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Towards more socially-ecologically innovative regions

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TOWARDS MORE SOCIALLY-ECOLOGICALLY INNOVATIVE REGIONS

CONSIDERATIONS FOR THE FIELD OF SPATIAL PLANNING AND ENVIRONMENT

KARINA CASTRO-ARCE

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Towards more socially-ecologically innovative regions

Considerations for the field of spatial planning and environment

PhD thesis

to obtain the degree of PhD at the
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on the authority of the
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the decision by the College of Deans.

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Tuesday 14 June 2022 at 12.45 hours

by

Karina Castro-Arce

born on 20 September 1978
in San José, Costa Rica

To Alejandro

…because you will build on the legacy of humankind.

"I believe in human ingenuity – that when we decide on a task to be done, no matter how daunting it may seem at the beginning, we are able to unleash human ingenuity and human innovative capacity that was unknown, and takes us to a solution."

Christiana Figueres
Architect of Paris Agreement 2015
Costa Rican

"The prophet is not the one who thinks more cleverly. He is the one who sees more. What he sees is a greater life, a higher humanity, an increase of our share in some of the attributes – especially the attribute of transcendence."

Roberto Mangabeira Unger
Brazilian philosopher

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List of figures and tables

Overview of publications produced as part of this research

Three chapters of this thesis have been published as journal articles.

Chapter 2 has been published as:

Castro-Arce, K., Parra, C., & Vanclay, F. (2019). Social innovation, sustainability and the governance of protected areas: Revealing theory as it plays out in practice in Costa Rica. *Journal of Environmental Planning and Management*, *62*(13), 2255-2272. https://doi.org/10.1080/09640568.2018.1537976

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CHAPTER

1

INTRODUCTION

Introduction to the PhD thesis

A landscape of complexity

As a planner practitioner in Costa Rica, I experienced the difficulties in bridging formal planning and development strategies in a dynamic territory in which social relations and spatial characteristics are varied and changing. Moreover, in places such as my country and its regions, which has the privilege of enjoying almost 5% of the world's biodiversity and plenty of natural resources, decision-making and governance processes are not easy when trying to attain both environmental sustainability and social development. For example, in 2010 the office I was working at, a spatial planning extension programme from the University of Costa Rica, was commissioned by the Municipality of San Carlos to develop regulatory plans for five of its districts, eventually the contract expanded to cover the whole municipality. Some 12 years later, the regulatory plans have still not been approved by the local government due to political tensions, lobbying from sectors, and priorities of local communities. Despite the lack of regulation, in San Carlos, social and spatial development of the territory has not stopped, on the contrary, it's in constant change.

In my professional life, I have witnessed several local, social and place-based initiatives that developed outside the formal planning system, which offered solutions to regional social, economic and environmental needs. Although the groups of people behind these initiatives were actively transforming their social and spatial context, these initiatives are rarely considered in planning practice and in planning as a discipline. Furthermore, these initiatives are often trying to make an impact at the regional level, a level that often does not formally exist, especially in Costa Rica, which only vests two levels of governmentality: national and municipal. Motivated by what I had encountered in practice, I started to seek answers and ways to bridge formal planning practice and local forces in theoretical domains. After my preliminary research, I realized that the gap was not only in practice, but also within science.

Several scholars have pointed-out that, due to the sustainability challenges that regions face today and the need for improvements in their governance systems, the technical-legal logics and the mindset of traditional planning are no longer sufficient or adequate (Healey 2012; Albrechts et al. 2020; de Roo et al. 2020). Traditional planning aspires to create stability by intervening in the current trajectories and to guide them into a model of development that is singular, linear and simple (Healey 2012). This model, inspired by a 'modernisation' myth, structures a pathway in which the end is known and controlled. Such planning practices of deliberate intervention fail to include the dynamic processes of change – and the people involved in them – continuously occurring in regions (de Roo et al. 2020). Environmental challenges, social inequalities, and health threats unceasingly demonstrate that the common ways of doing things, including traditional

planning practice and top-down governance, are untenable if we intend to improve our wellbeing and that of future generations (United Nations 2015; Bai et al. 2016; Masson-Delmotte et al. 2018; Ripple et al. 2019; Fisher et al. 2022). As Albrechts et al. (2020) argued, a proactive response is needed; a response that is capable of coping with the pace of change by taking advantage of transformative practices.

