

## **Adaptive Parts for an Adaptive Whole**

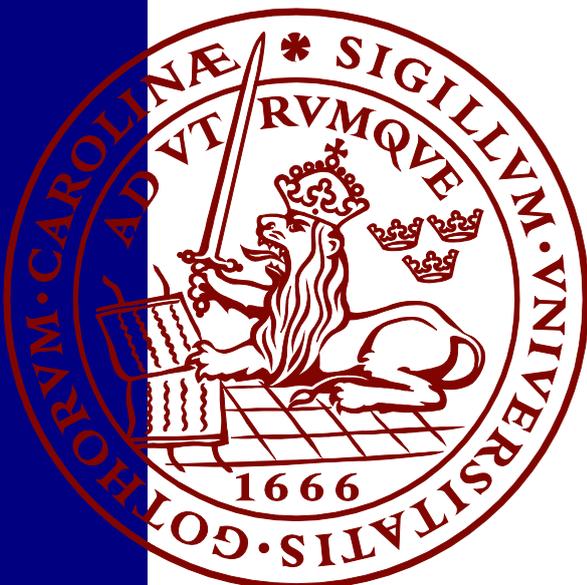
What it is about change-agents that makes them adaptive?

*Mert Cetinkaya*

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# **Adaptive Parts for an Adaptive Whole**

**What is it about change-agents that makes them adaptive?**

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A thesis submitted in fulfillment of the requirements of Lund University International Master's Programme in Environmental Studies and Sustainability Science (LUMES) for the degree of Master of Science

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# Abstract

The transformational mode of sustainability science is concerned with generating actionable knowledge and practical solutions to complex sustainability challenges in order to facilitate a transition towards sustainability by strategizing transformational pathways. However, some scholars in the field believe that sustainability science lacks such capacity, since so far greater focus has been put on describing and analyzing complex coupled human-environment systems rather than producing practical solutions to transform them. In some successful cases in resilience literature, it has been demonstrated that key individual change-agents may play important leadership roles in building resilience and adaptive management in the system in which they operate. Thus, this thesis mainly promotes that studies which focus on change-agents and leadership should be more extensively included in the sustainability science research agenda in respect to the transformational mode of sustainability science.

Given the significance of change-agents for building adaptive management systems through the establishment of key actor networks, this study attempts to explicate the relationship between the adaptive capacity of management systems and that of change-agents. For such explication, first, logical and theoretical linkages between the leadership practices of key individuals in adaptive management systems and social entrepreneurs in social innovation systems are built. This is done by considering both actor groups as change-agents involving themselves in the process of bricolage, which refers to recombining available resources for systemic transformation and institutional innovation. Secondly, this thesis explores the adaptive capacity of change-agents in relation to their engagement, as innovators, through the innovative processes of bricolage. To explore this issue, seven semi-structured interviews were conducted with social entrepreneur change-agents in Istanbul, Turkey, and qualitative analysis was further employed to analyze the data. Results from this study illustrate that change-agents meta-cognitive capacity of Personal Epistemological Beliefs (PEBs) influence the quality of their observation skills in the system, as well as their flexible learning processes. Moreover, the capacities for suspension and redirection are identified as two underlying capacities that enhance the quality of change-agents' observational skills. These observation skills and related capacities lead me to recognize change-agents' capability for presencing, that is presented as a capacity of learning from the future as it emerges. All together, these capacities are considered as the significant components of change-agents' adaptive capacity.

**Keywords:** *adaptive capacity, change-agents, bricolage, Personal Epistemological Beliefs, presencing, sustainability science*

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# Contents

- 1. Introduction.....7
  - 1.1 Thesis Rationale .....8
  - 1.2 Research Question: .....9
- 2. Theoretical Framework .....10
  - 2.1 Sustainability Science: What is Next?.....10
  - 2.2 Resilience Theory, Adaptive Management and the Modes of Sustainability Science: How the Change Comes About? .....11
  - 2.3 Change-agents and Bricolage: the Process of Change Making.....14
  - 2.4 The Blind Spot of Leadership and Adaptive Capacity of Change-agents.....18
- 3. Methodology .....21
  - 3.1 Research Design .....21
  - 3.2 Research Method and Data .....21
  - 3.3 Ontological and Epistemological Considerations.....22
- 4. Results and Analysis .....23
  - 4.1 Change-agents’ Interior Conditions of Epistemology: Personal Epistemological Beliefs .....23
    - 4.1.1 *First PEB: Constructed Knowledge and Uncertainty of Knowing* .....23
    - 4.1.2 *Second PEB: Complexity and Interconnectedness of Knowledge* .....24
    - 4.1.3 *Third PEB: Continuous Process of Knowing and Tentative Knowledge*.....25
    - 4.1.4 *Making Sense of PEBs a Meta-Cognitive Capacity* .....26
  - 4.2 Learning by Sensing and Listening: The Quality of Observation Skills and Two Capacities.....26
    - 4.2.1 *The Capacity of Being Aware of Assumptions: Suspension*.....27
    - 4.2.2 *The Capacity for Paying Attention to the Relationship between the Source and the Whole: Redirection*.....28
  - 4.3 Presencing: Embodying, Knowing and Enacting the Observation .....31
  - 4.4 Thesis Rationale Revisited .....34
- 5. Conclusion .....35
- 6. References .....37
- Appendices .....43

# 1.Introduction

How do we mobilize and harness science and technology to address today's complex sustainability challenges faced by humanity? Sustainability science, a problem-driven and action-oriented scientific field, was established roughly a decade ago to seek answers to this question (Clark & Dickson, 2003; Kates & Parris, 2003; Kates et al., 2001). Sustainability science aims to improve our understanding of the essential characteristics of interactions between nature and society and how coupled human-environment systems function (Kates & Parris, 2003; Kates et al., 2001). Based on this improved understanding, sustainability science also strives to find and develop practical solutions to address complex challenges (Clark & Dickson, 2003). Scholars in the field consider these two distinct aims within two different modes of sustainability science, the descriptive-analytical and the transformational mode (Wiek et al., 2012b). The descriptive-analytical mode is related to analyzing problems in coupled human-environment systems whereas the transformational mode is concerned with finding practical solutions to these problems (ibid). Recently, a scientific conversation in the field began to explore to what extent sustainability science targeted its goals (Clark, 2007; Jerneck et al., 2010; Spangenberg, 2011; Wiek et al., 2012a; Wiek et al., 2012b). So far, the significant amount of focus and effort has been put on the descriptive-analytical mode (Wiek et al., 2012b). Regarding the transformational mode, the field of sustainability science somewhat lacks the capacity to bring practical solutions, generate action, and develop strategic transition pathways in order to achieve sustainability goals (ibid). Therefore, a greater amount of focus and effort should be channelized towards uncovering how sustainability science can contribute to solving sustainability problems, rather than just improving our understanding of these problems (Jerneck et al., 2010; Wiek et al., 2012b).

By briefly reviewing the literature related to resilience theory, adaptive management and Socio-Ecological Systems (SESs), which are among prominent theories and frameworks in sustainability science, it can also be seen that the primary focus has been on describing and analyzing the past, current and desired future state of coupled human-environment systems, based on normative sustainability goals. Through such a review, some cases that have been presented as success stories for adaptive management were found (Hahn et al., 2006; Hughes et al., 2007; Olsson et al., 2008; Olsson et al., 2007). In these cases, one could see the significance of the transformational leadership practices of key individual actors, whom facilitate the resilience and adaptive management building process by establishing the required institutional settings, social networks, and creating space for social learning and collaboration (ibid). Therefore, when it comes to making sustainability happen, sustainability science should recognize the importance and relevance of focusing on these key individual change-agents as research subjects within the domain of its transformational mode. Thus, this thesis is an attempt to demonstrate such overall relevance and importance.

This study's focus on key individuals in adaptive management systems transcends the field of sustainability science as it also considers social entrepreneurs, the change-agents in social innovation systems. Such an expanded scope is relevant because, regarding its transformational mode, sustainability science can learn about significant practical and theoretical aspects of change making from the growing field of research on social entrepreneurs and social innovation (Alvord et al., 2004; Goldstein et al., 2010; Mair & Marti, 2006; I. Popoviciu & Popoviciu, 2011; Yujuico, 2008). By building relevant theoretical and logical linkages between key individuals in adaptive management systems, and social

entrepreneurs in social innovation systems, I use the term “change-agents” to denote both of these actors. I further demonstrate the relevance of these two fields by (re)conceptualizing the adaptive management building practices of key individuals, and the transformational practices of social entrepreneurs, under the common concept of *bricolage*. The concept of bricolage is used here to describe the process of making the best of available resources by combining them in new ways to create and innovate solutions for complex problems (Goldstein et al., 2010; Yujuico, 2008). Thus, the change-agents are considered as bricoleurs, (i.e. persons who engage in bricolage (Yujuico, 2008)). By taking the roles of bricoleurs, change-agents involve in the innovation process by identifying relevant stakeholders as resource holders (knowledge, capital, etc.) and engaging them to the social network; furthermore, they facilitate the process of mobilizing and recombining these resources in order to innovate and address the problem (Goldstein et al., 2010).

Scharmer (2010) claims that for such transformational and innovative leadership practices that are enacted by change-agents, asking the question of “who?”, in order to address the individual self, is particularly important, rather than the questions of “what?” and “how?” which address the action and process. Sections 2.2 and 2.3 explain the questions of what and how through the concepts of adaptive management, social innovation and finally, bricolage as a common concept. These sections set and frame the context in which the question of “who?” can be explored. By asking “who?”, Scharmer refers to the source level of leadership, “the inner place or state of awareness from which leaders operate” (2010, p.3). This source level sets individual change-agents’ “interior conditions”, where innovative, transformative, and creative leadership practices come into being (ibid). By setting the context as the bricolage system, I ask the question of “who” to explore the adaptive capacity aspects of change-agents’ innovative leadership practices. Thus, this thesis explores the adaptive capacity of individual change-agents which enables them to be flexible learners (Fazey et al., 2007), manage different knowledge, perspectives and assumptions of their stakeholders, sense opportunities for innovation, and adapt to the novelty generating, complex system of bricolage.

## 1.1 Thesis Rationale

“Sustainability is an emergent property of a complex system; we can observe it only if all the relationships on which it depends are functioning correctly.”

(Ehrenfeld, 2007, p.59)

Studying sustainability science made me aware of the fact that the definition of *sustainability* is highly contested in the academic world. Also, being involved in sustainability related conversations with many individuals over the course of the past two years has lead me to recognize that many people have different understandings of the sustainability concept. Therefore, I present my own understanding of sustainability; my thesis rationale is also based on this understanding. I see that the transition to sustainability has to happen in two domains. The first one is about harmonizing our social systems with the working principles and characteristics of natural ecosystems. Renowned physicist, ecologist and system thinker Fritjof Capra refers to this as “reconnecting with the web of life” which means “building and nurturing sustainable communities in which we can satisfy our needs and aspirations without diminishing the chances of future generations” (1997, p.289). He claims that to achieve such a task, we need to learn the basic principles of ecology and the characteristics of ecosystems, which are essentially sustainable communities of plants, animals and other organisms (ibid).

He further maintains that having an understanding of the principles of organization of ecological communities, and using those principles as guidelines, is needed to create sustainable human communities (ibid). Capra primarily presents these principles as interdependence, recycling, flexibility, diversity and sustainability (ibid).

Sustainability Science, dominated by its analytic-descriptive mode, also attempts to address this first domain. As an example to this argument, I can state that the concept of resilience was first suggested by Holling (1973) as a characteristic of ecological systems. In sustainability science, the concept of resilience is used in the context of coupled human-environment systems “as a framework for understanding how to sustain and enhance adaptive capacity in a complex world of transformations” (Folke et al., 2002, p.437). Moreover, active adaptive management is presented as an effective tool to build resilience (ibid). Adaptive management suggests that a management system should also utilize some fundamental ecosystem principles for establishing necessary novel institutions and governance mechanisms in order to deal with complexity and uncertainty (ibid). These principles include self-organization in social networks, flexibility in decision-making, diversity and interdependence of stakeholders in the network, and the system’s overall capacity to adapt and learn (Folke et al., 2002; Olsson et al., 2004; Pahl-Wostl, 2009).

