives at the Smart Village plot, the first thing done by the Smart Village employers is to make a field trip in the plant breeding plot. In my first visit, the technology officer presented the plant breeding plot as a place to make the technologies more visible and accessible for the farmers. Also, he added, "Let the

villager come here; see here and watch what we do." During this trip, I also noted the following:

> The technology manager (Yetkin Kumruoğlu) explained that the aim of the plant breeding plot is to produce technologies easily accessible to farmers. He explains what he means by the world easily is producing a technology under farmer conditions (created for farmers context), as well. (Fieldnotes)

The Smart Village does not only breed plants and displays the facilitating technologies that are used in the plant breeding plot but also it uses the plant breeding plot as a laboratory. In other words, the technology developers have the opportunity to develop and test the technologies that they are breeding inside the plant breeding plot. The officer also added since the Smart Village plots are close to the center of the village, there is an opportunity to test the facilitating technologies with the villagers when needed.

7.3.2. Factors Prevent the Interaction of the Villagers with the Plant Breeding Plot

In this section I describe three factors that decreases the level of interaction between villager and the plant breeding plot. These factors are the communication problems between Smart Village and villagers, the mismatch between the crops produced in plant breeding plot and the traditional crops produced in the village and the physical space of the plant breeding plot.

7.3.2.1. Communication Problems

During my stay, I did not encounter any villager that is visited the village nor any technology that is tested outside the village area. I noted in my diary the following:

> An external visitor came to the greenhouse today. He was a bank manager. Urban people love it here. They're very curious. I haven't seen any villagers

visit since I arrived. Is it a coincidence? Only the kids come to play in the front yard. I always see the villagers in the pasture. (Fieldnotes)

Smart Village attracts people who are mostly unfamiliar with the village concept. People coming from cities or institutions are very curious about what is going on in Smart Village. On the other hand, the villagers are not interested in the plant breeding plot as the urban people. As I mention Section 4.1, during the setup of the Smart Village plot, founders of the Smart Village focused on the promotion of the Smart Village to the villagers, understand their know-how about the agricultural dynamics of the village and advertisement of the technologies that they would bring the Smart Village plot. In that period, the plant breeding plot was open for entrance around in the village and does not have any hedges. Alı Işık, the general manager of the Smart Village, has explained their interaction with the villagers during the setup process of the plant breeding plot as it follows:

> During the setup, curios people were asking. Everybody was asking us something. Because about 30-40 people were working continuously. The trucker was coming and says, "What are you doing here?". For example, he was doing earthmoving here, the trucker has his village, he goes there and tells people about us. This place was like the house of Someone's Watching Us. They read it in the papers. There was news on television and news on all national channels. But villagers outside our village started to be more interested than our villagers. People started coming.

As he explained, at the very beginning, the plant breeding plot was very interesting for the villagers. The curiosity of the villagers was causing them to ask a question about what is going on because of the significant transformation. Halime Esentürk from the Village explained in section 4.7.1 turning the land into a productive from a marsh to productive agricultural land was unexpected by the villagers. However, over time, this has changed. When the communication between the Smart Village and the villager increased, the problems between the two increased as well. Ali Işık explained

99

the communication problems and what type of action they took in response to these problems:

> There is a mass here, they want to work here and get insured. Yet their qualities did not fit with any job in our land. There is a second mass, even if they do not tell our face, they make fun of what we say, they resist to our work by saying "They cannot do this work.". A mass that is teasing, reacting, gossiping. Most importantly, this mass did not tell us how they feel but did they it behind us. And there is a final mass, trying to look cute to us by complaining about the second mass. Then we decided to do something. Because we could not manage the gossip and our great time was lost. We could not do our job right and could not distinguish what is correct or wrong. And this was turning us as a great time loss. There was always gossip, and we were trying to answer that. Such a bad situation occurred with no support and no resources. Then we decided. We said that we should surround the campus with hedges, let us not go outside this area. And as we do, they will see.

The action of hedging the plant breeding plot set a clear distinction between the Village and the Smart Village. The hedges were established as a solution to the communication problems with the villagers, to complete the other critical duties, which are crucial to continuing the operational activities. Ali Işık continued explaining the need for hedging the plot to deal with the communication problems and accomplish their duties:

> We are trying to keep our business plan properly with great effort. We have already signed international agreements. We have a lot of sponsors. We're trying to get the exact business plan we gave them.

His explanation shows that they establish a communication management process that depends on Smart Village's position towards the actors such as sponsors, villagers, international agreements. For example, Smart Village's responsibility to actors as sponsors is seemingly prior to other actors as villagers. The reason might be the need

100

for sponsors to continue to raise crops in the plant breeding plot, develop and test the technologies and make the land attract the visitors. He also mentioned the tight time schedule to complete their operational responsibilities. This tight schedule might cause a lack of developing a solution plan for communication problems with the villagers in a more extended time.

7.3.2.2. Mismatching Crops

When I asked my participants about how they perceive the plant breeding plot's system participant Kazım Tavukçu explained how he perceives the system of Smart Village in the plant breeding plot:

> Smart Village works in its system. Come my friend, I'm sitting here until the evening. Let us gather here. I expect them to say, "We have planted five acres or five decares of cotton, we have received 700 kilos. We advise you to do the same. We warn you before you do anything, let us help you.". There is no such thing. They work on their system. A not a soul come and say anything here. I must go there.

Similar to the findings on Section 4.2.4, Kazım Tavukçu's explanations show how he sees Smart Village as an organization that is expected to guide farmers about traditional crops. He reviews the plant breeding plot as a place to test and illustrate the productivity without he takes any risks. On the other hand, there is a certain difference between the crops that are produced in the plant breeding plot and in the fields of the Village. The difference between the crops produced in the plant production plot such as lettuce or melon and the crops produced in the villages own tradition such as cotton might lead him to consider Smart Village working in its own system; growing its own crops and serving only for itself rather than serving to the Village.

7.3.2.3. The Physical Space

Many participants from the village aware that they can enter the plant breeding plot to get information about the crops and facilitating technologies that Smart Village

displays. However, as I mentioned in section 4.3.1, I did not encounter any villager in plant breeding plot during my stay. When I asked the participants how and in what ways they visit the plant production plot, many of the participants responded that they enter the Smart Village generally when there is a training (see Section 4.6.). Their response shows that they interact with the plant production plot when there is an event that will improve their agricultural know-how and when there is an invitation. On the other hand, before deciding on hedging the plant, (see Section 4.3.1.), many people were visiting and showing their interest in the development in the plot. Therefore, it might be possible to argue that, closing the plot with hedges might be discouraging for some villagers to enter the land without there is an invite such as training.

In addition to the hedges, the position of the entrance door of the plant breeding plot might decrease the interaction between the Smart Village and the villagers. To enter the plant breeding plot, the villager should pass the main offices at first. In that process, the secretary welcomes you and asks your purpose of visit. It necessitates a forced interaction between the visitor and the Smart Village, which might be understood by some farmers that the place can be used only with the supervision of the Smart Village staff. I also in my field notes as follows:

> The other farmland in the village is not closed with hedges as the smart village. I can go to somebody's field and ask what they plant over there. Also, other fields are not in the center of the village like the smart village, they are little further outside in a different place. Smart Village has positioned closed to people's houses. Similarly, other villagers' houses are closed with hedges too. It might give the feeling that Smart Village is also a private property as the houses of the villagers. (Fieldnotes)

Both the hedges and the position of the entrance door might cause confusion in villagers' perspective, whether they enter someone's private property or to a place that is open to a broader community. In other words, physical space might connote a

different meaning than the desired goal of plant production plot that is to lead villagers to inspire and benefit from the technologies.

7.3.3. Employment

The size and product range of the plant breeding plot requires full-time employment to plant, grow, and maintain the plants. Smart Village focuses on planting the plot for each month without taking a break, which requires a well-organized system. The Agricultural Engineer, Figen Yüksek, explained how the current system works below;

> There are workers here special for every type of work. We just set out what to do, which program to follow, and who will do those things. We usually have weekly meetings. We talk about what we will do, what we will get from outside, and in what order the work will be followed in that meeting. Then I manage the workers and the tasks.

As the agricultural engineer of the Smart Village explained, the Village employs both field workers and managers to run the plant production process in the land. They have a vertical hierarchical organizational structure to manage their operations in the area. For the field workers, Smart Village tries to hire the workers from the Village. Only one worker comes from the neighboring Village; the rest is from the Village. Ali Işık explained what affected their choice of employment;

> The elected neighborhood representative asked for something (during the planning of the process). He asked, "You get staff from here, don't you? You get them from the Village?". We said, "Of course we get from the village. However, we want different profiles for different types of work. We take the people in those profiles from the village. We take those who are not in those profiles from surrounding villages.". This is already the natural texture of this work.

As the participants explained, during the setup of the plant production land, the Smart Village offered employment as a factor for negotiating with the Village. In one sense,

this negotiation allowed Smart Village to connect with the Village. Hüsnü Dağdelen, a field worker who has one of the essential positions in the Smart Village, who is also known as the kahya (the person who is responsible for a wide range of work in farms), explained how he was selected for his job.

> I was only farming back then. I'm still farming but I work here too. I have fifty acres of land right now. At that time there were 100 acres of land. He said, "Will you join us?" I say, "I agree.". I said," Although, I have high amounts of plots to take care," they said, "Wouldn't you then cut your responsibility in half?". I cut it in half. I had some rented land. I left them. I eliminated my responsibilities. They want me to bring farmers' ancient know how (traditional agricultural know-how) in their plots. As far as I know, they expect from me is the help.

His explanation shows that the Smart Village offers specific positions to some of the villagers that could bring unique know-how to the plant breeding plot. The employment opportunity that the Smart Village provides a desirable workplace for the kahya, which even encouraged him to leave his own plots. Every villager I have interviewed describes the Smart Village as a place that brings employment opportunities to the Village. Ahmet Dağdelen describes one of the essential features of the Smart Village as the following:

> There are 15-20 people from our village as employers of the Smart Village generating income from there. So, 15 to 20 households have a nice income. Because Smart Village is inside our Village, they do not pay for food and drink. They have monthly fees. They have insurance.

The plant breeding plot is perceived as a workplace for sustainable income. Smart Village distinguishes itself with its feature of employing people from the Village. This employment feature is attracting the villagers since it provides a regular monthly payment and security, which is different from what villagers are accustomed to. Salime Hakyemez, a field worker in plant breeding plot explained her previous works;

104

We always went to the Dayıbaşı, our job never has insurance. From Dayıbaşı you go to daily work. We don't have a field. My mom has land, but she rents it and we go to daily work outside. Tomatoes, cotton and actually what you see here (in the plant breeding plot) we were going to work. But we did not have insurance.

Dayıbaşı is a term used for the man who finds workers for a particular agricultural production. Every day, Dayıbaşı makes a call for the villagers and take them to their place for work. Dayıbaşı does not work in the field, but he gets the commission from every workers' fee. Going to work with Dayıbaşı means that the worker is paid on a daily basis. However, it does not guarantee the work for the next day. People who do not have land to plant, as in the participant's cases are used to work in the system of Dayıbaşı, which means a high uncertainty of work and income. For people who are accustomed to being paid on a daily basis, the plant breeding plot inside the Smart Village provides an alternative opportunity to get a fixed income. Salime Hakyemez explained her preferences to work in the plant breeding plot:

Normally I'm going to Dayıbaşı for daily work. I worked in İzmir Tukaş and worked in the tomato paste factory. I worked in the Forestry Operation Directorate. So, I worked. I was going to the mountains for anchoring. But we were entering those jobs from İşkur (Turkish Employment Agency). The jobs were for nine months, six months. But this place is continuous.

From her explanation, I understand that she tends to seek for a steady job. As she explained, in Turkey, the Turkish Employment Agency facilitates finding a job for villagers. However, the agency cannot guarantee a permanent position. Therefore, working in the plant breeding plot in the Smart Village seemingly appeals to some villagers. She also emphasized why her steady job in the Smart Village matters for her:

I did not have savings before I came here. I live in rent; I am married for 9 years. I do not have kids. I was pregnant but I suffered a miscarried and the

children died after 2 months. I had an operation. Anyway, I mean, I came here, my money was blessed. If I had 10 acres and 5 acres, I would do what I saw here.

She highlighted why her job matters by emphasizing the possibility of saving money. She indicated the uncertainties of her life by exemplifying her continuous debts such as rent. Therefore, she seeks for alternatives that will provide regular employment. Many villagers described the job is appealing because of this, similar to her reasons.