To face social-ecological challenges, regions, or more exactly people within regions, are taking action changing their role from being the object of policies, to becoming active agents who develop their own strategies and co-create policies (Hudson 2007). This process of empowerment requires of new or renewed forms of governance to ensure sustainable regional development. According to Ostrom (2012a), a key issue for development should be that governance processes recognize the complex and intertwined characteristics of the society-nature relationship, by giving the same level of importance to needs of society and nature. Moreover, scholars also argue that human-nature relations have to be better understood in order to overcome social-environmental conflicts and crises (Folke et al. 2005; Lebel et al. 2006; Young et al. 2006; Liu et al. 2007; Ostrom and Cox 2010). In that sense, the governance of intertwined social-ecological interactions places attention on the ways by which society deals with the social-natural conflicts and transformations while satisfying social needs, and, in doing so, develops new social-political arrangements.

Folke et al. (2005) discussed the relevance of the social dimension in the governance of social-ecological interactions, paying special attention to social forms that motivate the renewal and reorganization of the systems. They mentioned that the importance of considering processes of collective action and learning is to view these social dynamics as opportunities for improvement rather than threats to the formal-intuitional practices. They reflect that "it comes as no surprise that knowledge of ecosystem dynamics and associated management practices exists among people of communities that, on a daily basis and over long periods of time, interact their benefit and livelihood with ecosystems" (Folke et al., 2005, p. 445).

In regions and communities struggling with social and/or environmental injustice, the emergence of social practices provides different and more contextualized, socially and spatially embedded ways to satisfy social needs, deal with conflicts arising from human-nature interactions, and alleviate the effects of economic, social or political crises. These practices can be developed to guarantee or to improve social services, rights, ecosystem conservation, land and natural resource use, employment, cultural practices and heritage, social participation in decision-making, etc. These new practices or social innovation initiatives, as transformative practices, could create "new concepts and new ways of thinking that change the way resources are used, (re)distributed, and allocated, and the way the regulatory powers are exercised" (Albrechts 2010, p.1117). According to social innovation literature, specifically about social-ecological relations and territoriality (Moulaert et al. 2005; Moulaert and Nussbaumer 2005; Moulaert 2009; Moulaert and Mehmood 2010; Mehmood and Parra 2013; van Dyck and van den Broeck 2013; Parra and Moulaert 2016; Moulaert et al. 2019; Moulaert and MacCallum 2019; Vercher et al. 2021; Rodríguez Fernández-Blanco et al. 2022), social innovation

initiatives: seek for social-ecological integrated view of development in the satisfaction of individual and collective needs; trigger changes in the territory in the form of social and spatial transformations; foster renewal in governance arrangements and improved practices; promote local empowerment in the governance of their natural resources; promote learning and take advantage of the local know-how; modify the interactions between human and nature in terms of availability (present and future) of the resources, characteristics of environmental services, patterns of consumption; and re-define the social needs.

Drawing from my preliminary research, both in field and the literature, and considering social-ecological challenges and the diverse conflicts and opportunities that contemporary societies face, it is possible to say that scientists and practitioners share common concerns. In particular, that there is the need for an adaptive governance system that exhorts social-ecological regional development through a flexible planning approach and practice that deals with uncertainties, diversity, spontaneity of societal and environmental changes, and their intertwined relations (Skrimizea et al. 2019). As Ostrom affirmed, there is a need to "recognise what ecologists recognised long ago: the complexity of what we study and the necessity of recognising the nonlinear, self-organising, and dynamic aspects as well as the multiple objectives and the spatial and temporal scales involved" (2012b, p.139). And with that recognition, avoid to propose and enact 'one-size-fits-all' solutions "given that these solutions have themselves generated tragedies when widely applied rather than solved them" (2012b, p.139). Considering this, my purpose is to provide knowledge on placed-based initiatives and the pathways they use to develop socio-spatial transformations for a better decision-making about sustainable regional development.