By concerning the transformational mode of sustainability science, I raise the question of whether it is possible to achieve adaptive management without individuals, who are involved in the system, having the necessary capacity to be flexible, recognize diversity and interdependence, “learn” and “adapt”. By raising this question, I refer to the second domain that transition to sustainability has to happen, which is about harmonizing individuals’ inner place and interior conditions with the principles of ecosystems; the human dimension. In a larger cultural context, this harmonization may be seen as shifting from anthropocentric values to more ecocentric ones, as deep ecology would suggest (Capra, 1997) or considering all ethical and philosophical dimensions (Ehrenfeld, 2007). However, in the context of adaptive management, these interior conditions refer to the adaptive capacity of individuals, as explained in the introduction section. Therefore, in this thesis I attempt to explicate the relationship between the adaptive capacity of the system (the whole), and that of individual’s (parts), by exploring what makes change-agents adaptive. By addressing the below question, I am able to explore these capacities, and the analysis that I conduct in answering this question will enable me to explicate this important relationship.

## **1.2 Research Question:**

“What are the significant components of change-agents adaptive capacity?”

## 2. Theoretical Framework

### 2.1 Sustainability Science: What is Next?

In the early 2000s, sustainability science emerged from a call for establishing a new field of science which seeks to understand the fundamental characteristics of interactions between nature and society (Kates et al., 2001). By defining the goal of sustainability as meeting the needs of society while sustaining the life-support system of the planet, these interactions have been framed under coupled human-environment systems, and analyzed by various studies concerned with issues related to agriculture, energy, water, fisheries, urbanization, international development, etc (Clark, 2007; Kates & Parris, 2003; Wiek et al., 2012b). Sustainability science has flourished as a result of earlier movements to harness science and technology as a means to facilitate the transition towards sustainability (Clark & Dickson, 2003). The mission of facilitating this transition constitutes the action-oriented and solution-oriented characteristics of the sustainability science field. To achieve such a goal, in the past 10 years, since the first call was made, there has been a significant focus on analyzing coupled human-environment systems in order to improve the understanding of the dynamics of these systems (Wiek et al., 2012). In a similar fashion, and also emerging with the call for sustainability science, many scholars developed novel frameworks and theories, and conducted studies to analyze how to enhance sustainability, resilience, and adaptive capacity of Social-Ecological Systems (SESs) (Hughes et al., 2007; Lebel et al., 2006; Olsson et al., 2004; Olsson et al., 2008; Ostrom, 2009). These related scientific efforts aim to build an actionable body of knowledge which can be utilized by practitioners and set the foundation for actions in transition towards sustainability (Clark, 2007).

Roughly a decade after the first call, a scientific conversation concerning the structure, intensions and modes of sustainability science started among prominent scholars in the field (Jerneck et al., 2010; Spangenberg, 2011; Wiek et al., 2012a; Wiek et al., 2012b). This conversation mainly included two questions concerning, what sustainability science achieved so far, and how it can better contribute to solving complex sustainability problems in the future (Spangenberg, 2011; Wiek et al., 2012a). Wiek et al. (2012b) address these questions by discussing the constructive tension between two modes of sustainability science: the descriptive-analytical and the transformational modes. The descriptive-analytical mode is related to the analysis of coupled human-environment systems and mainly deals with the conceptualization and framing of complexity and uncertainty that are inherent to sustainability challenges (Spangenberg, 2011; Wiek et al., 2012b). A dominant focus in the field towards this mode is based on the supposition that improved understanding of a complex problem may also offer solutions (ibid.).

Additionally, there is a strong belief in the field that for achieving sustainability goals, we need more than analysis, description, information and structuring, regarding coupled human-environment systems and complex sustainability challenges (Jerneck et al., 2010; Spangenberg, 2011; Wiek et al., 2012a; Wiek et al., 2011). Here, the transformational mode of sustainability science gains importance, as it aims to bring practical and comprehensive

solutions to sustainability problems. Wiek et al. (2012b, p.6) argue: “The transformational mode suggests that sustainability science has to go beyond the questions of how coupled human–environment systems have evolved (past), are currently functioning (present), and might further develop (future)”. Thus far the descriptive-analytical mode of sustainability science has succeeded to bring valuable insights about the current state of coupled human–environment systems and provided visions and scenarios for reaching a necessary state, based on the normative concepts of sustainability goals (Spangenberg, 2011; Wiek et al., 2012b). Yet, sustainability science in many ways lacks the capacity for bringing practical solutions and constructing pathways (Wiek et al., 2011). Now, it is necessary that a significant amount of research effort, focus and attention should be directed to answer such operational, practical and strategic questions regarding how to get to a desired system state from the current state by establishing transition pathways (Spangenberg, 2011; Wiek et al., 2012b). Therefore, focusing more on the transformational mode necessitates the consideration of some major theories and frameworks that exist in the field of sustainability science, regarding its two distinct modes

## **2.2 Resilience Theory, Adaptive Management and the Modes of Sustainability Science: How the Change Comes About?**

In this section, I will discuss resilience theory, active adaptive management and social-ecological systems (SESs) with regards to the modes of sustainability science mentioned above. Having been developed within and co-evolved with the field of sustainability science, resilience theory, active adaptive management, and social-ecological systems are some of the major theories and frameworks that focus on adaptive management of social-ecological systems and often deal with natural resources management (Hughes et al., 2007; Olsson et al., 2008; Ostrom, 2009). In sustainability science, the concept of resilience is understood as a system’s capacity to buffer change, learn and develop (Folke et al., 2002). Folke et al. (2002, p.437) states that the resilience concept is used as “a framework for understanding how to sustain and enhance adaptive capacity in a complex world of rapid transformations”. The capacity of resilience is understood as a desired state for a system to reach; building this capacity is seen as a normative goal in order to achieve sustainability in complex socio-ecological systems, where there are high levels of uncertainty and non-linear interactions among the parts (ibid). Elinor Ostrom’s (2009) highly acknowledged concept of Social-Ecological Systems (SESs) is often employed as a general framework to analyze and explain the complex dynamics of SESs through the identification of various subsystem variables. In resilience literature, this concept is often used to denote complex, coupled human–environment systems by focusing on the self-organizational aspects of the system and its sub-systems, with the purpose of enhancing resilience and sustainability of the whole (ibid). Given that both resilience and SESs mostly deal with how a system has evolved, how it is currently functioning, and how it should be in the future, they can be considered within the descriptive-analytical mode of sustainability science.

Regarding the transformational mode of sustainability science, active adaptive management has been suggested as a tool to achieve resilience and sustainability in SESs in several studies (Folke et al., 2002; Lebel et al., 2006; Olsson et al., 2004). In order to create space for learning and increase adaptive capacity, adaptive management can facilitate the necessary social context, which includes flexible and open institutions and multi-level governance systems (Folke et al., 2002). This social context also establishes a platform to bridge sectors and organizational levels and engage various user and interest groups for knowledge sharing and collaborative learning about the management of SESs (Olsson et al.,

2004). Such a platform allows the processes required for adaptive management to emerge, such as trust-building, vertical and horizontal collaboration, learning, sense-making, identification of common interests, and conflict resolution (Stockholm Resilience Centre, 2011). The processes and platforms are included in the social context, which manifests itself through the social networks of actors and stakeholders.

In adaptive management, social networks facilitate information flows, identification of knowledge gaps, and create nodes of significant expertise for ecosystem management (Olsson et al., 2004). Thus, these networks play an important role for co-managing information and knowledge among interest groups with different worldviews (ibid). Moreover, social networks constitute a flexible institutional structure which creates space for creativity and collaboration to innovate, which is essential for problem solving for sustainability challenges (Folke et al., 2002; Olsson et al., 2008). To achieve adaptive management and take collaborative action to build resilience, these social networks should be connected through larger organizational objectives, purpose, trust and shared vision for the whole system (Hahn et al., 2006; Olsson et al., 2004; Olsson et al., 2007)

Above, I considered the concept of adaptive management to be within the transformational mode of sustainability science, since it is presented as a tool to achieve resilience and sustainability in SESs management (Folke, Carpenter, Elmqvist, Gunderson, & Holling, 2002). These tools comprehensively lay out necessary strategies and normative goals for a system to follow by establishing a solid body of actionable knowledge. However, these concepts still lack practicality in terms of building pathways for a transition towards sustainability and resilience from that body of actionable knowledge. In other words, the available literature does not extensively answer the question of how to bring forth action based on knowledge of necessary management systems and our understanding of how SESs function.

However, in the available literature, there are some case studies that are often presented as good examples of adaptive management and resilience building, namely: Kristianstads Vattenrike Biosphere Reserve in Sweden (Hahn et al., 2006; Olsson et al., 2007), the Great Barrier Reef in Australia (Hughes et al., 2007; Olsson et al., 2008) and the Grand Canyon in the United States (Hughes et al., 2007). Reviewing these studies and related articles leads me to recognize the significant role of leadership in establishing adaptive management structures that facilitates a social context for building resilience (Hahn et al., 2006; Olsson et al., 2008). Individual actors in these systems serve as key players in institution building and organizational change aimed at achieving adaptive management and facilitating horizontal and vertical linkages in the adaptive management processes by establishing flexible social networks (Olsson et al., 2004). In these examples, individual and organizational leadership can be seen, which has the capacity to find practical solutions, develop strategies, and create transition pathways. Thus, concerning the transformational mode of sustainability science, the concept of leadership and practices of key individuals in the system gain particular significance to further focus on.

In order to elaborate the significance of key individuals and the role of leadership in resilience building practices in SESs, I will focus on the example of Kristianstads Vattenrike Biosphere Reserve (KVBR), a wetlands reserve located in Southern Sweden, including the lower Helgeå River catchment and the coastal regions of Hanö Bay within the Municipality of Kristianstad (Olsson et al., 2007). The story of the KVBR started in early 1980s when some local individuals and organizations had experienced continuing decline in natural and cultural

values in the area (ibid). First attempts for collaborative management of the wetlands, which started in 1989, later led to the foundation of a municipal organization called Ecomuseum Kristianstads Vattenrike (now called the Biosphere Office) (ibid). The Bridging characteristics of this organization, such as engaging stakeholders, connecting knowledge, creating shared vision and its ad hoc structure, have all played a crucial role for building adaptive co-management in KVBR (Hahn et al., 2006; Olsson et al., 2007).

The process, which stretches from an earlier anticipation of an ecological and cultural crisis to the establishment of a biosphere reserve, was mainly facilitated by transformational leadership practices of three key individuals, whom also founded the bridging organization of Ecomuseum Kristianstads Vattenrike (EKV) (Hahn et al., 2006). Throughout the process, these key individuals successfully established the required social context and learning networks for adaptive co-management (Folke et al., 2002; Hahn et al., 2006); as Olsson et al. states:

“Bridging organizations play a crucial role in the dynamic relationship between key individuals, social memory, and resilience. They coordinate the interactions among a range of actors at different levels of society and nodes of expertise and a diversity of experiences and ideas for solving new problems. The governance networks of the KVBR constitute multilevel arrangements that are particularly appropriate for solving problems of complex adaptive systems because there is experimentation, knowledge generation, and learning going on in each of the nodes. It seems like such experimentation, in combination with the bridging function, may nurture sources for renewal and reorganization and increase the capacity to deal with uncertainty and abrupt change in SES.” (2007, p.12)

Here, it is significant that knowledge generation and sharing, problem solving, and the development of a learning culture were spread by EKV through the network of actors, with the aim of mobilizing different resources of relevant stakeholders in order to achieve adaptive co-management, sustainability and resilience. Thus, along the process, one could witness the leadership capacity of these key individuals in relation to innovating, creating, and establishing a novel, ad hoc institutional setting, mentioned above in Olsson’s quote. Moreover, I here specifically use the concept of leadership to identify individual’s competencies and skills, which facilitate the system’s transition towards a collectively desired state (in this case resilience, adaptive management, sustainability) by engaging a variety of stakeholders, trust-building, creating shared vision and common purpose for the actors, and establishing flexible institutions and knowledge networks. Here, this leadership capacity and individual change-agents gain further significance for the transformational mode of sustainability science, as they bring action and establish pathways for a transition towards resilience and sustainability.