From setup negotiations to the establishment and operation processes of the plant for the breeding plot, employment became one of the most common ways of interacting with the villagers the Smart Village. However, this was not the goal of the founders of the plant breeding plot. Ali Işık reacted this much of an employment demand with frustration: Everyone's goal was to work here. And to get a money or a benefit from us. So, they didn't want to raise their lives.

As I explain in Section 4.3.1, the goal of the plant breeding plot is to develop a model where the villagers can witness smart agricultural technologies, apply what they have seen in the plant breeding plot in their land, and have a higher control of their agricultural production. On the other hand, providing employment might have an opposite effect on their goal. Instead of inspiring villagers to develop the capacity in their own plots, the plant breeding plot encourages villagers to work there for sustainable income and insurance. Ali Işık evaluates this approach of the villager's very opportunistic approach where the villager's consideration is mostly about the continuous financial return that the job can bring. This misperception him to develop a negative attitude towards the villagers.

As I discuss from both perspectives, there is a high disparity in the expectation of participants from the Smart Village and the participants from the Village. Crops displayed in the plant breeding plot involve high uncertainty, as I explained in Section 4.2. and is not perceived as an open area for their personal agricultural capacity

development (see section 4.3.1). The plant breeding plot becomes prominent with its feature of employment. Ali Işık told a story about this unmatching expectations:

> On March 8, 2016, Mrs. Yakın spoke with women. Over two hundred women participated in the village. They told Mrs. Yakın to hire us. They said to her, "Rent our fields and hire us!". Mrs.Yakın said, "No, I do not hire you, I will teach you entrepreneurship.". When we tell them, "You will earn your money by yourself." suddenly we see that all their dreams are destroyed. And they became enemies to us. Because they just wanted to get a job here. Mrs. Yakın said them that "I don't want to be the Hanımağa in here. So, if we tell them we will get you to the jobs in here, they will even give their fields to us. (dazedly)

The Villagers are accustomed to the concept of Ağa (Man)/Hanımağa (Women). Ağa/Hanımağa is the person who has the highest social and economic status in the village, owns the majority of the plant production land in a village. Because of the amount of plant, they manage the community. The villagers treat the founder of the Smart Village as if she represents the concept of the Hanımağa. They are ready to give up their land for an exchange of a job. This state of readiness to exchange their property for a job denotes the amount of risk that they regularly carry. Also, it illustrates how their traditional way of working for Ağa/Hanımağa links with working for a company.

7.3.3.1. Effects of Employment on the Interaction with the Technologies

Even though different views on employment created mismatch Smart Village and the villager, as a result of the employment, many villagers who work as a field worker had a chance to interact with the facilitating technologies that are presented and used in the plant breeding plot. In this section, I discuss the use of technologies from the employers of the plant breeding plot inside the plot and outside the plot and how it is affecting the villager's interaction with the technologies.

Use of Facilitating Technologies Inside the Plant Breeding Plot

Inside the plant breeding plot, I have interviewed with two field workers individually and three field workers as a group who have different roles in the plant breeding plot. When I asked the participants about how they perceive the facilitating technologies used in the plot they work, Dilşad Sucu, a field worker, mentioned how they used to work before the drip irrigation system:

> We had never seen drip irrigation, we used to carry water with shovels. We need to rush, like "Come on, run, run!" (when there is a problem). But ever since this drip irrigation system, you can detect the errors from the computer and take your precaution. It was very difficult for us to understand the problem previously. Go from one place to another and seek...

The participant emphasized the difficulties that they face in modern agriculture. She mentioned that her know-how and control over the land increased with the help of the drip irrigation system while the heavy bodily work decreased. However, she is not directly involved in the use of the systems. When I asked her how she analyzed the data received by the computers, she mentioned the following:

> We are workers, we do not understand the technologies. Mr. X (technology manager) or our engineers know those things. We only know how to read. But we can do everything else (meaning bodily work).

Even though she interacts with the technologies during her work in the plant breeding plot, she does not use the technologies in the plot directly. Instead of her, managers and engineers have the responsibility to use facilitating technologies. Also, from her explanation, I understood that she perceives her literacy level as if it will not be enough to use the facilitating technologies.

Use of Facilitating Technologies Outside the Plant Breeding Plot

My observations on the field lead me to another discussion, which is about how the current system that is implemented in the plant breeding plot by using the facilitating

technologies inspires the field workers to implement the technologies in their land. Almost every field worker has an area or a garden where they raise their crops. Ayşe Dağdelen explained what type of things that they started to do after they have seen in the Smart Village.

> We're planting melon with mulch. We do not have a vineyard or an orchard. We usually plant cotton, melons, tomatoes and so on. In the winter lettuce. So, we sell some products to others too. Since these technologies, melons are becoming more efficient because of mulch of course. The yield of the melon is much better.

Her explanation shows that she is encouraged to use the facilitating technologies that she saw in the plant breeding plot in her own lands. She also mentioned how the other villagers were affected by their use:

> My husband saw it here. We have planted 5 acres of melon. That year we received a very good yield. Those who heard from us also began to ask, "How much is drip irrigation?" "How can I do it?". After us, a few people started too, very few. But then there was no mulch, no mulching machine. Now it came here, the mulch machine. Anybody can get it from here. They (Smart Village) give the machine to anyone.

The family's eagerness to try the technology makes some other villagers curious about the technology. As I explained in Section 4.2, there is a tendency among the participants to witness the possible outcomes of a new technology before they use it in their own land. Although Smart Village uses those technologies and gets fruitful outcomes in the plant breeding plot, it might not be enough for the villagers who are not working for the Smart Village. When, the field workers like her implements the technologies in their land, it inspires other villagers to use the facilitating technologies. It is possible to say that the villagers have a higher tendency to get the knowledge and break their resistance to the technologies not with the Smart Village itself but with the field workers who are also their neighbors.

109

7.3.4. Summary

In this section, I started with a brief description of what is the goal of the plant breeding plot from the perspective of Smart Village which is to develop and test products that fit with the farmers' context while demonstrating smart technologies to farmers in the village. Later I indicated three factors that decrease the interaction between villagers and plant breeding plot. Firstly, I explained how Smart Village change its open model of the plot into a close model as a result of the communication problems. I illustrated the fact that closing the plant breeding plot as a response to the communication problems might be depending on the responsibilities to the actors that Smart Village has a prior responsibility to sustain their model. Second, I explained how the crops that Smart Village grows are different from the traditional crops of the village. The difference might lead some villagers to feel that the Smart Village only works for its system and not benefiting some farmers. Third I explained how the physical space of the plant production plot might create a perception that Smart Village is an inaccessible institution.

I continued how the plant breeding plot created a demand for employment within the village. Resulting from the employment opportunity created I analyze the mismatch in the expectations between the Smart Village and the villagers related with the plant breeding plot where the villagers wanted to be employed to work for the plot while Smart Village want the plot to encourage villagers to try the methodologies that they see in the plot to in their lands. Finally, I ended my discussions with how the employers of the plant breeding plot interact with the facilitating technologies. As villagers involved in the process of using the facilitating technologies, they can understand the benefits by comparing it with their past experiences while some use the technologies in their lands. The fact that villagers using the technologies in their lands encourages other villagers to use the facilitating technologies more than witnessing the plant breeding plot. In the next section, I explain the Smart Pasture as a facilitating technology.

7.4. Strategic Design Intervention III: The Smart Pasture

In this section, I analyze how the Smart Pasture -the new animal breeding technology implemented by the Smart Village- as a facilitating technology affects the villagers' relationship with animal breeding. I initiate my discussions on how the traditional pasture and Smart Pasture differ. I continue with the changes that the Smart Pasture brings to the villagers' life. Then I move on to what type of interaction the Smart Pasture creates between the villagers and the Smart Village.

7.4.1. Difference between the Traditional Animal Breeding and the Smart Pasture

During my research, I had a chance to observe and interview both the villagers and the Smart Village employers about how traditional animal breeding works in the Village. Conventional animal breeding in the Village mainly consists of two phases; priming and milking. The villagers who have bovine animals have daily work to prime and milk their animals. Especially when a villager owns a cow, they need to milk the cow in the morning and in the evening. The timing of milking the cow needs to be regular for the animal's well-being as well as the quality of the milk. The cows need to be fertilized in specific periods to give their milk regularly. The owner also needs to keep track of the cow's periods for impregnation. All the bovine animals, regardless of whether they are used for milk and meat, need to be primed daily both for the animal's well-being and to increase the quality of the animal product. In the winter period and dry summers, the animal is mostly fed with barley inside the barns in the villagers' houses. In spring and early summer, when the grass grows sufficiently for the consumption of the bovine animal, the animals go out the pastures. The pasture means the area full of grass and other plants for animals like cows to get their daily nutrition.

In the Village, there was no specific pasture area before the Smart Pasture was established. When the villagers want to feed their animals with the grass, they release their animals in areas that are not used by anyone. Therefore, in the Village, everybody

takes care of their animal individually when it comes to feeding them outside. I observed that women are the ones who are mainly responsible for the milking and priming of animals. They must be present in their barns to milk their animals on time. They sell their products to the milkman daily. Ahmet Dağdelen explained how this traditional animal breeding system in the villages affects their current lives.

> Farmers does not know how much milk they give. Usually, they are mostly giving it away. When you asked them "How much milk did you give yesterday?" they do not know. As a return of this milk, the milkman who buys their milk gives them some substitute products. When you asked them "For how much you got this substitute?" They do not know it either. It's up to the firm's morality to buy the milk from a consistent pay. Other than that, if the firm gives them the money, they take it, if not this is the regular process.

The villager explained that they lack information about the amount of milk that their animal gives that they and its' value. They sell their milk in exchange for fodder or similar products that are needed for their animals. Selling their milk to the milkman for fodder is not profitable since what they got in return does not have a monetary value; it only gives the owners the chance to feed their animal daily. In other words, the fodder can only maintain their system.

When the Smart Village came to the Village, they transformed an idle area up to 220 acres for establishing a Smart Pasture, which I explained in Section 4.4. They developed a smart milking unit to milk six cows at the same time in a sterile environment. The technology of the milking unit in the Smart Village as the employers put it "has a technology that creates a feeling for the cow as if her calf is milking" rather than a human is milking the cow. The technology officer of Smart Village, Yetkin Kumruoğlu, explained how the conventional system differs from the Smart Pasture as follows:

> Since the villagers delivered their milk as hot milk, the milk prices were very low. We bought the cooling tank in the Smart Pasture, the milk prices increased

by about ten percent and around twenty percent. This means you can make more money while getting the same amount of milk. In addition, because we use disinfectant, a completely clean and healthy milking occurs before and after milking. This is very important for animal health. While milking their animals we are sending in their phones a warning message against the risk of becoming sick, and at the same time to their vet. In this way, we have started a project in order to ensure that animals are constantly healthy.

His explanation shows that the system in the Smart Pasture solves the problems that the villagers face in traditional animal breeding. In addition to that, Smart Pasture includes additional benefits such as an increase in the know-how of the animal's wellbeing, sterile milking, and an active veterinarian system.

7.4.2. Changes in the Villagers' Life After the Smart Pasture

As I explained in Section 4.2, the villagers do not tend to take risks in their planting plots with new technologies and crops. The reason why they abstain from using these technologies was that they do not see any short-term return on their investments, or the return was not compensating their investments enough. As the opposite of this, the Smart Pasture provides a calculated short-term return when the villagers use the system.

Low Risk - Short Term Return

As I observed during my research in the Village, to use the Smart Pasture, villagers do not have to invest in anything. They do not need to pay for anything to use the system either. Hüsnü Dağdelen explained the following when I asked the question of how they decided to begin to use the system:

> One day someone came and said, "I want to give milk. I have five or six bovine animals. If your system (Smart Pasture) does not work, my milkman won't take my milk from me. We're already selling it cheap. So, what are we going to do?". Mr. x said, "If something like this will be necessary, I will sell your milk door to door or even I will continuously buy it from you.".

As he explained, the villager in this story only concerns about selling his product. Resulting from this concern, the founder of the Smart Village gave him a sales guarantee. He takes the risk for him and accepts full responsibility for this action. This type of promise has alleviated the liabilities of the villager. It also encourages a trust relationship between the Smart Village and the villager. In addition, this shows the purchasing power of the Smart Village. As a villager using the pasture, Ahmet Dağdelen explained what type of liabilities and risks that the traditional system involves:

> We were selling ahead at a much lower price. We sold it to the fodder man, we owe it to the fodder man. We were selling it to the market store, we owe it to the market store. So, we owe them money. Now we can use the money we received. They could sell us something at the price he wanted to. Now that (after the Smart Pasture) the farmer has made money, the number of animals has increased. Since we used our money well, the number of animals started to increase.