Research aim, objective and questions

This research aims to help in understanding how social innovation, as a proactive response within regions, influences flexible governance processes of social-ecological systems, socio-spatial transformations and sustainable development. By combining theory and practice, the objective is to provide evidence about how governance systems and planning cultures actually 'play out in practice'. I intend to contribute to the scientific debate on how to overcome 'panacea solutions', and instead foster more adaptive planning practices. Ostrom (2012a) urged to look more closely at the specifics of communities, their place-based mechanisms, the governance systems that adapt to the diversity of the social-ecological conditions in which they are immersed; and thus to learn from them. The necessity of doing so is still urgent. For example, Albrechts et al. call on planners "to recognize the situated nature of processes, knowledge and values which guide both urban and regional planning approaches and transformations at the local level. A focus on practices could be helpful to grasp such crucial aspects" (2020, p.2).

The main question that guides this research is: **How can social innovation contribute to spatial transformation and sustainable regional development?**

Responding to this question requires addressing sub-ordinate questions, which are answered across the chapters of this thesis:

- How is social innovation expressed in regional development? How does social innovation shape socio-spatial transformations in the governance of social-ecological interactions?

- Can social innovation contribute to improving the adaptive capacity of a region, and if so, how?

- What can regional planning and social innovation learn from each other, in theory and practice, especially in the governance of social-ecological systems? Does social-ecological systems theory adequately explain a dynamic and dialectic relationship between the two?

- What opportunities and challenges do this ensemble of theories bring to regional development in analysis and practice?

Defining social innovation

The term 'social innovation' was most likely first coined in the XIX century; the publications in which it appeared were hard critics of socialists, so called 'social innovators' (Godin 2012). In his historical review of the concept, Godin commented on how the term was pejorative, because it was confrontational, radical, and revolutionary to the hegemonic social-economic order. Social reformers attempt to improve society "without aspiring to reconstruct it" while social innovators "propose to create society, if not human nature, anew, upon an entirely different basis" (Godin 2012, 17. Citing Anonymous, 1859).

In the first half of the 20th century, the term was being seen differently: social innovation was no longer subversive, but now with the intention of opposing the traditional order, and the social innovator being seen as ingenious and creative, and someone who took ideas into action (Godin 2012). According to Godin, from this point in history, the term gained an ambiguous connotation: anything new in the social realm. In the 1970s, the term had a rebirth amongst social scientists, explaining the concept as, on one hand, a reaction to technological innovation (Anglo-Saxon influence), and on the other hand as social change (French influence).

In the last decade or so, social innovation has become a term globally used, and of much interest to policy makers, practitioners and scientists, who invested the concept with the capacity to improve societal wellbeing (Seyfang and Smith 2007; Murray et al. 2010; Commonwealth of Australia 2011; Moulaert et al. 2013b; BEPA 2014; Presidencia de la República de Colombia 2014; TEPSIE 2014; The White House and United States of America 2015; ANSPE 2016; Mulgan 2016; Moulaert et al. 2017; Parés et al. 2017;

Howaldt et al. 2018; Avelino et al. 2019; Howaldt et al. 2019; Oosterlynck et al. 2020). Nevertheless, social innovation is often pictured as being an ambiguous concept, difficult to define, and applicable to many things (Bock 2012; TEPSIE 2014; Edwards-Schachter and Wallace 2017). One reason for its fuzziness is the diverse research fields in which the concept is being explored, defined and applied, including social entrepreneurship, design, public policy, region and urban development, social movements, welfare and democracy, community development, and more recently, ecology and nature conservation (Mulgan 2007; Edwards-Schachter and Wallace 2017; Oosterlynck et al. 2020; Ziegler et al. 2022). All these approaches have contributed a panoply of epistemologies and methods that had enriched the discussion on social innovation. Nevertheless, despite all the differences, at the core of the concept of social innovation lays normative intentions for procuring a common good for all (Mangabeira Unger 2015; Moulaert et al. 2017).

Considering the questions that guide this research, I have focused on the explorations of social innovation from the perspective of – in and for – socio-spatial development. In this realm, Oosterlynck et al. (2020) divide scholarship into what they have called minimalist and maximalist approaches. Both approaches consider social innovation as a process, although a minimalist approach focuses on social innovation as products for the improvement of society, being a more goal-oriented approach. For example, Mumford (2002) defined social innovation as "the generation and implementation of new ideas about how people should organize interpersonal activities, or social interactions, to meet one or more common goals" (2002, p.253), while Mulgan (2007) was more concrete in indicating that "innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organisations whose primary purposes are social" (2007, p.8). Phills et al. (2008) placed emphasis on the kind of responses needed to attend social demands, defining social innovation as "a novel solution to a social problem that is more effective, efficient, sustainable or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals" (2008, p.11).