Change-agent and leadership practices, as well as achievements beyond the field of SESs management, can also be observed. In the field of social change and innovation, there are significant works by social entrepreneurs/change-agents, who are also key individuals in similar complex, diverse, flexible institutional settings of social innovation systems, which include stakeholder networks of the business, public sector, and civil society (Mair & Marti, 2006; I. Popoviciu & Popoviciu, 2011). Therefore, one could consider key individuals in successful resilience building cases as social entrepreneurs due to their similar leadership practices. In the next section, an explanation will be delivered as to the analytical and logical linkages between the social entrepreneurs and key individuals in adaptive co-management

systems. Here, answers are given as to why social entrepreneurs are chosen as central theoretical and empirical subjects for this study and further demonstrate the relevance of change-agents to the modes and topics of sustainability science discussed in Section 2.1.

## 2.3 Change-agents and Bricolage: the Process of Change Making

There is an increasing amount of academic and non-academic literature, knowledge generation, and experimentation focusing on the fields of social entrepreneurship and social innovation (Alvord et al., 2004; Goldstein et al., 2010; I. Popoviciu & Popoviciu, 2011). There is a potential for sustainability science to gain new insights from practical and actionable knowledge regarding how individuals or groups of visionary actors make change happen. Especially, knowledge and methods regarding the concepts of leadership and change-makers developing from the practical works of organizations like Ashoka, Unreasonable Institute, Presencing Institute, Authentic Leadership in Action, and MIT's Society for Organizational Learning may extend the positive transformational impact of sustainability science, if the right theoretical and practical linkages are made.

Research on social entrepreneurship is still largely phenomenon-driven and only started to get scholarly attention from a variety of disciplines in the last decade (Alvord et al., 2004; Mair & Marti, 2006). Due to the lack of a unifying paradigm, a variety of meanings have been attached to the term "social entrepreneurship" (Dees, 1998; Mair & Marti, 2006). Thus, the concept of social entrepreneurship is poorly defined and its boundaries to other fields of study are not clear (ibid). Since there is no academic consensus on the definition, I have chosen to employ Dees' (1998) definition. This definition will serve my purposes, as it relates to the discussion of linkages between key individuals and social entrepreneurs and considers social entrepreneurs more as change-agents, rather than market entrepreneurs. Dees states:

"Social entrepreneurs play the role of change agents in the social sector, by:

- Adopting a **mission to create and sustain social value** (not just private value),
- Recognizing and relentlessly **pursuing new opportunities** to serve that mission,
- Engaging in a **process of continuous innovation, adaptation, and learning**,
- **Acting boldly without being limited by resources currently in hand**, and
- Exhibiting heightened accountability to the constituencies served and for the outcomes created" (1998, p.4).

Based on this definition, common attributes between social entrepreneurs and key individual change-agents in adaptive management systems can be identified. Referring to section 2.2, key individuals who take leadership roles in adaptive management also recognize their mission to generate and maintain social and environmental value, thus, to produce sustainability. They create and pursue new opportunities by identifying and finding new key stakeholders and expert nodes for the social network they are building. Their roles as leaders guide them to establish flexible institutions and networks which create a space for innovation, adaptation and learning. Additionally, their leadership capacity enables them to engage in different processes of innovation, adaptation and learning, and to utilize these processes for their mission. Moreover, by acting like entrepreneurs, these key individuals efficiently exploit and utilize resources and opportunities that they have and constantly seek, create, and collaborate for new ones. These logical linkages between the concepts of social entrepreneurs and key individuals regarding their practices and leadership capacities allow me to use a

common concept which denotes both. Thus, I will from now on use the term *change-agents* to refer to both of these concepts.

Furthermore, the role of change-agents in systems, especially the relation to use of resources, may refer to Levi's Strauss's (1966) concept of *bricolage*, which is used here to describe making the best of available resources by combining them in new ways to create and innovate solutions for problems (Yujuico, 2008). Bricolage is also seen as the potent source of innovation brought about by entrepreneurs and social entrepreneurs (Desa, 2009; Goldstein et al., 2010). The term *bricoleur* is used to denote a person who engages in bricolage (Yujuico, 2008). This concept can help me to further understand the correspondence between social entrepreneurship in social innovations systems and the practices of key individuals in adaptive management systems by seeing change-agents as bricoleurs.

From the perspective of complexity theory, Goldstein et al. (2010) argues that there are two important parameters for social innovation to happen in a system and for its potent source, the process of bricolage, to be activated. These parameters are *opportunity tension* and *informational differences* (ibid). Opportunity tension refers to the realization of the complexity of the problem that a community is facing and that individuals or groups of individuals cannot solve the problem with a business-as-usual approach (ibid). Goldstein et al. (2010, p.105) claim that "A level of cooperation and coordination is needed, i.e. a degree of organizing, is necessary to address the complexity of the situation"; this recognition leads individuals to organize in collective action. In some cases, this recognition can be developed simultaneously by various actors (Alvord et al., 2004). Also, change-agents may facilitate the process of collective recognition by addressing the problem in specific contexts with key stakeholders and demonstrating how both problem and solution relates to them, as demonstrated in the EKV case (Hahn et al., 2006; Olsson et al., 2007).

The second parameter is informational differences, which Goldstein et al. (2010) refer to Gregory Bateson's (1972) well-known definition of information as "difference which makes a difference". They see it as "the diversity that fuels creative innovation" (Goldstein et al., 2010, p.106). In the field of social innovation and adaptive management, this parameter indicates differences in perspectives, goals, and know-hows that exist among the actors in the context of the problem or opportunity (ibid). They further state that even though there is a high level of opportunity tension, the system may not enter the domain of innovation if the relevant information to address the problem is not widely spread through the parts and actors are not aware of the differences (ibid). Thus, information may not be accessible to many, and the value of this parameter could be low (ibid). The reason for this might be that the system is not yet organized in a way which facilitates effective communication of information. If the social or socio-ecological system wants to utilize this information and informational differences to innovate and create solutions, a degree of organization is needed to identify, amplify, collect, understand, and combine the information effectively as a whole (ibid).

The effective degree of organization may refer to the necessary structural qualities of social networks that exist in the system. These qualities include their flexibility for collaboration, learning and adaptation, efficiency for communication, and potential for innovation and problem solving, as discussed in Section 2.2. Furthermore, when the value of the parameter of informational differences increases, the information becomes more accessible to the actors in the system and then is "utilized through the formation and dissemination for mobilizing collective action to bring about social innovation" (Goldstein et

al., 2010, p.106). As I discuss in the EKV case in Section 2.2, change-agents have the capacity to increase the value of this parameter by establishing necessary institutional settings, build and expand social networks that have the necessary quality, and create an atmosphere of trust, collaboration, communication, innovation and creativity. Change-agents have leadership capacity and skills to influence both of the parameters mentioned above (ibid).

Goldstein et al. (2010) also assume that there is a fixed opportunity tension parameter in these systems at a level so that “two organizing approaches exist, the old way of doing things and a better, although as yet undefined, way of organizing” (p.107). Here, the emergence of a new way of organizing represents the innovation process initiated by change-agents (ibid). The emergence phase is heralded by informational differences and the process further utilizes informational differences through exploring, appreciating, and synthesizing them, adding new network connections by engaging more stakeholders (ibid). Change-agents achieve this engagement by demonstrating the benefits of new way of organizing to the key actors (Alvord et al., 2004; I. Popoviciu & Popoviciu, 2011).

Goldstein et al. (2010, p.109) derive their definition of emergence from general system’s theory and complexity theory (Nicolis & Prigogine 1989) as “spontaneous arising of new systemic structures, novel patterns and properties out of a system’s own internal dynamics rather than through a hierarchical imposition.” The process of recombination is the key emergent novelty generation mechanism of the system (Goldstein et al., 2010). Goldstein et al. (2010) discuss the concept of recombination from the perspective of different scientific fields and present it as the process of employing existing resources in a different way; they quote Nelson and Winter (1982, p. 130) by referring to “the creation of any sort of novelty in art, science, or practical life – consists . . . of a recombination of [extant] conceptual and physical materials.” In the context of emergence-based understanding of social innovation, recombination can be seen as seeking better combinations of existing components in the system lined up with the opportunity for new ways of organizing (Surie & Hazy, 2006). Through such a frame of social innovation, the key role of recombinatory mechanisms can be understood as the method of bricolage. Levi Strauss (1966) used the concept of bricolage to describe the creation of practical and religious products in a culture by recombining things at hand (Goldstein et al., 2010). It has also been suggested that the term bricolage refers to resource mobilization for new ways of organizing and creating “newness” in social innovation systems (Desa, 2009). The recombinatory strategy of bricolage is a potent source of social innovation in social enterprises, since it is the major emergent novelty generating mechanism of the system; moreover, the innovative process of bricolage comes about from skillful change-agents who act as bricoleurs and the social networks that they build (Desa, 2009; Goldstein et al., 2010).

Given that change-agents’ leadership capacity is particularly important for building the recombinatory strategy of bricolage; in Section 2.4 and the Chapter 4, I will attempt to further understand this capacity. In French, the term bricolage refers to resourcefulness and adaptiveness (Goldstein et al., 2010). Also, the process of bricolage is an adaptive process, as the system recombines its resources in order to adjust to change through new ways of organizing (ibid). Therefore, I recognize the relationship between the adaptive qualities of the bricolage system and the adaptive capacity of change-agents, which I see as an important component of larger leadership capacity. Here, *adaptive capacity* refers to change-agent’s ability to cope with emergent novelty generation, complexity, and uncertainty, all characteristics of the bricolage process which is at the heart of social innovation and adaptive management systems. This logical linkage is also particularly related to the system theory

perspective on the relationship between the parts and the whole. Senge et al. (2005, p.6) states that “a part, in turn, was a manifestation of the whole, rather than just a component of it. Neither exists without the other. The whole exists through continually manifesting in the parts, and the parts exist as embodiments of the whole.” Thus, the relationship between the adaptive attributes of the bricolage system (the whole) and the embodiments of these attributes by change-agents (the parts) as capacities has to be further explicated by exploring the significant components of the change-agents’ adaptive capacity. Thus, the adaptive capacity aspect of the change-agents’ larger leadership capacity becomes the focus of my analysis.

When faced with situations where resources at hand are inadequate to address shared problems, change-agents often use their creative and innovative skills to combine these resources—natural, human, social, physical and financial capital— for new ways of organizing to address the problem (Yujuico, 2008). Goldstein et al. (2010) claim that there are many social components available as resources that can be recombined by change-agents to strategize the bricolage process and construct emergent innovations. Goldstein et al. (2010, p112) identify these components as:

“organizational/community capabilities including leadership and followership expertise; operational proficiencies; knowledge management resources; organizational structures such as extant governance bodies; existing information technology resources; other technologies and technological know-how; capacities for knowledge and technology transfer; multiple funding streams; multiple organizational and social missions; and the multifarious existing social networks in operation in collaborations, partnerships, community organizations, government bodies, businesses, and so forth.”

One could also witness this recombinatory bricolage process in the case of EKV as demonstrated in Section 2.2 (Hahn et al., 2006; Olsson et al., 2007).