The participant described traditional animal breeding as a system that involves high risks. As he exemplified, being a part of the conventional system increases their debts and stuck them into a debt cycle. After the Smart Pasture, they are encouraged to increase the number of their animals since the system lowers their risk and guaranteed a return. In other words, they started to invest in animal production. Yahya Fidan, a participant from the village, mentioned the following:

> When the price of the cold milk is high and when everyone receives their monthly payments, everyone uses the Smart Pasture encouraged to do animal breeding.

According to the participant's explanation, I understand that farmers are not used to regular pay. (see Section 4.2. and 4.3.3 to read similar comments of some participants about lack of regular payment.) The regular payment provided by the Smart Pasture might create a perception in some villagers as if they have protection if they invest in

animal breeding. Ali Işık explained how the Smart Pasture promotes a profitable return system for the villagers:

> In animal breeding, the farmer's money comes instantly. Farmers are paid on the 24th of each month. In the traditional animal breeding, they received 1350 liras monthly, now it is about 1630 lira. It has about 20 cents per litter increase. Imagine your cow gives 50 litters a day, it means you got an additional 10 liras which returns you 300 liras extra per month.

From his explanation, I understand that it is essential for farmers to understand what type of return they get in a more countable way. It is important for them to get a regular return as well as measuring the quantitative results of the system by comparing it with the traditional animal breeding model.

Sense of Ownership

The Smart Pasture is designed as a service open for the frequent use of the community living in the Village. Even though the philosophy behind openness is similar to the plant breeding plot, the difference is that it is directly open for the use of the Villagers. During my observations, I have encountered with the villagers in the Smart Pasture area while they were bringing or taking back their cows. They were spending time next to the smart milking unit while their cows are milked by the machines. They were watching how the technology works and waiting for their cow's being ready to enter the Smart Pasture in the morning and go back home in the evening. I noted my diary in the following words:

> The smart milking unit seems to be independent of the Smart village land. Just outside the hedges surrounding plant breeding plot. Whoever wants can enter inside. The people working in the milking unit are already the youth of the village. There's no hierarchy here. There is no one saying, "Welcome, who you're not looking at?". There are benches in front of the milking unit. The women sit and wait for their cows. They are chatting with each other. Young

children are competing to get their cows to the milking unit before each other. Everyone seems so relaxed. This is like their place.

Spending time around Smart Pasture is seemingly okay and comfortable for the Villagers. Especially women sit and wait for their cow; they got a chance to communicate with each other and socialize. This comfort might be a result of the lack of hierarchy. From the workers in the Smart Pasture to the cows, everything seems to belong to the Village and the villagers. They do not see or interact with anyone as a higher authority from the Smart Village. It might be perceived by the villagers as an independent land from the Smart Village. It is viewed as if they own the property and the Smart Pasture system.

Higher control and know-how

After the Smart Pasture, not only the financial return of the farmer but also the know-how about the animal breeding and the control over the animal's wellbeing are increased. Technology officer, Yetkin Kumruoğlu what type of additional information they are getting from the facilitating technologies.

> First, farmers know how much money they make in one month. Second, they can observe the increases and decreases according to the fodders they give to their animal. For example, they can see the difference when they gave 10 litters of more fodder, as they receive 15-20 milliliters extra milk. These are examples. In this way, they adjust the rate of fodder according to his preference. Normally in large companies the fodders rations in grams very specifically, like how people have a nutritional calendar, they make this for the animals there. But the villager does not have such a habit, therefore Smart Pasture brings a solution to start this habit.

The facilitating technologies do not only profit the villager. It also helps them to make associations on what works best with their animal. They got the chance to compare how much return day gain daily and control their feeding habits in a more accurate way. Their control on how much profit increases when they follow the amount of

fodders their cow will eat. Ahmet Dağdelen explained what type of new information they got from the services by using the Smart Pasture system;

> Now we can make a better animal breeding. We know what the animal, the cattle, the cow, or the calf wants. And Smart Village put a pedometer on their feet. We can learn when we cannot yield, when animals have disease, when they have problems thanks to computers, thanks to technology.

One crucial information they get from the facilitating technologies is about tracking the productivity of their animals through pedometers. Ahmet Dağdelen stressed the fact that they do not have enough information about the productivity of their animal in the traditional system. Smart pasture is producing information about their animals' productivity and disease, which is meaningful for comparing to what they know about their animal in the traditional animal breeding system. A reason for this might because when villagers have more control over their animal, it reflects their financial gain directly. Yetkin Kumruoğlu explained another important information they get from the Smart Pasture system, how they receive and use this information:

> Information is sent directly from the computer to the phone. So, the computer sends that information to us automatically, which is beautiful. For example, the animal 2-3 periods, cannot get pregnant. At least we keep the pregnancy just in time, we can get her pregnant just in time. If the animal left empty for 3 months, it means that I cannot milk for 3 months and got any return out of that. The milking system is good. Also, there are cameras in the pasture. When there's a problem, we can watch it there.

The information that the pedometers produce is processed by the Smart Village into meaningful data for the villagers. Similar to the information above, this data contributes to the farmers' control over their animal and reflects their financial gain. Also, with the cameras inside the Smart Pasture, the villagers have more information about their animal's safety. Yetkin Kumruoğlu also added this situation with the following words:

In our work here, the farmer can compare the data with the previous day because all the SMS has sent them specifically including the millimeter and gram. At the end of the month, we give their hands a performance graph; related to animal feed, decrease and increase milk yield. They're checking them out. They control the performance graphics constantly by saying, "I gave you my cow this pill this week." "I gave a green barley this week." "So, when I put this fodder, the milk yield is increasing, the next month I will try that." and so on and so on.

The information provided by the Smart Pasture increases the independence of villagers with respect to increase in their knowhow. From the explanation of Yetkin Kumruoğlu, I understand that over time, villagers are tracking information by their self, without using the supervision of the Smart Village. In light of this, it might be possible to say that the more correlation they observe how facilitating technologies affect their daily return, the more autonomy they have on the use of facilitating technologies.

7.4.3. The expectation of Smart Village from the Villagers in the Smart Pasture

This encouragement of villagers to use the facilitating technologies in the Smart Pasture does not always cause a harmonious relationship between the villagers and the Smart Village. Ali Işık described what type of intervention that the villagers made after they wanted to use the Smart Pasture in their way.

We had alternate grazing. The alternating grazing is that we divided the 200-acre pasture into four. The cow started to go to graze in the deepest parcels. Three days later she would go to the other parcel, but she would not enter the place where she grazed 2 days ago. After four turns she will again enter the first area that she grazed. In the fourth turn, the grass will grow enough in the first area for her to eat again. This is called as alternating grazing; it is a literature term in agriculture. We split the areas with wires. But the villagers destroyed these wires. Because the grass in each area ends in a day or two. It's

running out. There's grass on the other three. Then the villagers did not stop, they destroy the wires in front of the cows and the cows have access to the other grass. When we objected, they said, "Why are you preventing our cows to eat grass, while there is grass over there?". Thus, all other grass was finished after twelve days.

This intervention of the villagers shows that their independence of using the facilitating technologies increased their sense of ownership in the Smart Pasture (see Section 4.3.2.). Even though the area is planned, tracked, and sustained by the Smart Village, the Villagers are feeling the right to use the pasture in their way. The differences in the expectations of these two actors from the Smart Pasture might cause conflicts among them. In other words, the scientific goal of the Smart Village focuses on the sustainability of the Smart Pasture while the villagers want their animals to benefit from the land as much as possible.

Although the villagers act freely in the Smart Pasture and have a strong sense of ownership in the land, their actions of them are perceived by the Smart Villagers employers as Ali Işık explained in the following:

I mean, we are re trying to help them this much, but... It's all free, we pay for the medicine ourselves, we pay for the staff ourselves, but the farmer doesn't even make a little sacrifice. For example, you say "Help me milking.", he says (a farmer) "I have a job!".

The description of the participant shows that as Smart Village members, they feel that the villagers perceive them as a service provider. On the other hand, the Smart Village compensates all the expenses in the land to support the villagers to use this system and let them get a meaningful financial return. Even though they describe the Smart Pasture as a supportive system for the villagers, it might be perceived as a pro bono service for the Village. Since Smart Village perceives the Smart Pasture as a support mechanism, Ali Işık expects the collaboration of the villagers in return. Ali Işık added the following words:

It is not profitable to run such a resort under one and a half tons. It is not possible that one and a half tons of milk will be available immediately. So, we need to make sure that people buy new animals now that it is a lot easier to take care of their animals. Therefore, we cover all costs. In other words, we cover the cleaning, medicine costs, training costs, water costs and milking costs of the system.

He explained what type of risks that they take for the economic empowerment and of the villagers. From the perspective of Smart Village, this system created with sacrifices. On the other hand, since they tolerate many expenses of the villagers, it might create the feeling that the village is providing this service. It might also be possible to say that; the sacrifices of the Smart Village might not be comprehensible since they face troubles of communication with the villagers.

7.4.4. Summary

In this section, I presented how the Smart Pasture as a facilitating technology is used in animal breeding compared with the traditional animal breeding. Smart Pasture is different from the current by increasing the know-how of the villagers about animal breeding, changes the quality of the product, and increases animal welfare. I continued the changes it brings to the villagers' life. I indicated three major changes; first, a regular increase in villagers' short-term financial gain, second, an increase in the sense of ownership a Smart Pasture system, third, a human improvement control over the animal breeding system. I finished my discussions with the expectation of Smart Village from the villagers while interacting with the Smart Pasture area. I illustrated that communication problems such as villager's resistance to the pasturage system might be caused due to the false positioning of the Smart Village in villagers' perspective; not as a supporting system to improve the villagers' conditions but as a free smart services provider. Next section I describe the entrepreneurship program established by the Smart Village as a Strategic Design Intervention.

7.5. Strategic Design Interventions IV: Entrepreneurship

In this section, I mention the entrepreneurship program that the Smart Village is established as a Strategic Design Intervention to increase the interaction between the women living in the Village with the facilitating technologies. I briefly describe what the aim and goal of the Entrepreneurship program is. I continue what type of attitude that the Villagers had towards the entrepreneurship program and what kind of intervention is caused by the result of the program.

7.5.1. Description of the Entrepreneurship Program

After one year of settlement, Smart Village started an entrepreneurship program, where women from the village who wanted to grow crops that would be provided by Smart Village sponsors inside the greenhouses in the plant breeding plot. The women were expected to raise the crops in 8 weeks in the greenhouses. Smart Village would allocate the greenhouses for the women during that period. The Smart Village experts would provide training to the women, which were designed to use the facilitating technologies and understand the data coming from the devices to intervene in the cultivation process when necessary. At the end of the program, when the harvest would be ready, the products would be sold, and the money received would be given to the women according to their production. The Smart Village would cover all the expenses of the program. In other words, the women would not have to pay for anything even if there they could not harvest their product.

7.5.1.1. The Aim of Entrepreneurship Program

The entrepreneurship program is created to encourage the villagers to experience facilitating technologies. The program targeted women because women are very active workers in the agricultural plant. According to my observations in the plant breeding plot, there is a distribution of labor between men and women. Women work in heavy bodily work, hoeing, harvesting, and planting while the men operate the machinery that needs to be used with the facilitating technologies. An example of this equipment is mulch machinery. Men use the mulch machine to lay the mulch on the

soil. While they open the gaps on the mulch for the plantation. The women, on the other hand, plant the crop physically. This situation leads man to expose to the technologies while it limits the women's interaction with the facilitating technologies. When I asked a group of women who are doing anchoring during my interview about how they feel about this situation, Süheyla Derviş responded as follows:

> We are pleased with our business. It sounds difficult but easy for what we do fondly. We are villager people, that is what we used to do. Every job has a challenge. We cannot act as officers after this time; everyone has quality. They can't do it here (in the plot), we can't do it there (in the office). Everyone has a mission.

The woman is accepting this situation since it fits with their traditional working culture. They used to become a part of this bodily work when they are working in their land or going to Dayıbaşı (see Section 4.3.3.) However, the lack of interaction between women and technologies creates difficulties among women to encourage themselves to use facilitating technologies (see Section 4.3.4.1.). Their accustomedness to this working environment might create the perception of using facilitating technologies additional. Another reason why they targeted women is explained to me by the former sociologist of the Smart Village, Bahar Algöz before they have established the program:

> The peasant is very patriarchal. They're a little off, not too open to listen to you. On the other hand, there is also solidarity among women. They usually live with their mother-in-law. But they mostly act with solidarity rather than mother-bride conflicts. Brides can share what they want with their mother-in-law and have them persuade their sons to do that. Therefore, we are trying to keep the woman in the foreground

The structure of the Village brings men to the first plan, but the women have a strong emphasis on men in decision making. Since the Smart Village is trying to establish a system that will change the traditional approach to agricultural production, they have

chosen the women as the leaders of change by considering the cultural dynamics in the Village. The entrepreneurship program presents technologies that minimize women's physical work, increase their control over the production process as well as increase the productivity of the harvest. They aim to encourage the women who would try the technologies in this program to implement the techniques in their plant so that the facilitating technologies will be used and spread around the Village.