A maximalist approach believes that the concept and especially the practice of social innovation can do much more, advocating for the transformational capacity of social innovation. Bellemare and Klein (2011) argued that the solutions to societal problems that social innovation seeks to address come from the implementation of new social and institutional arrangements, and new forms of resource mobilization. Cajaiba-Santana (2014) highlighted that social innovation refers to "new social practices created from collective, intentional, and goal-oriented actions aimed at prompting social change through the reconfiguration of how social goals are accomplished" (2014, p.44). Deepening social innovation to and for social change, Westley et al. (2017) defined social innovation as "a new program, policy, procedure, product, process and/or design that seeks to address a social problem and to ultimately shift resource and authority flows, social routines and cultural values of the social system that created the problem in the first place" (2017, p.4). Haxeltine et al. (2017) intended to move the field forward by defining social innovation – in terms of transformation – "as a process of changing social relations that involves the emergence and spread of new knowledge and practices that challenge, alter or replace the established institutions in a specific context" (2017, p.3).

Following the maximalist approach, this research requires a definition of social innovation that acknowledges territorial expressions, social processes and relations provoking changes and reconfigurations in the social-ecological system and its governance. The definition I developed is informed by the works of Moulaert et al. (2005; 2013a) and Avelino et al. (2017; 2019). I define social innovation as the creation, changes, or transformation in social relations, governance processes, institutions, and political arrangements to satisfy socio-spatial needs and to address social-ecological challenges and crises. In this process, social innovation increases empowerment and improves the social-ecological system.

A social-ecological systems ontology

This research is grounded in a social-ecological systems (SES) perspective aimed at understanding the entangled relations between nature and people. It is especially interested in contextualising the socio-ecological challenges and needs of people, and in the effects of social innovation within regional development. SESs are "intertwined systems of people and nature embedded in the biosphere" (Folke 2016, p.1). The social and the ecological are intertwined in their relations, processes, and dynamics (Castro-Arce et al. 2019), implying that decisions taken for the management of biodiversity and resources and/or for societal development affect the environment, and reciprocally, imbalances in species populations or normal climate and geophysical processes affect communities directly and indirectly. Moreover, as the above definition of SES implies, the interactions, and feedbacks happen across scales, connecting varied spaces and contexts, connecting social-ecological systems (Liu et al. 2007). These feedbacks are vital for the resilience of SESs, but this may not be obvious for communities with urgent needs calling for attention (Mathevet et al. 2016). "However, complex problems demand that knowledge and ideas will need to cross scales" (Moore and Westley 2011, p.5). Summing-up, the connections are multiscalar and multilevel (Cash et al. 2006), the reciprocal feedbacks between and within SESs are uncertain, and there are (un)expected situations that trigger challenges, crises, thresholds, provoking in return the emergence of varied social and ecological responses (Liu et al. 2007), and there is a panoply of institutions, actors, and socio-political processes shaping continuously the human-nature relations (Folke et al. 2005). Therefore, an SES is a complex adaptive system (Folke et al. 2005; Wilkinson 2012). "Complex adaptive systems are not easily analysed or understood, but rather characterized by emergent properties, self-organization, historical patterns of abrupt, non-linear change, and unpredictable dynamics" (Gunderson 2010, p.2).

The SES framework developed and revised by Elinor Ostrom and her colleagues (McGinnis and Ostrom 2014) intends to express the complexity and intertwinedness of an SES. In the framework, although perhaps not explicit, particular attention is placed on the role of society within the SES. Discerning governance systems from actors gives the opportunity to explore each component on its own, and on the processes governance and actors build together. Also, the SES framework unravels the many fuzzy spaces where nature and

people become intertwined system, especially in action situations. Building on McGinnis and Ostrom (2014), action situations are those situations when actors make choices (e.g. about costs and benefits) based on the available information and the choices ahead (probable outcomes). The choices are also determined by the probable actions of other participant actors (internal or external), and the conditions and inputs from the resources and resource systems of the ecosystems (interactions). The framework shows the SES embedded in social, economic and political settings, as well as in related ecosystems – i.e., multiscalar and multilevel relations.