Change-agents’ role as bricoleurs has also been referred to as “institutional entrepreneurs” by some scholars (Leca et al., 2008; Mair & Marti, 2006). DiMaggio (1988) introduced the notion of institutional entrepreneurship to explain how institutions transform or emerge and sees institutional entrepreneurs as actors who leverage and recombine resources to transform existing institutions or create new ones (Fligstein, 1997). The institutional entrepreneurship perspective on change-agents can be further explored by a sociological discussion of structure and agency. In this discussion, scholars (see Mair & Marti, 2006) often refer to the duality of agency and structure (Bourdieu 1977; Giddens, 1984) and some further see it as “paradox of embedded agency (DiMaggio, 1988; Holm, 1995), i.e. actors acting in consort become catalysts for structural change within an institutional structure that exerts pressures on these actors” (Goldstein et al., 2010, p.114). Although these sociological insights can improve the understanding of the change-agent phenomenon, a profound discussion of structure and agency is far beyond the scope of this thesis.

Thus far, I have demonstrated the significance of key individuals and their resilience building practices in adaptive management systems by focusing the discussion on sustainability science’s transformational mode. Then, I built logical linkages between these key individuals and social entrepreneurs, and connected them under the concept of change-agents. Moreover, I showed the correspondence between social entrepreneurship in social

innovation systems and practices of key individuals in adaptive management systems through Goldstein et al's (2010) complexity theory approach to social entrepreneurship in social innovation systems. I argued how the opportunity tension and informational difference parameters are common in both systems and how change-agents in both systems have leadership capacities and skills to increase the value of these necessary parameters. I further explained that bricolage is the common key process in both systems for generating novel structures, patterns and institutions. I also highlighted the leadership capacity of adroit change-agents as they develop recombinatory strategies of bricolage by acting as bricoleurs. By first demonstrating the significance of key individuals in adaptive management systems and then explaining the role of change-agents in the process of bricolage, I draw the attention to the leadership capacity of change-agents. I further stressed on the adaptive capacity aspect of the change-agents' leadership capacity, given its particular significance in the context of the bricolage process. Thus, it is essential to further explore and explicate this adaptive capacity in order to improve the understanding of transformative and innovative leadership practices of change-agents in related systems.

## **2.4 The Blind Spot of Leadership and Adaptive Capacity of Change-agents**

I earlier explained my concept of leadership as the total of change-agents' competencies and skills, which facilitate the transition towards a collectively desired state in adaptive management systems. This is done by engaging a variety of stakeholders, trust-building, creating shared vision and common purpose for the actors, establishing flexible institutions and knowledge networks. Based on the discussion in Section 2.3, I can again refer to the same explanation by not only concerning adaptive management systems, but also generalizing to bricoleurs in complex adaptive systems of social innovation. My general description of the leadership concept is relevant to the change-agents' practices in the context of bricolage. However, it is not specific and operational enough to be utilized in my analysis to explore the change-agents' adaptive capacity. Therefore, my discussion and model of leadership and change-agents directs more towards the adaptive capacity aspect by looking at recent theories of leadership (Scharmer, 2010; Uhl-Bien et al., 2007; Wheatley, 2007). Scharmer (2010, p.2) claims that, for institutional transformation and systemic innovation, there is a need for collective leadership capacity "to draw together all key stakeholders and involve them in a process that begins with uncovering common intention and ends with collectively creating profound innovation on the scale of the whole system."

Conventional leadership models of the last century can be considered as products of top-down, bureaucratic paradigms (Uhl-Bien et al., 2007) and were effective for economies based on physical production and industry, where control, standardization and predictability are highly needed for the system's efficiency (Senge et al., 2005; Uhl-Bien et al., 2007). In today's knowledge based economy, where complex institutional and organizational settings exist, these models and managerial logics of the industrial age do not suit well (Uhl-Bien et al., 2007). Here, Scharmer argues that today, leaders and change-agents are faced with unprecedented, complex 21st century leadership challenges, yet they find themselves equipped with a 20th century management toolkit that is insufficient to address these challenges. Uhl-Bien et al. (2007, p.298) suggests "a different leadership paradigm that focuses on enabling the learning, creative, and adaptive capacity of complex adaptive systems within the context of knowledge-producing organizations." Scharmer (2010) maintains that in such leadership paradigms, one should go beyond the questions of what change-agents do and

how they do it. He raises the importance of the source level, “the inner place or state of awareness from which leaders operate” (ibid, p.3) and claims that in general, we are not aware of the interior conditions, that is the source dimension, from which innovative, adaptive and effective leadership and social action come into being (ibid). Here, he focuses on the question “who” to denote the individual self and interior conditions, rather than the questions what and how. The questions of what and how were explained in Sections 2.2 & 2.3, in terms of adaptive management building practices, social innovation and the process of bricolage. Answering these questions enabled me to set the context of bricolage where the question of “who” in relation to the adaptive capacity can be explored. Therefore, such question of “who” functions as a main guide for this thesis, specifically for my results and analysis as I attempt to explore the significant components of the change-agents’ adaptive capacity.

In resilience and adaptive management literature, the adaptive capacity of individuals for an adaptive system has already received some attention (I. Fazey, 2010; I. Fazey et al., 2005; I. Fazey et al., 2007; Reed et al., 2010). I. Fazey et al. (2007) claim that the adaptive capacity of the system can be enhanced by fostering the adaptive capacity of its individual members. They further suggest that the ability of individuals to adapt to changing circumstances and to alter their behavior is important for building and maintaining social-ecological resilience (ibid). According to their arguments, in order to develop adaptive capacity, individuals must learn how to learn flexibly by varying the way skills and abilities are practiced (ibid). Such an understanding of learning for the whole of system is considered *social learning*, and achieving social learning in social networks is seen as a normative goal for adaptive management systems (Pahl-Wostl, 2009; Reed et al., 2010). Reed et al. (2010, p.5) claim that “if learning is to be considered social learning, it must demonstrate that a change in understanding has taken place in the individuals involved. This may be at a surface level, e.g., via recall of new information, or deeper levels, e.g., demonstrated by change in attitudes, world views or epistemological beliefs.”(2010, p.5). Even though such learning is desirable for all of the individuals involved, participation and stakeholder engagements do not always facilitate such learning environments for all (ibid). However, key change-agents, both in adaptive management and social innovation systems, often facilitate and engage with such flexible and adaptive learning through the networks in order to manage the informational differences parameter and develop the process of bricolage (Alvord et al., 2004; I. Fazey et al., 2005; Goldstein et al., 2010; Hahn et al., 2006; P. Olsson et al., 2007; I. Popoviciu & Popoviciu, 2011).

I. Fazey et al. (2005) argues that such flexible learning for adaptive capacity can be achieved through “opening up” to take different perspectives of stakeholders. Flexible learning skill is needed because practices and perspectives of stakeholder’s are diverse (ibid). Therefore, individuals can develop flexible learning skills by constantly reflecting on and changing their mental models and assumptions of how the system operates as they receive information feedback from the system (ibid). This also refers to the recombinatory process of bricolage as change-agents utilize informational differences in the system (Goldstein et al., 2010). I. Fazey et al.’s (2005) model of adaptive capacity and flexible learning is based on double-loop learning which includes individuals reflecting on their action and experience, taking on different perspectives, changing their mental models and coming up with new decisions. However, they do not explain the capacity that drives this process or breaks the process of reactive learning, which “is governed by downloading habitual ways of thinking, of continuing to see the world within the familiar categories we are comfortable with” (Senge et al., 2005, p.10). I am not rejecting Fazey et al.’s (2005) model for adaptive capacity and flexible learning which is based on reflecting on the experiences of the past (Scharmer,

2000a). Yet, through my analysis, I attempt to improve it by enlightening the blind spot that drives the flexible learning process and exploring a different kind of learning not solely based on the past. Therefore, by asking the question of “who”, my research on adaptive capacity is directed to the inner place and interior conditions of individual change-agents which drive and facilitate this flexible learning process and enable them to cope with and learn from the novelty generating, complex system of bricolage.

Since I am interested in the interior conditions and inner place of change-agents, the field of cognitive science can guide me through my results. Here, I use two different conceptions of cognition. First one is the general concept of cognition as mental processes (Varela et al., 1991). In relation this concept, adaptive capacity can be linked to mental abilities which make change-agents adaptive. It is believed that cognitive factors are important for how change-agents adapt and respond to today’s complex challenges (I. Fazey, 2010). The second one refers to Maturana and Varela’s (1980) Santiago Theory of Cognition which also sets a ground for my analysis as I explicate the relationship between the system’s adaptive capacity and that of change-agents’. They see cognition as the very process of life, and living as a process of cognition (ibid). Fritjof Capra (1997) claims that “since cognition traditionally is defined as the process of knowing, we must be able to describe it in terms of an organism’s interactions with its environment.” (p.260). Maturana and Varela (1980) explain this as living systems which structurally couple themselves with their environment through knowing and adapting or in other words “to live is to know” (Maturana & Varela, 1987). Thus, the interactions of a living system with its environment are cognitive interactions (Capra, 1987). Moreover, the range of interactions a living system can have with its environment defines its cognitive domain (ibid). Therefore, by presenting my results as cognitive capacities and skills, I can suggest that they are the products of individual’s structural coupling through their interactions with their environment in the process of bricolage. Thus, the context of bricolage enables change-agents to develop such cognitive capacities as components of their adaptive capacity. This adaptive capacity later manifests itself in change-agents transformational leadership practices which enhance the system’s overall adaptive capacity. Thus, such reinforcing loop should be considered throughout my analysis which mainly explicates this important relationship between the parts and the whole.

## 3. Methodology

### 3.1 Research Design

This thesis project is a qualitative exploratory study based on in-depth, semi-structured interviews, peer-reviewed articles, both academic and non-academic literature and books. A researcher's guiding scientific interests of particular theories and concepts, disciplinary perspectives and research backgrounds provide points of departure to develop ideas, to form interview questions, to listen to interviewees, and to think analytically about the data (Charmaz, 2006). Therefore, the theoretical framework presented in Chapter 2 is built from this perspective. Due to my interest in the concepts of leadership and change-agents, I brought these concepts to the field of sustainability science and further integrated them to my theoretical framework, where I explore the adaptive capacity of change-agents. Moreover, my admiration of system thinking explains my attempts to build both relational and analytical linkages between the whole and the parts and to focus on the relationships in my overall theory. Beyond these initial departure points, I present my results as specific concepts by studying the collected data and examining my ideas through successive levels of analysis. Thus, this analysis process includes both deductive and inductive approaches to the relationship between the theory and research. Such an approach can be called iterative: "weaving back and forth between data and theory" (Bryman, 2008, p.12). Regarding my iterative strategy, the concepts presented in Chapter 2 regarding the theoretical framework such as, bricolage, change-agents, leadership, adaptive capacity, flexible learning, and interior conditions of leadership are used as a background to my qualitative investigation by forming my model of analysis. These concepts enabled me to employ deductive reasoning to frame the context where the adaptive capacity of the change-agents can be explored. Later, my results, demonstrated in Chapter 4, are induced from the empirical data. In Section 4.3, I further employed inductive reasoning to carry on my discussion to identify additional components of adaptive capacity and synthesize my findings with my model of analysis.

### 3.2 Research Method and Data

The empirical data for this study was primarily collected through seven in-depth, semi-structured interviews. The in depth nature of the semi-structured interview provides insights into how research participants view the world (Bryman, 2008) and "fosters eliciting each participant's interpretation of his or her experience" (Charmaz, 2006, p.25). Thus, the semi-structured interview is appropriate for this study since I am exploring how individual change-agents see themselves being adaptive and flexible learners through their experiences in the bricolage system. The semi-structured interview refers "to a context in which the interviewer has a serious of questions that are in the general form of an interview guide but is able to vary the sequence of questions" (Bryman, 2008, p. 699). The interview guide used in this study can be found in Appendix IA.

Semi-structured interviews were conducted with seven social entrepreneurs, as I earlier demonstrated their relevance to the research topic of this study and presented my theoretical justification for such relevance. Moreover, research subjects of this study were collected using snowball sampling which involves making "contact with a small group of people who are relevant to the research topic and then uses these to establish contact with others." (Bryman, 2008, p.184). I established the first contact with The Hub Istanbul. The

Hub is a member-driven global network of collaborative workspaces focused on social innovation and impact entrepreneurship. I reached to other respondents through The Hub Istanbul's network. My study sample included social entrepreneurs from the countries of Turkey (4), Germany (1) and the United States (2), three females and four males who are at the ages between 23 and 49 (see Appendix IB for the list of the interviewees).