7.5.1.2. Design of Entrepreneurship Program

The program consisted of two phases; theoretical and practical training. In the theoretical training, the women are trained by the experts about how and what type of interventions they should do for crop cultivation. In practical training, they got the chance to implement what they have seen in the class. Figen Yüksek, who was the assistant of the entrepreneurship program in that period explained to me how the system works;

> Women were given training two days a week. It was on Tuesday and Friday if I remember correctly. There was a 2-hour training in order not to bore too much. We were explaining disinfestation, procedures, fertilization. I was doing sample disinfestation, sample fertilization. For example, the teacher was teaching the irrigation system in the class while I was showing them how the irrigation system really is. The teacher was showing in the classroom with photos. Or, if we had to do, we were processing maintenance of the crops, or if the women should proceed weed control, we were doing it.

The program is designed with a concern of not to bore the women with too much theory. Therefore, the people created the program kept the number of days of the program short and the duration of the theoretical training quick. They were also attentive to exemplify the theoretical sessions in the working hours so that the women make real use out of it. She also described the responsibilities of the women:

123

Every day these greenhouses needed to be ventilated. In the winter season, for example, they have doors, so they had to intervene when it was freezing. They had to control the weed for a while.

Even though the program occurred inside the Smart Village plot, the women were responsible for everything inside their greenhouse. They were expected to individually act according to what they have seen in the training programs. In this section, I briefly describe the aim and design of the entrepreneurship program. In the next section, I discuss what type of attitude that the women of the Village have towards the entrepreneurship program.

7.5.2. Attitudes towards the Entrepreneurship Program

The Smart Village perceives the entrepreneurship program as an initial test for what they want to accomplish in the plant breeding plot, as I explained in Section 4.2. During my ethnography, I did not have the chance to observe the entrepreneurship program since it has been done in the winter period, six months before my ethnography (see Section 3.1.). However, I had an opportunity to interview with some program participants, their families, and the facilitators of the program. In my interviews, all the actors affected by the program described a confident attitude towards the entrepreneurship program, which is crucial for the feature interaction of the Village and the Smart Village. In this section, I will explain the general reflection towards the program design, attitudes towards the knowledge gained during the program, the rules of the program and the ownership of the products and place used in the program.

7.5.2.1. Reflection on the program design

Almost every participant of my interviews shared with me their reflections about the entrepreneurship program. I mainly selected the interviewees from the program participants and their families since they interacted both with the facilitating technologies, new crop raising techniques, and the system of the Smart Village. Ahmet Dağdelen, whose wife participated in the entrepreneurship program, shared his perception as follows:

10-12 women from the village grew lettuce there in the greenhouse. Their seeds, seedlings are paid by the Smart Village. They said, "If your lettuce is sold under a certain amount of money, we will arrange to buy them." The lettuces were sold a little over the price. And the ladies gained. From there, it was a good gain.

His explanations about the program have a focus on financial outcomes. He described the financial gain with the low risk that the Smart Village provided to them. As I explained in Section 4.4, using new techniques with low risk and guaranteed financial benefit is a general tendency of the villagers. I also asked the women who had participated in the program about their overall reflection about the program, Emine Fırıncılar explained the following:

We went there to grew lettuce. God bless them. I paid my debts with this money (money gained from the lettuce sale.) We raised lettuce; they gave us a greenhouse. There were meetings on Mondays and Fridays; guests were coming. They were phoning in a day and saying, "It is time for you to anchor your crop.", "The weed should be cut.", "We disinfect your greenhouse, you just walk in there and observe, don't touch anything!", "You just check the soil and fertilizers.". We have always looked at whether the insects have come to the root or damaged. They took care of it. We showed them (the soil); they did the pesticide. God bless them; we got our money.

She described the program as a chance to cover her debts initially. From her explanation, I understand that the Smart Village controlled all the cultivation process more than the women themselves. As she explained, she did not follow her lotuses conditions unless the Smart Village called and asked her. Also, Smart Village did tell them what to do and what not to do very sharply. From her description, the women have perceived the program as if they were in a position where the Smart Village was providing them a greenhouse service. Even though the program aimed to foster entrepreneurship, she did not mention her curiosity about the process or her

willingness to continue. Sakine Fırıncılar who participated in the program, described her experience as follows:

> In turns, they gave it (the greenhouses) to 10 people. They were drawing lots. Whichever greenhouse comes at you, they were yours. You were taking care of your greenhouses. Is there any grass? Trash? Is my lettuce damaged? Is my lettuce beautiful? You were looking at these.

She described the program by starting the random delegation of the greenhouses, where she felt that nothing directly belongs to them. She did not mention any facilitating technologies used in the greenhouses. She has only described the essential steps that she needed to follow during the cultivation process. I also want to add the fact that I conducted my interviews in the houses of my participants. I have observed that they only have a small garden and not a particular area for plantation. They mostly plant products for themselves or to sell it in the market. None of these two women used what they have seen in the Entrepreneurship Program in their gardens after the program completed. They do not use their space in the garden for the products as a lettuce sell in the market. I also interviewed with Fadime Uslu who participated in the program and planted lotus in her garden afterward. She is described her experience as it follows:

> I bought a children's room for my grandchildren with what I sold in the Smart Village with this money. God bless them. After that, I impressed by lettuce. The previous year I earn in the Smart Village. This year I earn by myself but less than last year, because the prices were low. It was very nice though. The lettuces were big, just 3-4 lettuces were filling a lettuce case.

She described the effects of the financial gain that she attains after the program initially. The tendency to cover debt or to buy a gift is showing that the participants might see the money as an unexpected additional gain where they do not invest in anything specific to agricultural purposes. Furthermore, she is very impressed by the facilitating technologies; however, when I visited her house, she stopped raising lotus

126

since she had troubles to sell. Similar to the other women, I visited; she also does not have spare land for plant production. However, she uses her area to apply what she has learned in the Smart Village. The position of her house is very close to the Smart Village, and she continuously interacted with the former agricultural engineer for the program. She has described her interaction with the Smart Village and the agricultural engineer as it follows:

> The teacher was telling us. We were going; we saw it alive. "That is the truth, it would be better if this pesticide is applied," they said. It went well there. Then there was Mr. Murat. Mr. Murat helped me a lot here. I called and asked, "Mr. Murat, how will this be, how will the drug be thrown?". I was saying, "I love the land, but technology is another." He was coming and helping me. That was good last year. My lettuce was good, but last year it didn't worth much because of the weather. When a person earns her labor, she is happier. It gets more fun; it gets more appetite.

Her explanation shows that the experts working in the Smart Village creates a channel between the villagers, technologies, and the Smart Village. Also, in my visit to her house, I have seen that she did not implement the facilitating technologies she saw in the greenhouses, such as humidity sensor or drip irrigation. She only applied the crop raising techniques that she lacks such as the use of pesticides or fertilizer. Resulting from that she could not control the quality of her harvest as it is controlled in the greenhouses, she could not sell it to a reasonable price, and she is discouraged from raising lettuce. Her situation might show that women could not capture the effects of facilitating technologies in planting lettuce. However, they understood the impact of the crop raising techniques such as the use of pesticides, fertilizers, watering which they already accustomed. This correlation illustrates that women might understand the concepts of productivity and innovation in agricultural production by correlating with what they were regularly doing in their lands. By that, they capture the differences and encourage them to use the new techniques in their lands.

7.5.2.2. Attitudes Towards the Knowledge Gain

Her explanation shows that the experts working in the Smart Village creates a channel between the villagers, technologies, and the Smart Village. Also, in my visit to her house, I have seen that she did not implement the facilitating technologies she saw in the greenhouses, such as humidity sensor or drip irrigation. She only applied the crop raising techniques that she lacks such as the use of pesticides or fertilizer. Resulting from that she could not control the quality of her harvest as it is controlled in the greenhouses, she could not sell it to a reasonable price, and she is discouraged from raising lettuce. Her situation might show that women could not capture the effects of facilitating technologies in planting lettuce. However, they understood the impact of the crop raising techniques such as the use of pesticides, fertilizers, watering which they already accustomed. This correlation illustrates that women might understand the concepts of productivity and innovation in agricultural production by correlating with what they were regularly doing in their lands. By that, they capture the differences and encourage them to use the new techniques in their lands.

> We learned the name of the fertilizer. The names are different in their language and different in ours. Their training is various; their fertilizers are different. That's how we learned. I couldn't use it in my garden. I have a vine tree and no place to do it.

She mentioned that she recognized the difference between the products she used in the cultivation process in the Smart Village and in her land. She explained the knowledge given by the Smart Village as if the understanding of "them" -Smart Village- and what she knew already as the knowledge of "us" -the Villagers-. This shows a clear distinction between what the women regularly implement in their lands and what is illustrated in the Entrepreneurship Program in the Smart Village. Even though she spotted this distinction of knowledge, she is not applying or using any of them in her land since she does not have a place to apply. As a result, the training

128

might not remain constant for her. Fadime Uslu mentioned an opposite experience with the knowledge she gained from the Entrepreneurship Program;

> Mr. Murat was talking to me. He said, "You're going to throw give these pesticides, they are useful." One day I just came and see there are whiteflies on my crops. He said, "These crops are ill; you need to give them the pesticide." He brought the pesticide; there was nothing left that, everything frozen — not even a fly. I've always followed what we saw there. I would disinfect the crops at this random hour. But they said that you could not disinfect during the day, only early in the morning or early in the evening.

Her tendency to remember and use the information she gained from the Entrepreneurship Program is mostly from the knowledge that is different than what she is regularly doing in crop raising. When she witnessed the transformation of the theoretical knowledge, she learned in Smart Village into the practice in her land, her tendency to use the techniques she learned is increased. Even though she has experienced and seen everything in the greenhouses during the program, the knowledge, she gained become more permanent when she has experienced the effects on her land. As she explained how the pesticide saves her product is illustrating the fact that the knowledge, she gained in the Entrepreneurship Program become more powerful when her product is under risk rather than the products that are given by the Smart Village. In other words, when she experienced the effects of the knowledge, she gained in the Entrepreneurship Program with her products in her land, her attitude towards her habitual behavior is changed, and her tendency to implement the new techniques is increased.

In so far as these two women' experiences show, the transfer of knowledge from the Smart Village experts to the Villagers were more likely to occur when the women had a chance to implement what they have learned in the field with their products. This also shows that the women do not own the products that they raised in the greenhouses that are allocated to them. I am going to discuss more detail about the unclearness of

ownership in Section 4.5.2.4. In the next section, I will mention the attitudes towards the rules of the Entrepreneurship Program from the perspectives of the Smart Village and the villagers.

7.5.2.3. Attitudes Towards the Rules

During the entrepreneurship program, Smart Village established some rules to increase the participation of the women to the program and support their interaction with the facilitating technologies. The most important rule of the program was participation in the lectures. The Agricultural Engineer, Figen Yüksek, explained the attitudes of the Villagers related to the rule of the involvement;

> We put something, absenteeism, just like in schools (to the contract). If a person would be absent, their greenhouse will be taken away from them. Most people came, but if I remember correctly, one or two people never came - eight days or eight class hours or so. We did not want to do anything. We did not take their greenhouse. We did not make a sanction. We said get earrings in your ears. We took a word for advice. We thought that only a negative approach could be taken.

As the Agricultural Engineer explained, there is no sanction applied when one did follow the program rules. This shows that there was an uncertainty about how the villagers will react as well as a certainty that the negative behavior will break the relationship between Smart Village and the Village. In other words, building strict rules could harm the communication they wanted to form inside the Village. On the other hand, the Ali Işık explained the situation of not imposing sanctions as follows:

> We put it in the contract; The farmer's greenhouse does not overlap twice. We will give the money based on their time spent in the greenhouse, and their greenhouse was taken away from their hands based on the contract. However, my employees working in our plot did not apply those rules. A woman came twice, and we didn't take her greenhouse away from her. Then I looked, only occurred 3 times to a program that needed to become eight times and get about

130

4000. We did the whole job by ourselves. However, who let it happen? The guys (employees) we got from this village.

Ali Işık explained the situation of not imposing sanctions as a thing that the employers did on purpose. The case for him is tolerating the unfair gain. This problem shows that there is an unclarity of the working system inside the Smart Village. The unclarity is apparent in the issues like imposing sanctions to their employers or the program participants. The attitudes of the employers from the village might cause the Smart Village to develop a prejudice towards the other villagers as well. Also, over tolerating the actions of the villagers might create a flexible and safe atmosphere between Smart Village and the Village; however, it is causing organizational problems inside Smart Village. Other troubles in the Entrepreneurship Program cause this unclarity explained by Figen Yüksek;

We were looking after their greenhouses anyway. They might think, "There is an Agricultural Engineer in our head, there are a lot of staff if anything happens already, they intervene, give fertilize, pesticide to the soil. We will also do our regular job, let's take our money." But that sounds like comfort. Because at the same time, they went here and went to the tangerine to get a daily wage. The money was coming from two places, and it seems to me to be comfortable.