Methodology and research design

For my PhD research, I used case-study research as the overarching methodological strategy. Case-study research is generally adopted whenever the purpose of the research is to explore contextual conditions of a contemporary set of events, over which the researcher has limited to no control (Yin 2009). Case-study research has been widely used in sustainability and environmental research because usually there are blurry boundaries between the events or phenomenon and their context (Evans 2012). This methodological strategy is in tune with my research objective to provide empirical evidence on place-based practices contributing to theory building.

To address the research questions (given earlier), this research explores a region and a national protected area within it – specifically its development trajectories, governance systems, and planning practices –through the experiences of two social innovation initiatives and the relations they forge with other social innovation initiatives. All these are considered case-studies, and are used to elaborate theoretical propositions, linkages, arguments, and constructs out of examining empirical evidence, and confronting it with existing literature (Eisenhardt and Graebner 2007). The thesis as a whole delivers a picture of the region by analysing it as a single case, but at the same time, explores interconnected social initiatives that allow to assess particular phenomena through multiple case-studies. In case-study methodology, the cases are chosen because the researcher expects to find in them the revelations, and explanations of the particular phenomenon of interest (Eisenhardt and Graebner 2007).

This research was situated in Costa Rica for three reasons. First, as made clear earlier, I have been a planning practitioner in Costa Rica for several years, and I am currently a lecturer and researcher at the University of Costa Rica. Therefore, I have sufficient background information about the logics of the governance systems and planning culture. Second, focusing mainly on one region of a country allows a deeper understanding of the spatial relationships of social innovation, adaptive governance and planning practice using SES lens. Third, despite the considerable international recognition Costa Rica has regarding nature conservation, democracy, economic production, wellbeing and so on, it has been under researched in the scholarship of territorial development, socio-spatial transformations, and ecology and society.

The region I chose to study is Huetar-North. This region represents 19% of Costa Rica's land area. Huetar-North is a rural region characterized by its national contribution in terms of energy, water, forestry, and agriculture and livestock production, its varied ecosystems and protected areas, and its reputation for strong social capital (Castro-Arce and Vanclay 2020b; CPCA 2020). The selected social innovation cases discussed in this thesis are as following:

- Chapter two focuses on APANAJUCA as a single case-study. APANAJUCA is an NGO that protects the Juan-Castro-Blanco National Water Park, a protected area that ensures the stability of water supply of the region (Castro-Arce et al. 2019).

- Chapter three analyses ADEZN, also as a single case-study. ADEZN is an NGO that "considers itself to be a territorial development experiment with a mission to promote sustainable regional socio-economic development and wellbeing" (Castro-Arce and Vanclay 2020b). ADEZN's work has an impact on the development of the eight municipalities that encompass the region.

- Chapter four, explores APANAJUCA along with AFAMAAR, another community-based organisation. These two organizations work independently, but share the same goal, the conservation of the Juan Castro Blanco and its natural resources (Castro-Arce and Vanclay 2020a). The paper reflects on the different ways each initiatives uses to contribute to forest protection.

- Finally, chapter five presents a multiple case study, featuring four social initiatives. In this chapter, ADEZN is studied in addition to ZEE-Cartago, ADE-TJ, and ZEE-Osa, which are replicas of ADEZN in other regionsClick or tap here to enter text.. In this chapter, the cases are compared.

The research design had five phases: first, a 'quick-scan' of Costa Rica's regions and known social initiatives; second, a compilation of initial profiles of the selected initiatives; third, a thorough fieldwork; fourth, the subsequent analysis of empirical information and theoretical insights; and fifth, a later follow-up and confirmation of the findings. Case-study research employs a variety of types of data (quantitative and qualitative), data sources and data gathering techniques, and methods for analysis. This is an intrinsic characteristic of this kind of methodological strategy (Eisenhardt and Graebner 2007; Yin 2009). Here, I describe further each of the phases, the techniques used, and the moment in time when it was executed:

- Phase one. 'Quick-scan' of Costa Rica's regions and known social initiatives. The doctorate research started in late 2013, when I moved to live in The Netherlands. In this phase, a sketch of the research questions and research designed was proposed, inspired by the context described earlier in this introduction. An initial theoretical review determined the theories and concepts the thesis was going to use as a basis; especially the concept of social innovation. At first, two regions were under consideration. As a planner practitioner, I had vast experience in both of them, and witnessed the work of several community-based initiatives in each. By the end of this phase, the cases where selected based on the preliminary

theoretical framework, the possible availability of empirical information, and the likelihood of the cases illuminating the research questions.