Furthermore, the collected data was analyzed by identifying common themes which emerged from the interviewees' statements and explanations. In an iterative fashion, the themes and subthemes are reciprocally generated by reading and rereading the transcripts as a form of inductive analysis (Bryman, 2008) and the key concepts in the model of analysis are derived from the theoretical framework as a deductive approach. As a part of this iterative strategy, initial core themes informed a tentative hypothesis to be addressed through a general research question, then through the analysis the research question was revisited and refined as the hypothesis was developed in more detail, through the identification of further themes and subthemes.

### **3.3 Ontological and Epistemological Considerations**

Given the divide between natural and social sciences, this study is considered as a social research. Therefore, it is relevant to consider epistemological and ontological stances exist in social sciences. Since I am interested in my respondents' point of view and subjective meaning related to their adaptive capacity and related leadership practices, I have an interpretivist epistemological standpoint (Bryman, 2008, p.16). Moreover, my ontological position is constructivism that "asserts that social phenomena and their meanings are continually being accomplished by social actors" (ibid, p.19). Specifically in this study, I believe that social phenomena of change-making, bricolage are in a constant state of revision because novelty generation mechanisms are in their very nature. Also, the meanings attached to these concepts by the actors who are involved in these phenomena are also in constant change.

## 4. Results and Analysis

In this chapter, I present and analyze the results of my study based on my interviews. I conducted my research on the adaptive capacity of change-agents. More specifically, I looked into what it is about these change-agents that make them adaptive during the process of bricolage, as they establish and involve themselves in social networks by interacting with numerous stakeholders. Through my analysis, I came up with three important points regarding change-agents' adaptive capacity. Here, I present individual change-agents' perspective on knowledge and knowing (Personal Epistemological Beliefs), their skills for observation, and the capacities that enhance the quality of observation skills as significant components of their adaptive capacity. These results enable me to further induce a theoretical discussion of three distinct knowledge forms and a new type of learning which are also essential for the adaptive capacity of change-agents. Also, this theoretical discussion allows me to expand my analysis of how the results corresponding to the adaptive capacity of change-agents relates to the adaptive process of bricolage.

### 4.1 Change-agents' Interior Conditions of Epistemology: Personal Epistemological Beliefs

Through my study, the data I collected led me to recognize how individual change-agents' views of knowledge and knowing influence their adaptive capacity, as my respondents talked to me about their perspectives on knowledge. It is appropriate to refer at this point to the concept of Personal Epistemological Beliefs (PEBs) which is the beliefs people hold about learning, the nature of knowledge and how something is known (I. Fazey, 2010; Tickle et al., 2005). In the last twenty years, the concept of PEBs has been widely considered in educational psychology as it is seen as an important meta-cognitive capacity for both learning and teaching (Bromme et al., 2009). However, the concept has recently started to be recognized by scholars for individual's adaptive learning capacity (Bromme et al., 2009) and the role of these beliefs in transformational leadership behaviors (Tickle et al., 2005). Educational physiologists studying PEBs developed some prominent frameworks to analyze different dimensions of these beliefs (Alvord et al., 2004). Although I did not employ any of these frameworks since this is not a psychological or pedagogical study, my conceptual findings may show similarities with the earlier studies of Perry (1981) and Schommer (1990, 1994). As the first part of my results, I will present my own conceptions of different categories of PEBs.

#### 4.1.1 *First PEB: Constructed Knowledge and Uncertainty of Knowing*

Mainly, my results show that my respondents do not hold the belief that there is an objective reality that is independent from the minds and experiences of the subjects. Respondent 3 mentions: "Current reality is always a new reality that reality in the moment. The ecosystem evolved in that moment and that time. There is no single truth, right? There is no single reality. It is a moving reality as my and other people's ideas, perspectives and vision change". Here, they refer to the concept of reality as a complex, dynamic and plural ontology,

which includes but transcends objectivity. Therefore, every individual's knowing and knowledge of that reality may be different as their access to reality differs due to their mental models, assumptions, ideas and perspectives on things. Also, they recognize that their knowing and knowledge is uncertain, since they acknowledge the difference in every individual's access to reality. Respondent 5 states; "I am definitely a big fan of constructivism. For example, people look at the world today through the reflections of their ideas. You know, people's outlook is the manifestations of their objectives and ideas but who says that it is the right way to look at the world through these ideas? Everyone has a different one". This view can be further explained by philosophical perspective of radical constructivism which "assumes that knowledge, no matter how it be defined, is in the heads of persons, and that the thinking subject has no alternative but to construct what he or she knows on the basis of his or her own experience" (von Glasersfeld, 1995, p.1). Through such understanding of knowing, they also recognize that their knowledge of the system in which innovative process of bricolage occurs is incomplete because it is limited by their own experiences, ideas and perspectives. This belief that they have about their own knowledge enables them to be humble and go beyond the hubris of what they already know.

Moreover, from a constructivist point of view, they believe that other actors' knowledge of the system is also incomplete. However, their knowledge is different and valuable since they also construct it through their own experiences and perspectives. Thus, they seek and reach out to key actors who hold information and knowledge of the system that is relevant and useful for the bricolage process. Later, these actors can possibly be included in the social network. Respondent 5 says that "At the end of the day, it is just a reality that people have different ideas by coming from different backgrounds, different contexts, growing up in different circumstances, developing within the different personal, societal, political culture. If you don't accept that fact, you cannot see the bigger picture of the system that you are involved in".

This capacity leads them to manage informational differences parameter efficiently. Based on their epistemological beliefs, they can naturally accept informational differences and are willing to bring these differences together through networks, and then utilize it for the process of bricolage. Respondent 2 states: "Yes, you reach out to your stakeholders in order to get a clear picture of the current reality and learn about other people's truths, what they are thinking, their ambitions and their assumptions. I believe that you have to incorporate other people's assumptions and truths outside of your organization to your organization's reality as well".

#### ***4.1.2 Second PEB: Complexity and Interconnectedness of Knowledge***

Another finding related to PEBs is that my respondents believe that knowledge is complex and interconnected. They see their key stakeholders as important knowledge resources. Related to the beliefs discussed in Section 4.1.1, they have the capacity to identify the informational differences and recognize the relevance of various knowledge holders to the bricolage process that they are actively involved in. Additionally, based on this PEB, instead of just viewing these knowledge holders as experts and gathering facts from them, they put effort into connecting these different knowledge resources together which is also essential for the recombinatory process of the bricolage (Hahn et al., 2006; P. Olsson et al., 2007). They think that knowledge should be shared through the networks as relevant stakeholders are continuously being connected to each other. Thus, knowledge itself can be recombined and

emerging novel knowledge can be utilized for further innovation and addressing the problem (Alvord et al., 2004; I. Popoviciu & Popoviciu, 2011). They see this process as creating a container of knowledge from which actors involved in the bricolage process can take collaborative action towards innovative solutions.

Furthermore, my respondents see themselves as connectors among different resources of knowledge and their organizations as platforms for knowledge sharing. Respondent 2 states:

“When we look at the world 50 or 60 years ago, the world’s knowledge was pretty much organized in silos, such as the academic institutions, the private and the public sector. You had different knowledge generating and containing systems that were actually parts of bigger ecosystem, but they were not aware of this bigger system and there were walls between those different knowledge silos. That is the history of how society was organized. However, today the walls between those silos are breaking and we see more and more connections and relations between actors in different given systems. This is how it is supposed to be in order to address today’s complex problems. That is also what I am interested in my work because I believe that my organization should be a platform that enables the breaking of the silos. I mean that I should facilitate a process that brings various resources, ideas, stakeholders to achieve something better and bigger out of this new emerging reality.”

Based on this perspective, they do not only arrange meetings with key stakeholders where they can interact but also create a social network where both formal and informal, active knowledge sharing becomes a normative operation for the actors in the network. These change-agents run a variety of projects where these social networks already exist and the private sector, the public sector, and academic institutions collaborate and innovate together.

#### ***4.1.3 Third PEB: Continuous Process of Knowing and Tentative Knowledge***

All my respondents stated that being open and curious make them adaptive and flexible learners. The first PEB leads them to hold another belief that knowledge is tentative thus learning should be flexible and continuous. They further claimed that every day they learn new things about their work and the innovation system that they are operating in through their daily experiences and interactions with their environment in the system of bricolage. Respondent 1 says: “I think my flexible learning capacity is the result of curiosity and openness. Every day I pick from the ideas that I am exposed to. I constantly reflect on what I know and I can easily unlearn what I previously know. In this way I can create new knowledge and know what my next steps should be.” This capacity is also in line with Fazey et al.’s (2005) suggestion of double-loop learning as the capacity for flexible learning and being adaptive. However, in this case, this capacity appears as more dynamic and continuous due to the first PEB presented in section 4.1.1. They do not tightly hold on to what they already know about the system. Thus, they create a flexible learning space for themselves by allowing their everyday experiences and ideas to which they are exposed to penetrate into their minds and reshape their mental models. By referring back to Maturana and Varela’s (1980) understanding of cognition as to live and to know, their cognitive systems structurally

couple themselves with their environment, both existing and emerging information and knowledge in the bricolage system, through their everyday interactions. Therefore, the capacity for continuous learning can be considered as a cognitive skill.

#### ***4.1.4 Making Sense of PEBs a Meta-Cognitive Capacity***

Values and belief systems of individual change-agents have significant influence on their transformational leadership behaviors and practices (Goldstein et al., 2010). The three PEBs presented in Sections 4.1.1, 4.1.2 and 4.1.3 enhance change-agents' adaptive behaviors and flexible learning practices in the context of their role as bricoleurs. Thus, these beliefs can be considered to be components of the change-agents' adaptive capacity. Also, individual's PEBs regarding the nature of knowledge and learning are often thought of as a meta-cognitive capacity which refers to one's awareness of, and active control over, his or her cognitive processes (Bromme et al., 2009; Schommer, 1990; Schommer-Aikins & Hutter, 2002; Tickle et al., 2005). PEBs lead change-agents to control and be aware of their own cognitive processes of learning and knowing. Thus, PEBs are the significant meta-cognitive capacity for one's self-regulated learning (Bromme et al., 2009). The first and third PEBs are relevant to personal self-regulated learning and drive the flexible learning process. The Second PEB refers to collective self-regulated learning and it enables an environment and creates a platform for flexible learning to happen both for change-agents and other actors. Three of them together constitute a crucial part of change-agents' adaptive capacity. In addition, they also influence change-agents' quality of observation skills which are the means for flexible learning. The next section presents the quality of observation skills as another component of adaptive capacity.

## **4.2 Learning by Sensing and Listening: The Quality of Observation Skills and Two Capacities**

PEBs, as a meta-cognitive capacity, influence the change-agents' cognitive process of flexible learning by both driving and enabling it. They also affect the change-agents' quality of observation skills which facilitates the flexible learning process and thus, contributes to adaptive capacity. From my analysis, I identified that my respondents' observation skills include sensing the whole system that they are part of and their consciousness about the significance of good listening. Sensing the whole system is an embodied skill that is continuously employed throughout the bricolage process. This skill includes seeing the patterns, underlying assumptions, dominant paradigms and interconnectedness that exist in the system. That is also related to the second PEB. Since they believe that knowledge is interconnected and complex, they always try to sense the bigger picture, as well as small details that form that picture, which together constitutes the whole. Sensing the whole system enables change-agents to recognize and utilize both the opportunity tension and informational differences parameters of the innovation system. Moreover, being conscious of the significance of good listening implies to that they strive for deeper levels of listening when they are interacting with their key stakeholders. They see deep listening as a mean to enhance flexible learning. This skill refers to the first PEB. Their constructed view of knowledge leads them to listen to learn since they find the knowledge, perspectives, ideas and views of their stakeholders particularly valuable for the bricolage process.