She mentioned that the flexibility of the rules created a comfort area in the women where they have weakened their responsibility towards the program. She perceived the women as if they abused the Entrepreneurship Program; the women were still going to the Dayıbaşı (see Section 4.3.3.) for daily wage while they were supposed to work in the greenhouses. This attitude of the women shows that the women do not perceive the Entrepreneurship Program as permanent work for their future. Even though at the end of the program, they have generated an income more than the revenue generated from working for Dayıbaşı for two months, they still choose the short-term gain from Dayıbaşı instead. As a participant of the program, Sakine Fırıncılar explained in her own words her reasons to not participating the program

131

even though she got the money generated from the sales of the lettuce out of the greenhouses allocated for her as follows:

> You know, they tell you at the meeting when you were not present in the program. They said you did not show up the other day. They always taught me lessons like that. I could not go to three of the lectures. One was my daughter's birth, so I didn't go. I went to the tangerine for two days. So, what will the poor person do? We need money for our expenses. So, they said to me "We gave you this greenhouse, you're not interested, you're going to work or something." then I left, and I didn't go to the meeting days.

She explained that waiting for two months without getting anything return to cover her expenses of the period is not possible for her economic conditions. Resulting from this concern, she completely stops participating in the lectures in the program. She also did not mention positively about the fact that they were warning her for her absence. This is also another reason why the rules established by Smart Village is not demonstrating a clear system that by both actors welcomes. In the next chapter, I am going to discuss the unclearness of the sense of ownership that is developed during the Entrepreneurship Program.

7.5.2.4. Unclearness of the Ownership

In Section 4.5.2.2. I explained that the participant women did not tend to use the knowledge they learned in the entrepreneurship program unless they use it in their lands. This initiates a discussion of whether they perceived the crops inside the greenhouses allocated to them as their products or not. A story that Figen Yüksek told illustrates the women's perception;

> One day there was an extreme storm, too much. All the employees here, including the accounting, even we had a pregnant employee she also went out on the field so that the greenhouses would not fly. Everybody went out because the greenhouses were almost flying so that nothing happens to the greenhouses. But three of ten women have their houses right here, right on this

street. None of them came here on that stormy day. Did they not ask what is going on? They were their greenhouses. Of course, they are our greenhouse after all, but the products inside the greenhouses have belonged to them. They all had their names on the greenhouses. I became sad. Everyone was very upset. They could come or ask. Nobody asked anyone what we were doing.

Her explanation demonstrates that the women did not own the crops raised inside the greenhouses allocated for them even in a case where all the products were endangered, and eventually, their financial gain is threatened. She mentioned as the factors displaying ownership as the names written over the greenhouses. The inertia of the women is a clear demonstration that they feel like they did not lose anything if the crops would damage. It also demonstrates that they did not internalize the program as much as the Smart Village intended. This situation caused an apparent frustration in the employers of Smart Village. On the other hand, while the Figen Yüksek described the rules, they established during the practical sessions of the Entrepreneurship Program, she mentioned the following about the plant breeding plot;

There is a problem implementing security measures. "Nothing is going to happen to us. I have been disinfecting pesticides for 20 years. My life has been spent in the field, nothing happened." they say. So, there are still people in our employees who have this logic. It is not a problem for me, you may have been used pesticides for 50 years, but these are the rules here. And I will not let anything happen to you in my field. Anything can happen to you in your field, but I do not allow anything to happen to you in my field.

According to her, as a company, Smart Village needs to follow the rules and regulations inside the plant breeding plot. Her views illustrate the worker health and safety as an essential provision which could endanger all the system inside the company. Her explanation demonstrates that issues as such increase the control of the Smart Village employers over the women. Even in her description, there is a sharp distinction between "mine" and "theirs." This demonstrates that protecting the Smart

Village system caused high ownership of the land to the Smart Village employers. They were frustrated by the fact that the women did not come to save "their" plants when the storm occurs. However, their tendency towards the greenhouse is very possessive. This duality towards ownership creates a question of "who owns what?". Figen Yüksek explained another example which illustrates the misperception related to the ownership:

> The sensor, which is connected to the soil moisture, controls the soil moisture. There is a red line, and the soil needs to be watered when the sensor reaches the red line. Women saw all of this, but they never crossed it and watered their greenhouses. But when they came here, they knew they needed watering. When they came to class, they were asking, "This is getting closer to red, isn't it?". So, they had to go and check so that the watering can be done. After a while, they started asking, "When did you water this?". They never said, "I am here, I am going to go water my greenhouse.".

As she described, the participant women interacted with the facilitating technologies during the Entrepreneurship Program. However, there is certain inertia when it comes to acting for maintaining their crops in the greenhouses. Rather than taking care of their lotuses, the women were waiting for the employers of the Smart Village to act. The reason for the act of women might because the overcontrolling work of the Smart Village gives the women the confidence to leave these actions to the employers of the Smart Village. It might also create a perception that the Smart Village provided a crop maintenance service for them. This attitude of the villagers towards the Smart Village as a service provider can be read in sections 4.4.3 and 4.5.2 where the villagers might have similar perceptions on other facilitating technologies and strategic design interventions. Another example of the confusion in ownership described in the sentences of the Figen Yüksek as it follows:

> The young woman sitting right across the street had a sensor in her greenhouse. She kept staring at the sensors in her greenhouse. An old woman said, "Why

134

did you put the sensors in her greenhouse? You didn't put it in ours." The sensors were not in everyone's greenhouse. We were making such distribution. It is almost the same because you are getting current data anyway. Putting one sensor in each greenhouse is both not economical and unnecessary. It was not in her greenhouse because we choose her; it was because the place was suitable to take the average. Then the other women asked, "Why don't we have the sensors?".

The participant women seem that they cannot share the sensors provided to them. This approach of the women was indicating a strong possession of the censors, which leads a competition among the women since the sensors are providing a more productive cultivation process. Their contention between each other shows that women have owned the greenhouses and the equipment inside them; however, they did not fully take the responsibility to care about the whole process that the Entrepreneurship Program requires.

In this section, I analyze the different attitudes of Smart Village employers and Entrepreneurship Program participants, which mainly illustrated a disharmony between them. I discuss three reasons related to this disharmony (1) The current agricultural capacity of the women does not fit with what is illustrated in the program where the women cannot use the program outcomes in their further life. (2) There is a lack of elaboration of women's economic conditions that makes difficulties for women to participate in the program. (3) The program design creates an unclearness of ownership among both the participants and the facilitators of the program. In the next section, I will explain the interventions made for the following Entrepreneurship Program.

7.5.3. Interventions on the Entrepreneurship Program

In this section, I discuss what type of responses that Smart Village made after the end of the Entrepreneurship Program. As I explained above, Smart Village faced many difficulties and conflicts during the program. The discrepancy between the

participants and the creators of the program necessitated a review in program design. As a result of this, Smart Village planned their first intervention on the program. They controlled their reaction to the Villagers by not following the rules in the contract but perceiving the program as a test to understand this dynamic and keep the relationship stable with a strong carefulness on not expressing any negative behavior. Ali Işık explained their plans for interventions on the program design;

> We are trying to develop a suitable model not to fall into the same trap and not to have the same experience again. From now on, we will give the infrastructure on irrigation and fertilizer. We will provide them with the seeds, fertilizers. But we plan to co-produce with them. We expect them to earn an income above their salary. We also offered a model for the Ministry of Agriculture to accept. We're going to make them insured, but then we're going to deduct it after they receive their money. Secondly, we will pay them a certain money. So, they don't wait for the end of the month. They are having trouble breathing. We will follow a path like that.

His explanation underlines the need for intervention as protection of themselves from the villagers' previous attitudes and the governmental rules and regulations. To find a middle way between their aim and the conditions of the villagers, he mentioned an important topic that I have covered in section 4.3.2. They plan to build the next program by concerning the financial circumstances of the Villagers. By providing regular income with short term periods and providing a social security system Smart Village describes the next program less top-down as the previous program which does not fit with the real-life conditions of the villagers but more with a Villager centering focus. On the other hand, Figen Yüksek described her point of view about the intervention on the Entrepreneurship Program differently;

> We will reduce the trouble to zero. For example, there will be an article like the following in the contract, "All disinfection and fertilization should be done just in time with the supervision of the Agricultural Engineer.". So, I will tell

them what to do. I will check it out and make sure it is not late. They will follow what I said. Of course, they are free to express their opinions. We have never wanted to hinder their ideas.

Even though the planned new system paying attention to focusing on the condition of the villagers, it also gives importance to be taken by the villagers more seriously. Especially when it comes to protecting the Smart Village plot and safe application of the scientific agricultural know-how. In that way, Smart Village might want to intervene in the act of participation in a more controllable manner. On the other hand, the fact that she emphasized their freedom to express their opinions creates the feeling that there is a concern that the villagers might resist their new system. She also mentioned the importance of the rules as such as follows:

If, for example, the disinfection is not done on time, the contract will be terminated. If necessary, we will continue according to the terms of the agreement. We want it to be a little harder, not like before, because if we make a mutual agreement, everyone must follow the requirements. Just as we have obligations, the villagers must know their responsibilities. We will do everything before we start. Everything will be executed that way. For example, we will say, "If you accept this, let's make this agreement, these are the criminal terms, and your contract will be terminated as follows.". There is nothing definite right now; this is an example. But there will be something like that.

Her emphasis on having rigid rules followed by as strict actions is again illustrating the need of controlling the behaviors of the villagers. Her explanation shows that people having more presence in the facilitation of the program might be willing to display acts of a higher authority when it comes to controlling their interaction with the villagers. They might see the implementation of their systems superior to the current situation of the villager. This might not directly contribute to the solution of their problem with villagers but to set clarifications for attitudes towards the program.

Different interpretations of different actors from Smart Village shows that defining the intervention of the program depends on the level of interaction in the facilitating process. In other words, even though the general manager's overall tendency is to build a more villager-oriented program, the agricultural engineer puts program rules on the foreground to run the facilitation process safer.

7.5.4. Summary

In this section, I presented the aim and the design of the Entrepreneurship Program briefly. I continued with the different attitudes towards the program and the interventions planning to be made for the next program. For the participants form the Smart Village, the program was not meeting with their expectation such as high involvement of the women, inspiring women for entrepreneurship. From the participant's perspective, the program contributed to their economic wealth, but they might not apply any learnings came out of the program since they do not have the space and time. This shows that, the conditions and needs of different actors and different level of interaction of the actors with the program are two important factors to define what type of impact the program will have on the Village. In the next section, I describe the training as another strategic design intervention.

7.6. Strategic Design Interventions V: Trainings

This section, I will mention the trainings that the Smart Village is providing to the farmers as a Strategic design intervention. I initiate my discussions briefly on the description of training. I move on with the factors affecting training design. Finally, I mention how the Villagers got affected by the training.

7.6.1. Description of Trainings

Trainings are one of the critical interventions of the Smart Village, which increases their interaction with the Villagers as well as the farmers from different villages. By providing trainings on the subjects like productivity in animal breeding, technology-supported vegetable production or correct agricultural fumigation methods, they want

to increase the technical know-how and increase farmers' control in animal breeding and plant production. It is also a powerful medium for the Smart Village to present their concept, introduce new systems to the Villagers as well as increase the recognition of the Smart Village among the farmers. The office area is designed accordingly to the trainings where a conference room and classrooms are available specials for different kinds of trainings.

Until the period when I conducted my ethnography, up to 3000 farmers have received trainings according to the records of the Smart Village that they have shared with me. (see Section 3.1.) During my visit, I did not encounter any training. According to the participants from Smart Village, the reasons for that was since the period was an active plantation and harvesting period. Where also previous programs such as the entrepreneurship program and former training programs were in the review process by the founders while they were programming the next winter season. Therefore, I only spoke with my participants about the previous training programs. Ali Işık explained the program planning process as follows:

> First, we will do a design study, and we will cover all aspects of the trainings. Then we plan to provide training. We did the same last time. We did. We invited 100 people for training. Twenty-five people arrived. Ten of them continued, last time. We are going to do something similar. This time we will give priority to education. We will get their ideas this time. The most important thing is to get their opinions.