- Phase two. Assemblage of initial profiles of the selected initiatives. This work was primarily desk-based, although a short two-week fieldwork trip took place in 2014. The desk-based research consisted on a review of available on-line documents and scientific papers, social media platforms, and news platforms. The fieldwork entailed ice-break interviews with some key actors from the selected initiatives. The purpose was to develop knowledge that allowed to design the in-depth fieldwork that was ahead, and initiate snow-ball sampling of actors, initiatives, and activities. During the processes of this phase, an improved research design and research questions were proposed.

- Phase three. Thorough fieldwork. This phase took place in between July and November 2015. The main activities during this period were in-depth semi-structured interviews; participant observation in meetings and events; field recognition in Juan Castro Blanco National Water Park, and of infrastructure development projects in the region; re-visiting Huetar-North territory; and gathering of institutional documents, much of which is only of limited availability. I used the initial findings of phase two to establish general guidelines for the interviews, but allowed participants to express what they considered to be important in the evolution of their history within the initiatives and the history of the initiatives. The fieldwork relied strongly on snow-ball sampling; therefore, I asked the participants to suggest places, people, projects, activities that they considered were important for me to understand better their processes, relations and dynamics. Interestingly, very supportive people and success stories were suggested to me, as well as actors who felt disappointed. A rapid assessment of the interviews and activities help me understand the impact and value of the social initiatives, as well as their weaknesses and threats.

- Phase four. Analysis of empirical information and theoretical insights. This phase started in 2016 and finished in 2021. Most of the interviews conducted in Spanish were audio-recorded (all but four), and extensive notes were taken during all interviews (on an iPad or desktop computer). The notes were reviewed and the recordings revisited. Guided by the research questions, the analysis of the information was done in two ways: an initial coding and memo-ing of emergent concepts and topics found in the field notes, interview notes, and grey literature; and a second coding of broader themes associated with the theoretical framework and the theories that are questioned in this research. In this phase, also an in-depth literature review took place. It is important to disclose that not all notes and information were coded or commented in memos, only those that were considered relevant. Also, only some parts of the interviews were transcribed. When placed in research outputs, the translation into English was not literal, as I considered most important to preserve the sense and meaning of the ideas of the participants. This accuracy, of course, can always be verified by looking again at the original data. The analysis process was an iterative one, a constant confrontation and inquiry within all empirical evidence, and between empirical evidence and scientific literature. My intention was always to be able to draw a

bigger picture on what the combination of theories might produce, to be open as much as possible to variables, ideas, and findings, and to prompt theoretical discussions were insights could emerge. Theorization and developing theoretical constructs through an iterative process is one of the strengths of case-study research methodology (Flyvbjerg 2006; Eisenhardt and Graebner 2007; Yin 2009).

- Phase five. Follow-up and confirmation of the findings. This phase took place between 2018 and 2021. By the end of 2018, I moved back to Costa Rica, which facilitated the follow-up of the cases. During this time, I re-interviewed some of the key participants to corroborate some facts, and to find out about the last developments. Unfortunately, the writing up of the research was delayed because of Covid-19 pandemic. This phase is the phase of storytelling, and testing if the theoretical constructs built out from empirical evidence and theory were consistent, and persisted during the time of the research. The story of each of the cases, and of the Huetar-North region became intertwined with the theoretical discussions each of the chapters offer.

In total, for this research six socially innovative initiatives were investigated through: 87 interviews; participant observation in 13 meetings; attending, via personal invitation, at two congresses, one national and the other international, where policy-makers and practitioners gathered; exploration and observation the context through five fieldtrips; and follow-up of the activities of the social innovation initiatives via constant checking of their Facebook webpages. Formal informed consent was obtained for all interviews, anonymity was guaranteed for all participants, and other principles of social research ethics were observed (Vanclay et al. 2013).