These two skills are not separated from each other. Together they form the change-agent's skill for observing the bricolage system. Respondent 2 refers to this observation skill by saying:

“When I first started my organization, I was reaching out to my key stakeholders and talking to them about my ideas. However, I actually preferred to just listen a lot more to what other people and other organizations want to achieve, how they react to these new concepts like social entrepreneurship, how they understand innovation, creativity, imagination. It was more than listening to just words. It was more like listening to the actions, like putting my ears to the ecosystem of social innovation which was kind of really active watching. Watching is more than just seeing what other people are doing. It is kind of listening to the mechanisms of other people's actions.”

This quote may refer to the skill of observation as a whole of both sensing and listening. These two skills are also connected to each other by two underlying capacities that enhance both of these observation skills. These capacities include the capacity of being aware of assumptions and the capacity for paying attention to the relationship between the source and the whole. The next section presents these capacities and further discusses their relation to the observation skills.

#### *4.2.1 The Capacity of Being Aware of Assumptions: Suspension*

By the capacity of being aware of assumptions, I mean change-agents' ability to recognize and be aware of their own assumptions, mental models and habitual patterns of thinking. This capacity enables change-agents to look at the reality of the system with fresh eyes and out of their own boxes. Respondent 6 states: “If you are against a certain perspective or idea right from the start because you hold an assumption contested with it, you will not be able to learn where that idea comes from or what are the fundamental understanding, objectives and views behind it. Thus, you have to recognize your assumptions and should not let them hold you back from listening with an open mind.” This capacity also refers to the concept of suspension (Scharmer, 2000a; Scharmer 2010; Senge et al., 2005). Scharmer (2007, p.9) defines this capacity as the suspension of judgment which means “shutting down (or embracing and changing) the habit of judging based on past experience”. It is being aware of our thoughts and mental models as the functionings of our mind (Senge et al., 2005) by “hanging our assumptions in front of us” (Bohm, 1990, as quoted in ibid, 2005). Senge et al. (2005, p.29) maintain that “suspension allows us to see our seeing”.

Suspension is particularly significant for learning because it enables individuals to open up a new space of inquiry and wonder (Scharmer, 2000a). Also, the first PEB can enhance the capacity of suspension. By the nature of the first PEB, change-agents recognize the deficiency of their knowledge which their mental models and assumptions are based on. Thus, they are more open to suspend them and willing to listen to others in a deeper sense by not judging their ideas. Suspension is not only applicable for listening but also for sensing the whole of the system. Scharmer (2000a) sees suspension as an indispensable ingredient for observing and seeing. By suspending, one opens up to what is actually happening in the

world, instead of imposing frameworks, mental models and judgments onto what they see in the world (ibid, 2000a; Senge et al., 2005).

#### ***4.2.2 The Capacity for Paying Attention to the Relationship between the Source and the Whole: Redirection***

All of my respondents often referred to the social innovation system that they are part of as the social innovation *ecosystem*. By referring to it as the ecosystem, they imply both their specific sub-system of bricolage and the bigger global system of social innovation with all different actors, organizations and institutions. They recognize that this ecosystem is complex and interrelated; it constantly evolves and changes. These perspectives manifest themselves as the skill for sensing the whole system in change-agents' practices. However, the quality of this skill comes from change-agents' capacity to see the whole from within by paying attention to the relationship between the source and the whole. By source I mean the change-agents themselves. They recognize and identify the patterns, assumptions and contents in the context of the whole. Then the attention is directed to their role in creating, shaping, reinforcing and changing that context and thus, the relationship between them and the context. On this, respondent 5 states:

“You have to understand the complexity through the eyes of your stakeholders; their backgrounds, different goals, different objectives. You need to figure out what these people are doing and why they do it. But, in order to embody your understanding of the complex system, you should constantly ask yourself; how do I fit into this system, how can I leverage the resources that my stakeholders have, what can be my contribution? So, I understand the context first and then, I find out how the exact contribution that I can give has to look like in that given setting. It helps me to form the picture of how the whole system looks like and at the same time, it helps me to learn how I want to contribute to it and where my role is in this dynamic, changing system.”

This capacity further refers to the concept of redirection that is, “redirecting one’s attention inward toward the source rather than the outward toward an object” (Scharmer, 2000a, p.17). Senge et al. (2005, p.41) explain this as the “fundamental shift in the relationship between seer and seen”. With the capacity of redirection, subject–object duality, based on individuals’ habitual awareness, begins to break up and people shift from the viewpoint of a detached observer who “looks out at the world” to looking from “inside” what is being observed (ibid). This perspective relates to change-agents’ understanding of the context through paying attention to their role of creating and changing it which is the relationship between the source and the whole. This capacity helps change-agents to “redirect” their awareness towards the generative process that lies behind what they see as assumptions, patterns and contents (ibid). The generative process is sensed by the source and later possibly enacted by the change-agent (ibid). This generative process is also at the heart of the innovative recombinatory process of bricolage which is further discussed in the next section. Scharmer sees this capacity as “connecting to the deeper forces of change through opening your heart” (2007, p.9).

The open mind (through suspension mainly of judgments or preconceived ideas) and open heart (through redirection of attention to the whole and feeling as a part of the whole) are crucial capacities for the change-agents' skill for observation, and thus, they are also important components of the adaptive capacity. The strong link between suspension and redirection sets the foundation for the observation skill. This link is explained by Varela (2000) as: "By redirection we mean that suspension will lead to see very early emerging events, contents, patterns, gestures, whatever. Then you can actually redirect your attention to them. That's where the new is. So the suspension creates a space, the new comes up, and then you can redirect. Redirection is a specific gesture." (as quoted in Scharmer, 2000a, p.17).

Suspension and redirection influence the quality of the observation skill of sensing the system as a whole through change-agents' general experiences and interactions in the system, whereas they enable listening to be used as an effective tool for observing and learning. By building suspension and redirection capacities, change-agents strive for deeper levels of listening. According to Scharmer (2000a, 2010), there are four levels of listening. In level 1, while listening, individuals attend to what they already know by downloading their habitual thought patterns and mental models due to not suspending (ibid, 2010). In listening 2, individuals recognize some new external facts by paying attention to everything that may be different than their mental models and anticipations; this refers to the suspension in action (ibid, 2000a). Listening 3 refers to empathic listening: "to see a situation through the eyes of another" (ibid, 2010, p.5). This level of listening enables individuals to take on different perspectives and see the patterns of the system, which is an essential tool for sensing the system as a whole (ibid, 2000a). For this level of listening, redirection is needed.

My empirical findings presented in Section 4.2.1 & 4.2.2 suggest that my respondent change-agents are able to operate in this level of listening. Firstly, their PEBs essentially lead them to listen emphatically. Secondly, their capacity of suspension and redirection call for employing level 3 listening as an effective tool for observing the bricolage system. Finally, Scharmer (2010, p.5) refers to level 4 listening as generative listening which is "to sense the highest future potential of another person or a situation". In this level, suspension and redirection capacities are fully utilized by the individual (Senge et al., 2005). Scharmer (2000a, p.32) differentiates level 4 from level 3 by stating; level 3 refers to sensing, while level 4 refers to presencing, and "the difference between the two is that sensing taps into emerging futures in one's environment while presencing uses one's highest self to sense and embody what is about to emerge". One's highest self refers to the concept of presencing which is further discussed in the section 4.3.

While sensing is about observing and seeing from inside the whole by paying attention to the relationship between the source and the whole, presencing is about embodying one's observation of what is emerging from this relationship. This embodiment later manifests itself as an action taken by the change-agent towards innovating in the bricolage system (Scharmer, 2007). My empirical findings imply that my respondents hold necessary observation skills and related capacities for presencing. Yet, presencing is more about knowing by intuition, rather than logical reasoning, as it is discussed in the section 4.3 where I present the concepts of self-transcending knowledge and primary knowing. Also, presencing is the outcome of the state of consciousness and awareness that is reached by employing the capacity of sensing, observing and perceiving the whole (Senge et al., 2005).

"When consciousness is restructured into an organ of holist perception, the mind functions intuitively instead of intellectually.

There is a lot of confusion and misunderstanding about intuition, as if it were something intangible and mysterious. (...) Orstein (1992) defines intuition as “knowledge without recourse to inference”. He links it with a simultaneous perception of the whole, whereas the logical or rational mode of knowledge “involves an analysis into discrete elements sequentially (inferentially) linked. (...) Thus, intuition is connected with a change in consciousness, and moreover in a way which can be made quite precise and not just left vague” (Bartoft, 1996, p.67).

Moreover, I cannot present empirical results that my respondents experienced presencing because language itself operates through an analytical mode and therefore there are limits to convey *experiential concepts* such as presencing. Nevertheless, by referring to Scharmer’s Theory U (2007) and Senge et al. (2005), I can state that my respondent change-agents’ observation skills and capacities lead me to recognize their capability for presencing.

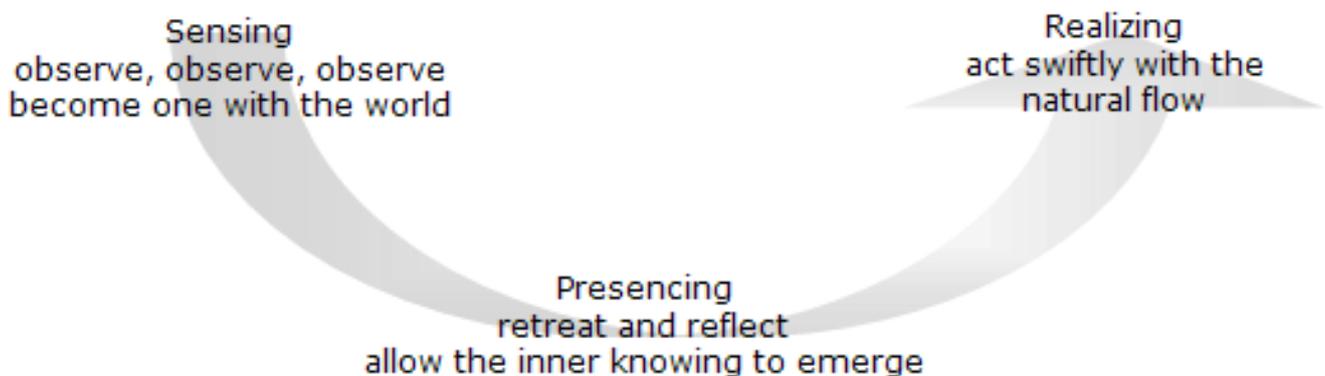
The process of bricolage needs recombining of the resources at hand in order to innovate, generate novelty and address the complex problem in a new way (Hahn et al., 2006; Olsson et al., 2007). To achieve this, change-agents, who take the role of bricoleurs, need to have intimate knowledge of resources and engage in careful observation and listening (Weick, 1993). My results present two specific skills and two underlying capacities regarding engaging in careful observation and listening. I also suggested three major PEBs that change-agents hold as a meta-cognitive capacity. This meta-cognitive capacity is seen as a part of thought-level, interior conditions of change-agents that influence their actions, cognitive processes and transformational leadership behaviors (Bromme et al., 2009; Tickle et al., 2005). Here, I demonstrated that the three PEBs enhance the quality of observation skills by influencing two underlying capacities of suspension and redirection which are fundamentally cognitive processes. Three PEBs, the observation skills and two capacities drive, enable and create space for the change-agents’ flexible learning process. Therefore, all together, these results are suggested as important components of change-agents’ adaptive capacity in relation to their involvement in the bricolage process. Furthermore, these components of the adaptive capacity, especially two observation capacities, lead us to recognize change-agents’ capability for presencing which “blends the two words presence, the now, and sensing, the capacity to detect what is to come, to sense with your heart” (Scharmer, 2010, p.6). Presencing means “to sense an emerging future possibility” (ibid, p.6) and to learn from the future as it emerges (Senge et al., 2005).