He mentioned the period of planning the trainings as a reflection of their past learnings. He put attention over their learnings related to the villagers. The fact about caring about the villagers by receiving their ideas when creating their training contents included a more hopeful expectation of participation. On the other hand, putting more emphasis on education is essential for the involvement of many villagers at a time. He explained what they aim with the trainings;

We will follow the people we train, look at the change there. That was our previous goal, but we couldn't do much. We do it in close areas for small groups. For example, there are trainings about this milking system and livestock. Veterinarians. Mr. Rahmi, for instance, we take the outputs of the trainings that we provide, such as milk efficiency and their satisfaction. They buy new animals; things get more comfortable. And we are recording, but we have not yet received the changes in the results of the trainings we have given to other larger groups.

The primary purpose of the trainings is to create changes in the lives of farmers. This purpose indirectly supports Smart Village's goal of increasing the productivity of agricultural production by bringing together farmers with technology. The fact that they follow the short-term impact of the trainings and give importance to them is supporting this argument. According to his explanation, developing a long-term change-oriented approach during the implementation of their model will increase the tendency of villagers to adapt to the Smart Village model. In other words, a plan for creating a change in villagers' lives will improve villagers' relations with the Smart Village system. Next section I am going to describe factors affecting the curriculum design of the trainings.

7.6.2. Factors Affecting the Training Design

One of the most important factors effects the design of the trainings is the target trainees. When I asked Ali Işık about how they reach the participants of the training programs he explained as follows:

Let's say we reach the Municipality of Nazilli. We speak to the Municipality of Nazilli. We say, "We can give trainings like this.". The municipality also says, "Our farmers in our mountain region produce organic olives, but they cannot market these olives." Then they're coming. So now we have reached, we introduced ourselves. They also know the problem in their region already. They bring the farmers there to us. Then we give training here primarily on the

140

yield of olives. Then they asked, "How can it be marketed? ". We are telling them. It is an awareness that does not occur in one day, so does the magic wand, first awareness-raising rather than the education.

His explanation shows that collaborations with actors as higher authorities have an essential role in reaching the farmers. These collaborations are not only crucial to reach the audience but also analyze the needs of a group of farmers. When I asked about how does the villagers current expectations effects the content of the trainings, Ali Işık explained the following:

> They are not in open communication. Our work is easy if they are open to communicating. We try to figure out what we supposed to understand. So, we need something like a two-layer decoder. They say something about their needs, but is it true? They refer to what they want to say. The real information bounces from what they want to say exactly and triggers something else in them. We cannot solve this.

The description expresses complexity in communication. From his explanation I understand that Smart Village faces with a challenge to understand villagers' expectation on trainings. The decoder example shows that they have troubles to interpret the lifestyle, desires, and demands of the villagers. His also stated the following:

> We ask them what they want to know. It may not be the same as what they want to learn with what they asked. Then you know their geography, which is one of our strong muscles. For example, we are a company that understands the hidden potential of all regions in Turkey's geography instance is not very common in every part, but we know that boarding houses or canning may be beneficial in that region. That could be geothermal, greenhouse, something can be done with spa waters. Anything with the region's potential strengths.

His statement stresses a solution to communication difficulties between the villagers and the Smart Village as their capability of predicting their likely needs regionally.

141

Designing trainings by taking consideration of the regional needs creates a foresight about what villagers need, but it might also promote a generalist approach. In this way, training might only provide the villagers with information on regional potentials rather than their direct needs. His explanation also shows that Smart Village put themselves in a position less like a trainer but more of a consultant for agricultural investments. From one sight, this position might enrich the relationship between villagers and Smart Village while it might lower their focus on the subject. He continued to explain the profile of the farmers participating in the trainings:

> We are trying to provide training on drip irrigation, but a farmer says it will not be possible. As he closes himself, it is getting harder. If you can allow him to open an artesian in that area, he can go in a different direction. If you can show him how he can do it, he can. In other words, the people who came here to receive training have already tried all the ways about their subjects and asked questions, and if they are desperate, they come here, now we are looking to training a little bit like that.

The content of the trainings is related to the real-life situation of the villagers. Their openness to trainings is mostly related to what they could implement in their fields. Also, when the villagers are too much of a need for help, they are more likely to learn about the content of the trainings. Similarly, to the arguments in Section 4.5.2. when the villagers can apply the learnings on their fields to decrease their own risks, they are more likely to interact with the Smart village. The participant also added the importance of the self-will in participation as follows:

> There's something about the ones who decided to come here. We do not give fuel money to those who come here; it's essential. It is a breakpoint. We do not afford the arrival or accommodation. We only offer small refreshments, tea, and water. The reason for this is, for example, agricultural fairs pay for the buses, diesel and travel money to pay for the people. Usually, people who do not work in the village says, "Let's go and see, we are not paying anything out

142

of our pocket anyway.". People coming here in a way pays something even if 10 liras, 20 liras, this is an investment. This is a crucial learning decision.

Not having a reward system on the training program is guaranteeing the willingness of the program participants for them. They are protecting themselves from the people who might abuse the program at the same time targeting the people who are investing their time and a small amount of transportation money to learn something will create a stronger interaction chance. This is showing the Smart Village's criteria for the participants of trainings. In short, understanding the needs of the farmers is essential for the design of the program, yet understanding it not entirely possible unless directly experiencing the difficulties that the villagers are facing. Next chapter I am going to mention the perception of the villagers about the trainings.

7.6.3. Perception of the Villagers about the Trainings

During my ethnography, I have interviewed villagers about their overall experience of the trainings. As the above explanation of the founder illustrates, not many of the individual farmers participated in the training programs. However, almost every Villager who is using the Smart Pastureland involved in the trainings on animal breeding, which help them use the Smart Pasture system (see Section 4.4). Kerim Çorapsız who has attended both trainings about animal breeding and plant production is explained his experiences on the trainings;

> I mean, then, everybody was thinking "I know," "what's missing?", but there we saw what is missing thanks to those trainings. In the beginning, we were saying, "What do we need those parameters?". We now learn that such a thing was needed; for example, some animals did not show any signs in animals such as heat. And that's a significant benefit for us. In farming, for example, we learned that harping water is not right, too much nitrate makes the soil nitrate, so it would not give much of a product. We cannot learn those. I mean, these are all things that generally came out of our pockets. We were able to learn

143

them. In other words, we were able to learn that there was something we could give to the soil more than money, thanks to their lessons.

He defined his prejudice of his fellow villagers' resistance initially. This resistance is showing an early lack of trust to the necessity of the tradition. However, after they have participated to several trainings, he has described the benefits of the trainings by comparing the money he spends on plant production or animal husbandry with the money he spent on the same things based on his previous knowledge. In other words, decreasing their expenses after the trainings attract him at most. The clarity of the result, especially in monetary terms is significant for the villagers' participation in trainings. Hüsnü Dağdelen covered a critical fact as follows:

> There was very high participation of 30-40 people when giving livestock classes. It fell slowly towards the end. There's got to be something to encourage the farmers. I said with the district governor., such issuing institution, let's give the people doing animal breeding a certificate. I said that our policies are going towards this. Conscious breeding with a certificate. Let's take it; maybe the state will give the animal. At that time, these projects are new; the intention was received by the ones who are certified first. We look forward to everyone attending so.

His explanation shows a need for the approval of a higher authority in case of a reward, as I explained in Section 4.2.2, participant villagers have an accustomedness to the governmental incentive system which provides them a guaranteed return on their agricultural investments. By considering the learnings of the trainings as an agricultural investment, an authorized certificate represents for the villager a possibility of a safeguarded return. According to the participant that kind of a return system might foster the participation and clarify the reasons for involvement for the villager.

7.6.4. Summary

In this section, I discussed the training program as one of the strategic design interventions of the Smart Village to increase the villager's interaction with the Smart Village model. I explained the overall description of the training program, which has the focus to cover the needs of the villagers and increase the interaction of Smart Village and their target audience. The villagers are seeking for a tangible and monetary outcome of the training, which will return them as saving or solving their severe problems in the field. However, the unclearness of the needs of the villagers from the perspective of the Smart Villager employers and founders shows that there is a communication barrier among the actor. Collaborating actors as public authorizes plays an essential role in overcoming the obstacles and attract more villagers to trainings. In the next section, I am going to discuss the social and cultural activates pursued by the Smart Village as another strategic design intervention.

7.7. Strategic Design Interventions VI: Social and Cultural Activities

Starting from the planning process of the Smart Village model, the Smart Village works initially on establishing a close relationship with the villagers by fulfilling their social and cultural needs. The founders described this approach as a chance to increase their social cohesion with the villagers and letting the villagers internalize their model by being a part of it. In the planning phase of the Smart Village model, to determine the priority of the social and cultural activities, Ali Işık mentioned in his early discussions with the elected neighborhood representative as follows:

> First, the elected neighborhood representative asked for a football field, a playground, and a wedding hall, because it was his election promises. Since the project will be with children and young people, we would add a sports facility to our project. We had an area in the plan for fields to play volleyball, basketball, and football for employees. We said we could use this area with children and villagers. So, we accepted him.

The fact that the elected neighborhood representative made individual requests from Smart Village symbolizes that the relationship they try to establish is a negotiation process (see Section 4.3.3.).The explanation of the founder illustrated that the elected neighborhood representative went through a bargaining process with Smart Village to maintain his position in the Village and his relationship with the villagers. Resulting from this, I understood that social and cultural activities were born as a negotiation of the common expediencies of different actors. In my interview with the elected neighborhood representative, he also explained this process as follows:

> What I said in my election declaration, it was similar to what they say, almost the same, for example, the wedding hall for the village, the football, basketball and volleyball court ... I told the villagers that l would build those. I said, "It was a blessing for me." They said, "We will get it done, but we can't promise it all." Even if it is not the same, it will become a center of attraction. People will come from outside. Of course, the municipality is not a fool, as people come here, they will improve the roads of the Village. After that, they will value a little more here. They are going to do more, so I said okay, considering that. Then I said, "So I talk to the villagers. We will try to convince them together. I hope nothing will go wrong.". That is how we talked. Then they started the project.

The explanation of the elected neighborhood representative also confirms a negotiation process based on mutual compromises between the Smart Village and the elected neighborhood representative. The overlapping of the elected neighborhood representative's election promises, and the social and cultural activity plans of the Smart Village fosters to gain direct support from the person who had a significant impact on the villagers. His explanations also show that both actors had a concern about the villagers who might oppose the Smart Village model. To cover up this concern, the cooperation and unity of interest of these actors might have a significant impact against the resistance of the villagers.

7.7.1. Social and Cultural Activities with Children

After the above mention negotiation is held, the activities are started in the Village. At that time, the Smart Village plot was not established, so the Smart Village members were working in another office for the planning phase of their project, as I mentioned in Section 4.1. During this process, the first activity planned by the Smart Village was regarding the children. They have employed a child development teacher from the Village, Halime Esentürk. I interviewed with her, and she explained to me the activities as it follows:

> Mr. Işık said, "At first I will give priority to children. I will help the children's lessons. Can you take care of the children?". When the summer comes, everyone's parents are in the fields, and the child is empty. They must be trained. They are studying at school, but there is slack during the summer break. Their behaviors are incomplete. There is no social activity here; then they go to the field. I agreed, so I started with the kid's club at first.

Her explanation shows that the Smart Village targeted the families at first by providing a service for their children. The children club was fitting into a gap, which is a significant need of the children. It is also used as a channel to reach the families and eventually to the Village. To attract the families, the participant explained the following:

> I went to the families one by one before we opened the club. "Look, I'm a child of this village. There is such a thing for the children of our village. I will help their lessons; I will take care of them while you are in the field, you do not need to be worried.", by saying those I visited our Village one by one. Afterward, about 30 students arrived. Participation was very high. Some were working in the fields to help his family. Sometimes the number was 20.

Her explanation shows that emphasizing the fact of being a citizen from the Village is aimed to build a trust relationship. As the discussions on the concern related to getting the acceptance of the Villagers illustrates, I interpret this as a tactic to make a genuine

relationship with the Villagers. Also, the absence of some children underlies an important cultural habit of children helping their families in the summertime. This change in the children life is indeed a contradictory case for the Villagers; however, their perception change over time is explained by Halime Esentürk:

> In the evenings, the children were telling families what we have done in the club, and there was a curiosity in the families. I printed out what I said in class. Such a child came up and said: "My mother is very curious.". I printed out written and said, "Show it to your mother, let her read at home, she can come if she wanted. I can tell her.". Before that, the child was always going to the field. In time, "You go on, we will handle it." family began to say. They didn't send their child to the field.