Research contribution and thesis outline

The research presented in this PhD thesis intended to do cross-pollination of theories, and of practices and theories, informing one and the other, and enriching one and the other. It examines social innovation, regional development and regional environmental governance using SES theory as a way of understanding the world. This research studies regions, their development pathways, and the ways relations and decisions for development (governance) are built, by questioning the role of social innovation in each of them. Through the exchanges between the empirical data and literature, this research provides new theoretical insights, analytical frameworks, and evidence on the local and regional governance and planning practices. It offers a methodological approach that through its research methods and data gathering techniques provokes iteration between theoretical constructs and empirical evidence bringing sufficient research validity, allowing confident results in the examination of the intertwined relations of society and nature. Above all, this research makes a plea for a more socially-ecologically innovative regional development.

Together with this Introduction and a Conclusion, this PhD thesis consists of other four chapters in which the main research question and the subordinate questions are addressed. Conclusions of the research are given in a final chapter, in which the research question is answered, and demonstrated that the objective and aim of the research are both satisfied. In the Conclusion, the major issues left unstudied are discussed as well as what else I suggest should be discussed. Finally, I highlight the importance of the results of this thesis for both theory and practice, and in particular to the field of spatial planning and environment. Next, I will summarize each of the other chapters.

In chapter two, I explore the concept of social innovation and examine if the theoretical propositions offered by scholarship are consistent on how social innovation is manifested in practice. I do so, through a discussion on protected areas (PAs) as SESs and as contested spaces. The challenges in governing PAs call for a governance system that works with human-nature relations and is capable of adapting to each PA. I argue that this necessitates innovative processes and adaptive governance. This chapter contributes to the discussion on adaptive governance in SES by offering empirical evidence from Costa Rica of how the processes of social innovation occur in practice. In particular, I discuss the evolving governance of the Juan Castro Blanco National Water Park, focusing on the contribution of APANAJUCA, a local association that drives conservation and management of the park. I explain that social mobilization arose social innovation, which was revealed by the achievement of three interconnected process outcomes: satisfaction of interests; effective socio-political arrangements; and empowerment. I show that the socially-innovative governance of the park has contributed to sustainability and to social-ecological change at many levels.

In chapter three, I use a rural setting to provide and test an analytical framework for understanding how social innovation develops transformative capacity. I argue that the interactions between bottom-up initiatives and top-down structures in the implementation of regional development policies and projects are complex in theoretical and practical terms. Using concepts such as transformative social innovation, adaptive governance, and bridging institutions, I developed the analytical framework deepening into the processes by which local top-down and bottom-up forces enhance sustainable rural development. I reveal that this is possible through co-developing bottom-linked governance. Bottom-linked governance is a multi-level middle ground where actors from various political levels, geographical scales and industry sectors come together to share decision-making. Social innovation has the potential to be transformative, but to do this, it has to be able to scale-up and provoke changes in the governance system. Using a social innovation initiative, APANAJUCA case, I tested the framework and considered the enabling factors of bottom-linked governance. These comprise the various bridging roles the initiative must play: network enabler; knowledge broker; resource broker; transparency and conflict resolution agent; and shared vision champion. I also considered the critical success factors of bottom-linked governance. I show that bottom-linked governance and social innovation together comprise how planning practice contributes to social-ecological regional development. Sharing of power and participatory decision-making facilitate more flexible, inclusive and effective planning. I demonstrate that the analytical framework was helpful in understanding how a social innovation initiative

fostered transformation and contributed to sustainable rural development.

In chapter four, I explore further how social innovation contributes to improve the adaptive capacity of a region. I do so through a discussion on green land acquisition and environmental protection. Land acquisition often involves power and displacement, and can be carried out on a large scale. There are many forms of land acquisition, including for environmental and conservation purposes, as well as for production activities. While green grabbing has joined land grabbing as an environmental justice issue of concern, it is not necessarily the case that all green land acquisition is large scale, done by powerful outsiders, or leads to displacement and exclusion. The outcomes of green land acquisition are dependent on the mechanisms used, the adequacy of resettlement and/or compensation, and the social and environmental context in which it happens. I discuss the outcomes of community-led land acquisition for conservation purposes in Costa Rica. In this chapter, I use APANAJUCA and AFAMAAR cases as champions defending the forest and water resources of the Juan Castro Blanco National Water Park. This chapter informs environmental planning and environmental governance by bringing in aspects of green land acquisition that have not been previously explored.