In the next section, I will continue my analysis with a theoretical and conceptual discussion of presencing. This further discussion is important regarding two points. First, I will continue my exploration of the adaptive capacity of change-agents as I see presencing as particularly important for the bricolage system since it leads individuals to novel knowledge creation for innovation (Scharmer, 2000b). Second, by defining presencing as learning from the emerging future, I will further improve Fazey et al.’s (2005) flexible learning model which is based on reflecting on the experiences of the past.

### 4.3 Presencing: Embodying, Knowing and Enacting the Observation

Prior to allowing inner knowledge to emerge through presencing, there is a need for deeper levels of observation through sensing and listening (Senge et al., 2005). This deeper level of observation refers to “immersing yourself in the reality of the situation until ultimately you become one with the situation” (ibid, p.88). In his theoretical framework and methodology called Theory U, Scharmer (2007, 2010) explains that deeper levels of observation and sensing, including the capacities of suspension and redirection, are needed for presencing; in other words, accessing the source from where inner knowing about the emerging future flourishes. Scharmer (2007) suggests the U Process as a methodology to access this deeper source of creativity and knowing which he calls presencing (Scharmer, 2010). The most basic scheme of the U Process can be seen at figure 1 (for more detailed schemes, see Appendix II). He calls this process U because it follows three major movements through the shape of U (ibid). The first movement (moving down the left side of the U) is about suspending judgment and old mental models, redirecting your attention to the places of most potential, and immersing yourself in the environment in the system while listening with mind and heart open (ibid). The second (at the bottom of the U) is related to connecting to the source of knowing and self-knowing, and allowing inspirational and intuitive knowledge to emerge (ibid). Finally, the third movement (moving up the right side) is about acting in the now “by prototyping the new in order to explore the future by doing” (Scharmer, 2007, p.5). Scharmer (2010) sees presencing and the U Process as a crucial capacity for today’s transformational leaders who work to address the world’s complex challenges because presencing employs an important leadership technology which is the emerging Self, the leader’s highest future possibility. He assumes that each human being is not one but two; “one is the current self which exists as the result of our past journey; the other one is the Self, the self that we can become as the result of our future journey. Presencing is the process of the (current) self and the (emerging) Self listening to each other.” (ibid, p.7).

Figure 1: The Simplified Model of U Process (Senge et al., 2005, p.88)

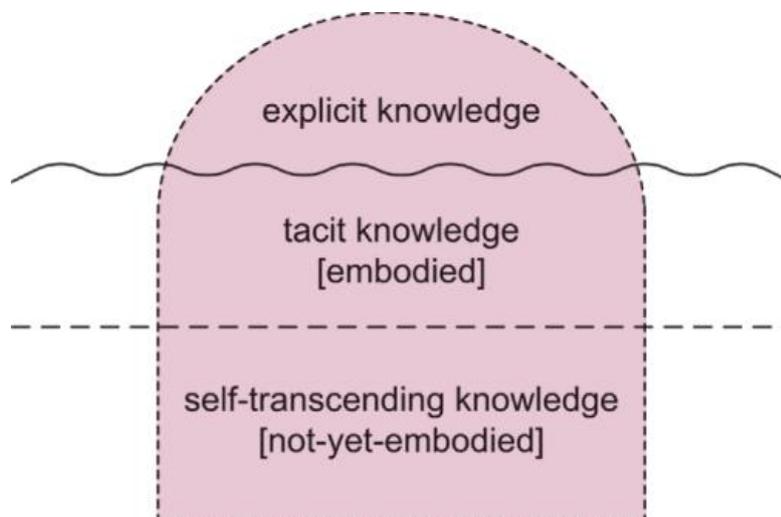


Source: Adapted from Senge, Scharmer, Jaworski, and Flowers (2005:88)

Scharmer (2000b) further claims that presencing and the U Process are significant for change-agents because they enable individuals to tap into the sources of not-yet-embodied knowledge or self-transcending knowledge, which he considers as “a new type of knowledge that allows individuals to sense, tune into and actualize emerging opportunities” (ibid, abstract). He suggests self-transcending knowledge as the third form of knowledge, following explicit knowledge and tacit (embodied) knowledge; figure 2 represents the three forms of knowledge through an iceberg (ibid). He claims this differentiation among various forms of knowledge is relevant because they are based on different epistemological assumptions (see appendix III for related tables) (ibid). Explicit knowledge captures knowledge about things and the reference point for data is observed external reality (ibid). Tacit-embodied knowledge holds the knowledge about things we do and enacted reality is the reference point for data (ibid). Scharmer claims that “capturing this type of knowledge requires reflection-on-action, reflecting on one’s actions” (2000b, p.12). Tacit knowledge sees knowledge as not a thing but a process and it develops in a dynamic knowledge spiral, as it cycles between explicit and tacit forms of knowledge (ibid). This is related to double-loop learning and thus, to Fazey et al.’s (2005) model of flexible learning which is based on the reflection on action.

Nevertheless, Scharmer explains that “not-yet-embodied knowledge captures knowledge about the sources or inner place from where thought and action come into being; here the focus is on the primary ground from which human action arises in the first place” (Scharmer, 2000b, p.12). In order to capture this knowledge, reflection-in-action is needed.

Figure 2: Three Forms of Knowledge (Scharmer, 2000b, p.6)



Scharmer further explains the relations among these knowledge forms through the example of a loaf of bread; “certain kinds of information about bread--like its weight, price, and ingredients--are examples of explicit knowledge. The activities of baking and producing the bread are examples of tacit knowledge (Nonaka and Takeuchi, 1995), and the knowledge that enables a particular baker to invent baking bread in the first place is an example of not-yet embodied knowledge. This “self-transcending knowledge” is tacit knowledge prior to its embodiment in day-to-day practices.” (Scharmer, 2000b, p.5).

In order to demonstrate the importance of presencing and self-transcending knowledge for the adaptive capacity of change-agents and the process of bricolage, an analytical synthesis of these concepts, by referring back to the theoretical framework, is needed. Explicit

knowledge relates to the reality that it indicates from outside and enables the knower to produce statements about the known (Scharmer, 2000b). Explicit knowledge refers to change-agent's knowledge of the bricolage system through knowing and identifying the stakeholders and recognizing various resources at hand as things and facts. Embodied tacit knowledge relates to the reality that it denotes from within and "it enables the knower to produce and bring into existence the known" (ibid, p.13). This knowledge relates to change-agents' all practices as a change-agent or in other words, knowledge of how you be a change-agent. It includes knowing to engage stakeholders that identified through explicit knowledge, listen deeper, communicate, establish networks, and recombine resources and all individual activities around these practices. It is mainly about knowing to facilitate the bricolage process from which novel structures emerge and innovation comes about. The overall adaptive capacity of change-agents enhances the quality of both the observation skills and reflection-on-action process which are essential to capturing and modifying tacit embodied knowledge. For example, they may observe and sense the system to know what is not working in the way they engage stakeholders and modify their knowledge to improve the strategy for engaging.

"Self-transcending knowledge relates to reality both from within and from outside and the locus of the denoted reality is both outside and within the knower." (Scharmer, 2000b, p.13). Scharmer claims that self-transcending knowledge emerges from a *basho* (Nishida, 1987), "a field or shared space that gives rise to the process of enacting tacit knowledge in the first place" (Scharmer, 2000b, p.13). In the bricolage system, this knowledge refers to change-agents' inner source that drives their practices and tacit knowledge processes. It includes the knowledge of why they attempt to engage stakeholders and recombine resources in the first place and how they get to know how they should do these practices. Scharmer (2000b) refers to such knowing as Rosch's concept of primary knowing which, he believes, differs from our standard way of cognition in that it knows "by means of interconnected wholes (rather than isolated contingent parts) and by means of timeless, direct, presentation (rather than through stored re-presentations). Such knowing is 'open, rather than determinate; and a sense of unconditional value, rather than conditional usefulness, is an inherent part of the act of knowing itself. Action from awareness is claimed to be spontaneous, rather than the result of decision making; it gives a room for compassion, since it is based on wholes larger than the self; and it can be shockingly effective.'" (Rosch forthcoming, p. 2, as it is quoted in Scharmer, (2000b, p.15))

Scharmer (2007, 2010) suggests that presencing and the U Process enable individuals to tap into the sources of self-transcending knowledge and primary knowing through observing, sensing and deep reflecting. My results already demonstrated that change-agents have related adaptive capacity which makes them capable of presencing. Presencing and accessing to self-transcending knowledge are particularly important for change-agents who take the role of bricoleurs in bricolage system. By observing and sensing with the quality of their adaptive capacity, change-agents immerse themselves in their environment and know the resources at hand in the bricolage system. Through deep reflection and connecting with the source to make sense of their observation, they can tap into self-transcending knowledge (Scharmer, 2000a, 2007). By doing so, they can sense and actualize opportunities which can possibly emerge from the recombination of various resources in order to innovate and address the complex problem. Then self-transcending knowledge can be embodied as tacit knowledge and enacted by the change-agent.

Self-transcending knowledge is a creative and innovative source for individual change-agents' leadership practice, just like that the concept of bricolage is for the innovation

system. Thus, I would argue that in a sense, we can see presencing as the cognitive process of bricolage for the change-agent. First change-agents observe and sense the system and available resources, and then the potential recombination is sensed, known and actualized as an emerging opportunity. Later, this generated knowledge of conceptual novelty is enacted by the change-agent. All together they can be referred to as recombinatory process of presencing, as recombining ideas and knowledge in their brain. Moreover, I can now include presencing, primary knowing and self-transcending knowledge as concepts to explain the capacity for learning from the future as it emerges (Senge et al., 2005). Thus, the above discussion leads me to recognize an improved version of Fazey et al.'s (2005) model for flexible learning by consisting of both learning by reflecting on the past experiences (double-loop learning) and learning from the future as it emerges which also drives future double-loop learning processes.

#### **4.4 Thesis Rationale Revisited**

Referring to my thesis rationale (section 1.1), I primarily consider sustainability as tuning the organization of human communities with the principles of the organization of ecological communities (Capra, 1987). In the field of sustainability science, resilience theory addresses this domain of sustainability and suggests adaptive management as a tool to achieve sustainability in coupled human-environment systems by using such principles for the re-organization of the system. By simply seeing organization as the whole of relationships among parts that exist in the system (ibid), I suggest that for the adaptive whole, adaptive parts are needed in order to generate relationships that can govern an adaptive system. Then, I raise the question of what are the significant components of individual's adaptive capacity (parts) that are necessary for the adaptive management (whole). Here, Maturana and Varela (1980)'s concept of autopoiesis which is the definition of organization common to all living systems enables me to further demonstrate this relationship; "It is a network of production processes, in which the function of each component is to participate in the production or transformation of other components in the network. In this way, the entire network continually makes itself." (Capra, 1997, p.98). Therefore, when this network is established as an organization for adaptive management to achieve sustainability and resilience, the capacity of each component to participate in the production or transformation of other components, as well as to be produced and transformed is needed; thus the system can function in its natural, authentic synchronicity. The significant components of change-agents' adaptive capacity, that are presented in my results, enable change-agents (component, part) not only to participate in the production and transformation of other components towards the organization's main goal, but also be naturally produced and transformed. By concerning the transformational mode of sustainability science, in order to achieve adaptive management, it is necessary that individuals in the system should develop the necessary adaptive capacity.

## 5. Conclusion

This thesis study considered the transformational mode of sustainability science. It demonstrated the relevance of the study of change-agents for the transformational sustainability science research agenda. Moreover, this study built logical and theoretical linkages between key individuals in adaptive management systems and social entrepreneurs in social innovation systems by identifying both of these groups of actors as change-agents and introducing the unifying concept of bricolage to explain their change-making and transformational leadership practices. Therefore, I attempted to open a doorway for sustainability science to interact with and learn from another field of research where both practical and theoretical knowledge regarding change-making and transformation is also growing (Alvord et al., 2004; Goldstein et al., 2010; Mair & Martı, 2006; Scharmer, 2007; Senge et al., 2005; Yujico, 2008).