The communication established with the children over time encouraged the families to welcome their children's participation in the children club. Creating opportunities for children to socialize in their age group is not only affected children's integration with the Smart Village but also changed how the families perceiving their children. In summer, families tend to perceive their children as helping a member of the family in the field. Rather than considering their children as a helping member in the field, the reflections of the time spent in the children's club encourage the family to look at the socialization of their child positively. Instead of having additional labor in their field, the families respond to the socialization of the children with his peers positively. This perception change creates a likely hood of attitude change in the family, which is resulting in sending their children to the children's club. This type of change has a supporting effect on the other attitudes changes that the Smart Village wants to create in the long term, such as changing in agricultural production habits or an increase in the use of technology.

When I asked about how she was deciding the content of the activities in the children's club, she answered the following:

148

I wanted to put the Smart Village in the children's brains. That was my goal. Let the youth learn. I have the children write poems about the Smart Village. I was telling the topic of agricultural technology, etc. By teaching things like "your family will work here, money will come to your houses from this place, this place will improve you socially with social activities, also this place is the first in the world and Turkey. " then I was saying, "Let's write an essay describing what we have learned.". Whatever I transferred to their brains; they understood this information. There was a tablet award to the author of the best composition contest. It was very influential in composition and poetry.

The focus behind the social and cultural activities was to engage children with the Smart Village model. As she stated, her goal was to increase knowledge on the future image of the Smart Village. Events as competitions show that children are engaged in learning through the activities in the children's club through a tangible reward system. Her emphasis on framing the Smart Village as a place for "earning their future income" and put forward the employment opportunities in the Smart Village illustrates that the children club targets not only the children but also their families.

After the Smart Village plot established, the children's club is moved from the city center to inside of the campus of the Smart Village plot. They provided a variety of workshops and classes to children from coding to the theatre. However, when I was doing my ethnography, the children's club was closed. The participant above mentioned the reason for that as a process of learning and preparation for a new system. Ali Işık explained the whole process of closing the club by addressing the conflicts they have seen;

We did things like reading books for children, theatre, and robot workshop. But here is something like, for example, after school, we have provided lesson support programs. But the families saw us as if we were obliged to take care of those children. They sent their naughty children to us not to take care of them in their own homes. So even though we do not charge them for any

149

expenses; they did not have to pay for any cardboard, paper or pen; they thought that we would do it compulsorily. And then they mistreated us. "Why aren't you interested in my child?" or something. Families came upon us when we wanted to separate children from campus, especially when they were naughty. We want to separate children who wished to study appropriately and too disobedient children, or children who did not follow the rules. That is when we shut down that system. In other words, they thought it was a work that we had to do. As we moved further with the club, they felt we had to do it and came upon us, misbehaved, did not support, and became shackled.

The way families evaluate the children's club as a compelling service of the Smart Village even though they have established the area voluntarily. The conflicts raise might because of the lack of capacity of the Smart Village to comprehensive services to children with different profiles. As a response to the conflicts, closing the children's club might damage the relationship that Smart Village established with the villagers. In the following section, I will analyze other social and cultural activities.

7.7.2. Other Social and Cultural Activities

There have been many other activities that target not only the children but also other villagers as it was promised before the establishment of the Smart Village. The opportunity that the Smart Village is generated regarding the socialization of the villagers carries an important role. Halime Esentürk described before the setup how she perceived the Smart Village she explained the following:

This was an empty land before; people used to graze here. I don't know how much grass was here, but there were herbs, and people were using here as dumps. It was an empty space. Nobody thought of it. Everyone would say, "It is very hot if we take our seeds and sit in a tea garden to cool down. ". Everyone was sitting in the garden, wanted to change. Here they were going to the park, especially in summer. They were working in the fields, working in hoe, melon, watermelon. For them drinking tea and going to the district to eat ice cream

meant social life. It was a difference for them. If in Smart Village, we can have a social activity it will be great for the people. They are still asking me, "When will you open that farm shop? (a place inside the Smart Village similar to a tea garden.) When is it going to be public? We want to go sit down and eat ice cream there. ".

She has explained the need of the Villagers for a place inside the Village to socialize. Many people were excited about the transformation of the Smart Village plot as an opportunity for them to socialize within the village. They kept asking about how they could benefit from this socializing benefit that the Smart Village promised to be provided. In one level, this curiosity of the families is showing that positioning the Smart Village as a social activity provider is increasing the willingness of the Villagers to interact with Smart Village. They are likely to perceive Smart Village as an actor who is fulfilling their needs. From one level this is creating a desired outcome for the Smart Village, from another, it is explained by Ali Işık.

For example, we wanted to make a summer cinema. In the evening, but we were thinking about how we watch it if anything happens in that movie, for example, a politic discourse. What is going to happen to us? This village is a Turkey average. It is an average village. So, for example, there might be people kissing in the movie; then people from the village might walk up to us by saying that their kids are demoralized. Such as these things have harassed me.

Over time the expectation of the villagers covered by the Smart Village is reached to the point that becomes hard to control and ended up by withdrawing the social and cultural activities they provided. The conflicts raised due to the mismatch of the demands among the actors. Challenging with those conflicts seemed to harm the relationship of these actors. The reason that Smart Village abstains from pursuing activities seems because of the cultural differences. This abstention might another sign that the events were not coherent enough about the cultural expectations of the villagers.

7.7.3. Summary

In this section, I mentioned how the Smart Village use their ability to provide social and cultural activities for the villagers as a strategic design intervention to increase the familiarity of the villagers with the Smart Village model. In the beginning, I demonstrate how these activities are used as a bridge to persuade the villagers about the feature existence of the Smart Village. I mentioned the persuasion hierarchy in the village where actors as elected neighborhood representatives agreed on several negotiations with the Smart Village though the construction of social and cultural activities. Later, I explained the activities provided to children and adults. The discussions are illustrating that the social and cultural events offer a reasonable extent for the Smart Village to foster the attitude change that is presented by their model. On the other hand, current social and cultural activities might not be comprehensive to the village culture, which might damage the relationship between the actors.

7.8. Summary

In this chapter, I reviewed the strategic design interventions of the Smart Village through investigating the actor relationships. I started with an overview of the Smart Village project. The investigation consists of the actor's context, their responses to the strategic design intervention and how the intervention affected the relationship between the villagers and the Smart Village.

I initially provided an overview of the Smart Village where I explained the projects of the organization initiated the Smart Village project, the technologies demonstrated in the field, choice of the Village, the main operations as well as the organizational structure of the project. The findings of this chapter indicated that the organization that initiated the project has previous experiences on the field. On the other hand, it can be analyzed that the concept of the Smart Village is already designed forehand and adopted later on to the most suitable village in terms of its physical availabilities and the social characteristics. The organizational structure of the Smart Village consists of a project team and sponsors. According to the findings of the study, the

sponsors of the project provide the main resources -both financial and in-kind resources including; products, fertilizers, pesticides, agricultural machinery. This presence of the support shows a higher dependency on inside operations towards the needs of the sponsors. In the following sections, I analyze the six strategic design interventions of the Smart Village to attract the villagers to promote smart and facilitating technologies in the Smart Village.

Table 4.2 demonstrates the main findings of the sections explaining strategic design interventions of the Smart Village in terms of the actors' context, their responses to the intervention and the effects of the interventions in the interaction of the actors.

Table 7.2. Findings on Strategic Design Interventions

Strategic Design Intervention	Participants	Actors' interest, desires, conditions.	Responses of the actors to the Intervention	Interaction between the villagers and Smart Village
Crop Selection	Villagers	Dependent on the outside factors such as climate change, governmental incentives.	Does not prefer to take risks on new crops that does not provide direct financial return.	Seek the guidance of the Smart Village on the breeding existing crops in the plain with the facilitating technologies.
	Smart Village	Willing to present new crops to the plain that is promoted in the Smart Village facility.	Does not change the strategies regarding to the expectation of the villagers.	Promotes the crops to the villagers who are interested in Smart Village model.

153

Plant Breeding Plot	Villagers	Seek for employment for financial and social security.	Prefer to be employed by the Smart Village for plant breeding plot more than going to daily wage job.	Tend to interact with the facilitating technologies and the Smart Village trough the employers who works in the field and uses the technologies in their own land.
	Smart Village	Willing to follow the plant breeding schedule to follow the contract with the sponsors, willing to inspire villagers about the new uses of the technologies. trough the products demonstrated in the field., need field workers.	Prefers to close the land for interaction of the villagers as a way to deal with the communication problems. Not expecting the demand towards employment.	Manages the conflict of interests between the villagers and Smart Village by focusing on the internal organizational activities and closing the project for the outside interruptions.
Smart Pasture	Villagers	Need a short-term financial return	Knowledge increase on animal breeding. Prefer to use the Smart Pasture and invests on animal breeding. Increase in	Tend to spend significant time in the Smart Pasture area. Consider Smart Village as a service provider.

			sense of ownership regarding the system.	
	Smart Village	Willing to promote the smart pasture technology with its scientific implications.	Expects the support of the villager in the operation of the Smart Pasture.	Willing to be appreciated by the villagers for the support that it provided.
Entrepreneurship Program	Villagers	Seek for short term financial gain.	Cannot apply the technologies due to lack of land and knowhow.	Consider Smart Village as a service provider. Lacks sense of ownership towards the program and the outputs of the program.
	Smart Village	Expects women to become entrepreneurs by applying the technologies demonstrated inside the greenhouses in their field.	Confused about the ownership regarding to the output of the program.	Abstains from the creation of a similar program, seeks for alternative approaches with more regulation. Expects villagers to be more attentive to the programs as such.
Trainings	Villagers	Willing to increase the knowledge on issues that will contribute to	Interested in the training programs that has a tangible output.	Interact with the Smart Village team and facility that contributes to their knowhow on the

155

		their livelihood.		
	Smart Village	Wiling to promote the Smart Village facility to wide range of farmers.	Seek for alternative ways to understand the needs of the farmers.	Collaborated with the actors as public authorities to reach more villagers.
Social and Cultural Activities	Villagers	Seek for alternatives for social and cultural activities.	Benefit from the services as children club that foster attitude change towards the Smart Village model.	Expect Smart Village to provide social and cultural activities as a service.
	Smart Village	Willing to persuade the villagers about the positive implications of the Smart Village model.	Lacks capacity to provide an extensive approach in social and cultural activities.	Abstains to provide continuous social and cultural activities due to the conflicts faced with the villagers.

CHAPTER 5

CONCLUSION

In this chapter, I present the conclusions of the study. I begin with an overview of the flow of the thesis. I continue with the main conclusions of the study based on the analysis of the findings.

9.1. Overview of the Study

This study aimed to understand the potential learnings of a rural development project in Turkey by investigating its strategic design interventions. The research had a focus on mainly how the strategic design interventions shape the relationship of the actors the Smart Village team and the villagers. The reason for that was to understand how the primary collaborating actors' relations give insights about the acceptance of the new practices in the rural context. Therefore, I explored each strategic design intervention carried out in the Smart Village project with a focus on the actors' settings, their responses to the interventions, and their interactions with each other.

In *Chapter 2,* I presented the literature that creates the baseline of my field study. I started with Actor-Network Theory, which focuses on the relations of actors with each other, with the network in which they are positioned and their actions of shaping their relationship. The primary importance of this theory was to understand its intersections with design discipline. In co-design, where actors collectively create artefacts, with an Actor-Network Theory perspective, the process of designing objects becomes designing things, which means to understand the actors in its nature and create continuous and adaptive things that fits with the everchanging nature of the action. This discussion created the baseline of the second topic, where I discussed the social responsiveness of the design field. I presented two design practices; Socially Responsible Design and Design for Social Innovation. These two practices illustrated

how design practices can produce short-term solutions for the problems of disadvantaged communities (SRD) or how designers can serve as a collaborating actor for co-creation of new opportunities for complex challenges (DSI). Finally, I finished with the rural development practices in the Turkish context with a historical overview, barriers, and exemplifying sample initiatives.

In *Chapter 3*, I presented the research approach and the methodology of the study. I gave a detailed overview of the choice of research methods, ethnography, and interviews and their implications to the field. Finally, I presented the data analysis techniques I followed in this research.

In *Chapter 4*, I presented the main findings of the study. I begin with a description of the Smart Village by providing the history, main interventions, and organizational structure. The analysis followed by six strategic design interventions of the Smart Village including; Facilitating technologies on crop selection, Plant Breeding Plot, Smart Pasture, Entrepreneurship Program, Trainings, Social and Cultural Activities.

The final chapter of this thesis presents the main conclusions of the study. With the baseline gathered through literature review and data analyzed in findings, major conclusions will be presented.

9.2. Prominent Conclusions

I will present four conclusions based on the findings I illustrated. I will explain the conclusions in the form of a chain of discussion.

First, starting from the conceptual design of the project, there were many decisions given, such as selecting the Village, defining the scope of the project, determining the types of interventions. The decisions were shaped by the conditions of the Village (Section 4.1) as well as the capacity of the project itself. However, these were not the only factors. Especially the actors involved in the organizational structure of the Smart Village affected the implementation of the project interventions. In the example of plant breeding plot in Section 4.3, to run the operational activities as planned, the

project team limited their interaction with the Village when they faced the problem and closed the Smart Village plot with hedges. Even though this action represents a symbolic attitude towards the villager, it also shows how some decision-making process decreases the transparency of the operations. As Latour (1987) explains the term black box; when a system becomes too complex to analyze, there is a tendency to lean the process only in terms of its inputs and outputs. In the case of Smart Village, to run the operations according to contracts (Section 4.3.2.2), to manage the scale parallel with the sponsors (Section 4.1.2) the project is unrevealing heterogeneity and unfinished pieces (Moser and Law, 1999) and has turned into a black box from the point of the Villagers.

As a result of this, Villagers might not visualize, notice, and collaborate with Smart Village to participate in the co-creation of new opportunities. Black boxing of the project might have caused a perception from the villagers that Smart Village is a free service provider (see Section 4.4.3, Section 4.5.2.4.). In addition to that, even though the project focuses on the high involvement of the villagers, black boxing of the project intends a top-down approach that does not create a space for understanding the grassroots practices of the villagers. As the service provider perception illustrates, it creates a dependent model where the villagers cannot execute the operations of the Smart Village without the presence of its implementing team. As Manzini (2014) suggests, top-down models need a stable orientation of social and cultural values to be accepted from society. Opening the black box or making the processes of the project visible by the other actors might be initiated by designing interventions that do not have precise inputs and outputs in line with the project. Instead, turning the interventions into open-ended experiments can create a space for communication among the actors. In addition to that, visualizing each actor's presence in the network might support the unboxing of the project.

Second, the villagers tended to lower their risk. Many reasons can be given as in the literature illustrates barriers towards rural development (see Section 2.3.2), but one of the primary purposes is to lower the uncertainty with a guaranteed economic return.

159

Interventions as Smart Pasture (see Section 4.4) or the recruitment strategy (see Section 4.3.3) in the plant breeding plot provide these values to the villagers. Instead, these barriers again highlight the Smart Village as a facility who is concerned with its internal operations, provides employment and benefits the village through its services. In addition to that, the expectations among the actors are seemingly unclear (see sections 4.3.2.2, 4.3.3 and 4.5). A reason for this is the above-mentioned closed nature of the project, which lacks interaction among the actors. On the other hand, there are some interventions which increases the interaction among the actors and their relationship with the project.

When I examine in which type of interaction villagers tend to use the products or services that Smart Village presents, I see that they are more likely to implement the products in their land when a fellow villager tried and tested a facilitating technology in his area or use the services when a farmer brings his animal to the pasture. Noted that, Smart Village land has 88 acres (see Section 4.3.1) of land that already proves how facilitating technologies increase productivity or proves by number the potentials of Smart Pasture. However, the villagers tend to take the risk mostly when a person under their conditions attempts to take the risk beforehand. This person becomes the mediator of the translations among the actors, bridging the negotiation between the actors.

This shows that the shared goals towards the interventions is dependent on the scale of interaction. It can be reached through peer interactions rather than through an interaction between organizations and individuals. It also shows that local values among peers can trigger the implementation of new ideas such as smart technologies, which will foster social change. Therefore, rather than focusing on more extensive services on intervention, small-scale interventions supported by the peers can support the creation of collaborative environments, foster social innovation and increase the interaction, negation and exchange of experiences between the actors.

Third, when the strategic design interventions of the project are examined, a pattern of Socially Responsible Design practices can be observed. First, it carries a mission to develop smart agricultural products and systems that will change the agricultural production future. Which can be explained as a top-down mission towards social change. Second, it does not produce with its resources. In other words, it is not designed as a market-led model. Third it is supported by funders or sponsors as a part of their CSR projects.

Adding on the conclusions above, exposing SRD practices is leading the Smart Village to solve only a technical problem of the villagers rather than serving the rural complexity. The interventions provided short-term solutions (see Section 4.4 and 4.5) most of the time, require funds and produce dependent financial mechanisms. The project limits itself to be representatives of rural gadgets and is highly reliant on the supply chain of the smart products. As I explained in Section 2.2.2.2, SRD projects might not promote a longer-term change in the beneficiary's lives. Rather the projects are criticized to have short-term solutions.

Based on the relationship established between the villagers and the Smart Village team, it is possible to say that, in design decisions, the project might carry our DSI practices. Initially, the project serves a substantial complexity with multiple actors and gives a mission for long term change. Therefore, the smart agricultural products are not the goal but tools to accomplish a particular purpose. The strategic design interventions produce an attitude change in the actors as the examples of Smart Pasture (see Section 4.5) and Children Club (see Section 4.7.1) illustrate. To foster attitude change, Smart Village should focus on the patterns of collaboration within the local and continuously prototype and test the idea. Rather than promoting gadgets, the project should increase the personal capabilities of the farmers to create a favorable environment for social change, where farmers can accept the new ways of solving the problems, open to exchange ideas with different groups and individuals. This approach might increase people's desirability to experience new things, knowledge and awareness (Manzini, 2015).

Fourth, DSI practices explain the baseline of social innovation through new economies. They accept the emerging collaborative networks as the tool that initiates social change. In other words, they might consider the new economy as a given to initiate social innovation. Even though the collaborative networks are prevalent in some levels in urban settings, in the rural setting that I conducted my ethnography, it is not possible to mention the presence of such a network. A sign for that could be the financial conditions, culture, and attitudes of many farmers which limit their actions to become a part of new ideas such as what Smart Village presents on new crops (see Section 4.2). The conditions of the villagers also limit the creation of what Manzini (2015) calls enabling ecosystems, where a local community from the village initiates a collaboration with the Smart Village for a social change. Manzini (2015) believes that, with the small collaborations that sparked in the local context, social innovation can be replicated at the policy level.

The lack of new economies or enabling ecosystem does not necessarily mean that DSI is not suitable for rural settings. In the rural settings as this thesis demonstrates, a bottom-up organization in the rural setting might not be possible until a significant increase availability and development of the collaborating networks. This shows that a DSI practice in rural settings requires a top-down mechanism that might, over time; be formed into a hybrid model. As this thesis illustrates, being top-down can only be possible by understanding the grassroots practices and not building a large-scale intervention but focus on small scale increases in capabilities. Also, increasing the capabilities is not only relevant for the actors living in the rural setting such as villagers but also the capabilities of other collaborating actors such as sponsors, universities, local municipalities should be taken into consideration since the change requires a systemic transformation.

In conclusion, the aim of this study to understand the potential learnings of a rural development project in Turkey through an investigation of its strategic design interventions. As the findings illustrate, first, over time, closing the project to the participation of the villagers, made the project black-boxed. To prevent this; the

project could be carried out as an open-ended experiment where the actors can participate freely and visualize each other's conditions, expectations. Second a smaller scale of intervention is essential to initiate social innovation that is supported by local values. Instead of generating larger interventions, small scale interventions through peer learning supports the increase in villagers' adaptation to change Third, the project should be considered as a DSI implementation rather than an SRD project with its mission of long-term social innovation; therefore, the perception of producing gadgets should be evolved into contributing to capabilities. Fourth, DSI practices in rural context may require an initial focus on increasing the capabilities of actors at each level.

9.3. Limitations and Further Research

This research investigated the actor relationships in the Smart Village project by focusing on a series of interventions made by the Smart Village officers to increase the interaction with the villagers. They also want to increase the use of the products and services they demonstrated in the Smart Village campus. To observe what type of relationship built by the actors based on these interventions, I conducted an ethnography. As I explained in Section 3, during my research, I stayed for 18 days in the Smart Village in the summer period, which is mainly harvesting for agricultural products, and, therefore, I did not observe any of the planting processes. Also, in that period, there were no social, cultural activities, trainings, and entrepreneurship programs. Therefore, I did not have the opportunity to observe those interventions while they occur. As a result of this, I have limited data on the direct implications of strategic design interventions. A long-term investigation of those interventions might provide deeper insights and suggestions on the implication of the project.

Second, this research is conducted with a design for the social innovation perspective particularly focusing on the actor relationships. On the other hand, the Smart Village project interventions have different outcomes through different disciplines including sustainability, economy, sociology, and business. Even though the nature of the study

generates such complexity, a further study on these disciplines can generate a broader view on the projects and its implications for rural development.

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172

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A. INTERVIEW GUIDE (IN TURKISH)

Röportaj Rehberi

1. **Akıllı Köy çalışanlarına yönelik soru rehberi**
   Genel demografik bilgiler
   Akıllı köydeki görevi ve çalışma biçimi
   - **Eğitim**
     - Eğitimlerin içeriği
     - Eğitimlerin amacı
     - Katılımcılara ulaşım
     - Katılımcıların eğitimlere tepkisi hakkındaki düşünceler
     - Karşılaşılan zorluklar, fırsatlar, potansiyeller
   - **Sosyal ve Kültürel Aktiviteler**
     - Aktivitelerin türü
     - Aktivitelerin amacı
     - Aktivitelerin hedef kitlesi
     - Aktivitelerde köylü ile olan ilişkilenme biçimleri
     - Karşılaşılan zorluklar, fırsatlar, potansiyeller
     - Aktivitelerin tasarımı
   - **Bitkisel Üretim Alanı, Akıllı Mera ve Diğer Kolaylaştırıcı Teknolojiler**
     - Geliştirilen teknolojiler ve amaçları
     - İşleyişi
     - Köylü tarafından kullanımına yönelik yapılan çalışmalar ve kullanım pratikleri
     - Karşılaşılan zorluklar, fırsatlar, potansiyeller
   - **Girişimcilik Programı**
     - Programın amacı ve sonuçları
     - Programın tasarımı
     - Programa katılıma yönelik çalışmalar
     - Köylülerin program sürecindeki katılımları
     - Karşılaşılan zorluklar, fırsatlar, potansiyeller
   - Saha çalışanları için: Geleneksel çalışma pratikleri
   - Teknoloji ile ilişkilenme biçimleri

2. **Çiftçi ve Köylülere yönelik soru rehberi**
   Genel demografik bilgiler
   Çalışma hayatı pratikleri
   - **Eğitim**
     - Eğitimlere katılım (direnç) nedenleri
     - Eğitimlerden haberdar olma biçimi
     - Eğitim içeriklerine ve süreçlerine dair düşünceler
     - Eğitimlerden beklentiler
   - **Sosyal ve Kültürel Aktiviteler**
     - Aktivitelere katılım (direnç) nedenleri
     - Aktivitelerden haberdar olma biçimleri
     - Aktivitelere dair düşünceler
     - Aktivitelerden beklentiler
   - **Bitkisel Üretim Alanı, Akıllı Mera ve Diğer Kolaylaştırıcı Teknolojiler**
     - Sergilenen teknolojiler ile ilgili düşünceler
     - Teknolojilerden faydalanma biçimleri işleyişi
     - Günlük hayatta tercih edilen yöntemler
     - Teknolojileri kullanma biçimleri
     - Teknolojiler ile ilgili zorluklar, fırsatlar, potansiyeller
   - **Girişimcilik Programı**
     - Programdan beklentiler
     - Program deneyimleri
     - Programda karşılaşılan zorluklar, fırsatlar
     - Programın tasarımına ilişkin düşünceler

B. CONSENT FORM (IN ENGLISH)

Volunteer Participation Form

This research is carried out within the scope of the MSc research of the METU Industrial Design Department. The study is organized to understand the applications of technology in rural areas. In this context, the technologies prepared by technology developers and their works, technology trainings developed for farmers living in the field of technology application, active use of smart agricultural technologies, and the structure of strategic design interventions aimed at increasing farmers' participation in the project will be examined. At the same time, the current use practices of the developed smart agricultural technologies will be evaluated in from both farmer and developer contexts.

The data obtained as a result of the observations and interviews will be used only for scientific purposes, during the thesis research, in scientific publications and presentations. The anonymity of the institution and individual will be ensured. By signing this form, you understand that you have been informed about the research to be conducted and that you have approved the interview.

Participation in the study is voluntary. The research does not pose any risk to the participants. The information provided by the participants and the results of the research will not be shared with persons other than the researchers.

Thank you for your contribution.

☐ I have read and accepted the above.

Name/Surname

Date:

Signature:

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