Moreover, this study explored the significant components of the change-agents' adaptive capacity which enables them manage different knowledge, perspectives and assumptions of their stakeholders, sense opportunities for innovation, to be flexible learners (Fazey et al., 2007), and adapt to the complex system of bricolage. My main findings included three Personal Epistemological Beliefs (PEBs) which are about holding beliefs in (1) constructed knowledge and uncertainty of knowing, (2) complexity and interconnectedness of knowledge, and (3) continuous process of knowing and tentative knowledge. The three PEBs both drive and enable the change-agents' flexible learning process. In addition, I identified two observation skills that can be seen as means for flexible learning. These skills include ability to sense the whole system and being conscious of the significance of good listening. I further presented two significant capacities of suspension and redirection that enhance the quality of observation skills. My results regarding the skills for observation and two underlying capacities led me to recognize my respondents' capability for presencing that is described as learning from the future as it emerges (Senge et al., 2005). In relation to presencing, the concept of self-transcending knowledge was introduced to explain "a new type of knowledge that allows individuals to sense, tune into and actualize emerging opportunities" (Scharmer, 2000b, abstract). All in all, the three PEBs, two observations skills and two underlying capacities, and presencing are introduced as the significant components change-agents' adaptive capacity.

The significance of the results of this study regarding the transformational mode of sustainability science is twofold. First, I suggest that the components of adaptive capacity are not only relevant to the change-agents, but also for other individuals in the system. Especially in adaptive management, individuals need to develop such adaptive capacity in order to achieve the natural synchronization in the organization of management with the ecosystem principles. Therefore, in the field of sustainability science, there is need for further research to uncover individuals' other relevant leadership and change-agent capacities which may facilitate the system's transition towards the desired state, such as interpersonal communication, problem-solving, decision-making skills, further learning skills, etc.

Secondly, new methodologies in sustainability science research towards more action and the scientist's involvement in the problem-solving process are already considered by some scholars (Wiek, et al., 2012b; Wiek et al., 2011). I believe that it is both appropriate and necessary for sustainability scientist to intervene in the systems by taking the role of change-agents, since they have the improved understanding of the system and awareness of the

possible leverage points. For example, in order to achieve adaptive management, in my further research I may consider to initiate a process to develop adaptive capacity in key actors of the system by organizing workshops and trainings, and conducting a participatory action research. Moreover, as sustainability scientists start to take the roles of change-agents and bricoleurs, my results also become relevant and important for sustainability scientists and should be considered as a part of the necessary key competencies (Wiek et al., 2011). The urgency of the current sustainability challenges calls for sustainability scientists to take the courageous leap, step up to the leadership and be the change-makers.

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# Appendices

## Appendix IA

### Interview Guide:

- Name, Age, Occupation, Nationality, Place ?
- Could you tell me a little about your life and projects as an entrepreneur?
- Where did you get the idea from/ your drive to do it?
- Do you consider yourself as a successful change agent / social entrepreneur? Why/ why not?
- Do you consider yourself an adaptive person?
- Any relationship between your adaptive capacity and your learning skills?
- What makes you a good learner? How? Why?
- In what ways does your engagement with social networks affect your learning capability or improving your learning skills?
- How have you grown as a person since you first started as a social entrepreneur? How have your learning skills evolved (and improved)?
- How do you see yourself adapting to the system that you are involved in?
- What would you give as advice to young social entrepreneurs related to being adaptive and good learners as an element of success in social entrepreneurship?
- Is there anything else you think I should know to understand ..... concepts better?
- Anything you would like to ask me?

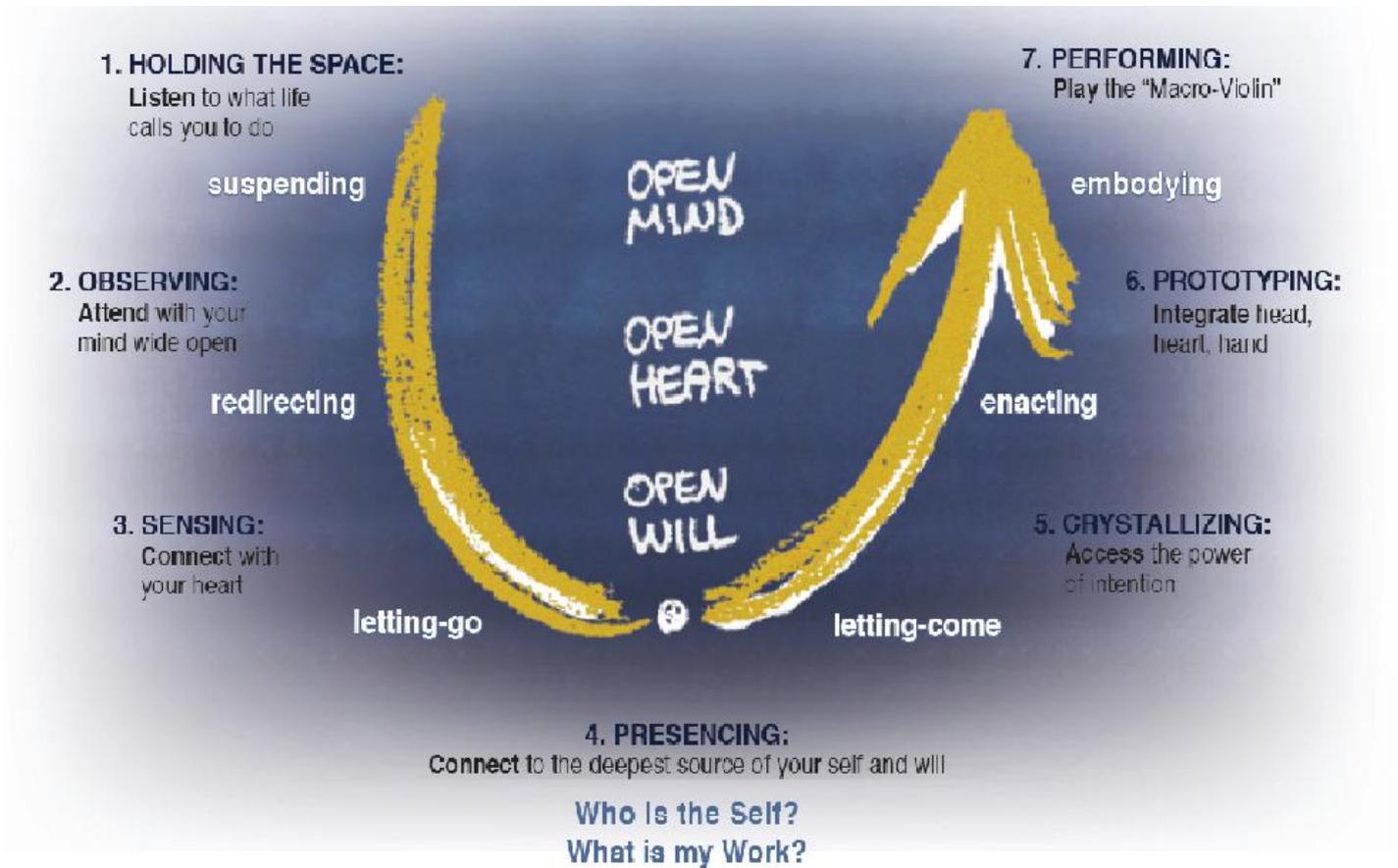
## Appendix IB

### List of Interviewees:

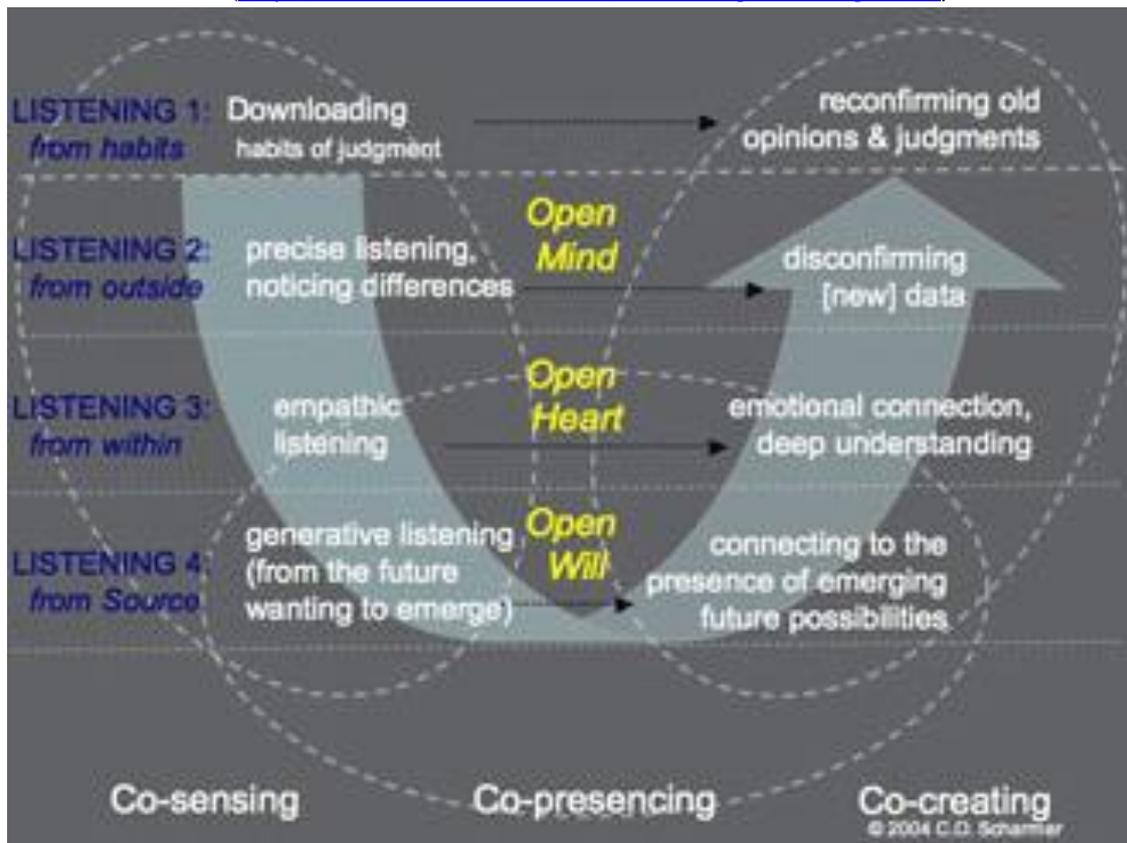
James Halliday – the Hub İstanbul  
Merve Titiz – Design and Innovation for Sustainability  
Tuna Ozcuhadar - Design and Innovation for Sustainability  
Serra Titiz – Mikado Consulting  
Jeremy Allen – Connect One Threads  
Matthias Scheffelmeier – Ashoka Turkey  
Zeynep Meydanoglu – Ashoka Turkey

## Appendix II

Figure 3: Theory U: New Social Technology with Seven Leadership Capacities (Scharmer, 2007)



**Figure 4: Theory U: Process with sensing and listening**  
<http://www.ottoscharmer.com/consulting/coaching.shtml>



### Appendix III

**Figure 5: Different Epistemological Assumptions for Three Forms of Knowledge (Scharmer, 2000b, p.12)**

	K1	K2	K3
Epistemology	Explicit Knowledge	Tacit-Embodied Knowledge	Self-Transcending Knowledge
Type of Knowledge	Knowledge about <i>things</i>	Knowledge about <i>doing</i> things	Knowing about <i>thought-origins</i> for doing things
Data	External reality	Enacted reality	Not-yet-enacted reality
Experience Type	Observation experience	Action experience	Aesthetic experience
Action-Reflection Ratio	Reflection without action	Reflection-on-action	Reflection-in-action
Truth	Matching reality	Producing reality	Presencing reality
Truth Criterion	Can you observe it?	Can you produce it?	Can you presence it?
Perspective	External: View on <i>objective</i> reality	Internal: View on <i>enacted</i> reality	Both internal and external: View on <i>not-yet-enacted</i> reality
Subject-Object Relation	Separation	Unity (after action)	Unity (in action)