In chapter five, I argue that social innovation in and for social-ecologically sustainable regional development is an informal planning practice that should be recognised in the planning system. I discuss how social innovation promotes more adaptive governance and flexible planning practice. As an important dynamic that not only influences but also fosters regional transformation, there is much interest from policy makers and academics about the spread and replication of social innovation. Through a comparative case study, using ADEZN, ZEE-CARTAGO, ADE-TJ, and ZEE-OSA cases, I analyse these social innovation initiatives in respect of the replication possibility for social innovation. I consider what elements and processes these cases have in common. I explore if the replication was successful in terms of survival of the initiative, accomplishment of goals, and social-ecological transformative potential. The analysis shows that social innovation is not a formula that can be replicated indiscriminately without considering local social-ecological characteristics. There is no one-size-fits-all. Nevertheless, the research provides evidence that socially innovative initiatives can be reproduced, but arguably there is less transformative potential of its offspring. I conclude by offering some general reflexions on the uniqueness of social innovation as territorial expressions; hence, informal planning practices that are intrinsic to each planning system.

References

Albrechts, L. 2010. More of the same is not enough! How could strategic spatial planning be instrumental in dealing with the challenges ahead? *Environment and Planning B: Planning and Design* 37(6), pp. 1115–1127.

Albrechts, L., Barbanente, A. and Monno, V. 2020. Practicing transformative planning: The territory-landscape plan as a catalyst for change. *City, Territory and Architecture* 7(1), p. 1.

ANSPE 2016. *Nodo nacional de innovación social*. Available at http://mapasocial.dps. gov.co/organizaciones/2

Avelino, F. et al. 2019. Transformative social innovation and (dis)empowerment. *Technological Forecasting and Social Change* 145, pp. 195-206.

Avelino, F., Wittmayer, J.M., Kemp, R. and Haxeltine, A. 2017. Game-changers and transformative social innovation. *Ecology and Society* 22(4), p. art41.

Bai, X. et al. 2016. Plausible and desirable futures in the Anthropocene: A new research agenda. *Global Environmental Change* 39, pp. 351–362.

Bellemare, G. and Klein, J.-L. 2011. La question territoriale des pratiques sociales, des pratiques scientifiques et des savoirs. In: Bellemare, G. and Klein, J.-L. eds. *Innovation Sociale et Territoire Convergences Théoriques et Pratiques*. Québec: Presses de l'Université du Québec, pp. 1–16.

BEPA 2014. *Social innovation. A decade of changes*. Luxemburg: Publications Office of the European Commission.

Bock, B. 2012. Social innovation and sustainability. How to disentangle the buzzword and its application in the field of agriculture and rural development. *Studies in Agricultural Economics* 114(2), pp. 57–63.

Cajaiba-Santana, G. 2014. Social innovation: Moving the field forward. A conceptual framework. *Technological Forecasting and Social Change* 82, pp. 42–51.

Cash, D.W. et al. 2006. Scale and cross-scale dynamics: Governance and information in a multilevel world. *Ecology and Society* 11(2), p. 8.

Castro-Arce, K., Parra, C. and Vanclay, F. 2019. Social innovation, sustainability and the governance of protected areas: Revealing theory as it plays out in practice in Costa Rica. *Journal of Environmental Planning and Management*, 62(13), pp. 2255–2272.

Castro-Arce, K. and Vanclay, F. 2020a. Community-led green land acquisition: Social innovative initiatives for forest protection and regional development. *Land* 9(4), p. 109.

Castro-Arce, K. and Vanclay, F. 2020b. Transformative social innovation for sustainable rural development: An analytical framework to assist community-based initiatives. *Journal of Rural Studies* 74, pp. 45–54.

Commonwealth of Australia 2011. *Government initiatives that support social innovation and entrepreneurship*. Canberra.

CPCA 2020. *Estudio del estado de situación del sector cooperativo autogestionario costarricense*. Available at www.cpca.coop

de Roo, G., Rauws, W. and Zuidema, C. 2020. Adaptive planning and the capacity to perform in moments of change. *Handbook on Planning and Complexity*, pp. 85–109.

Edwards-Schachter, M. and Wallace, M.L. 2017. 'Shaken, but not stirred': Sixty years of defining social innovation. *Technological Forecasting and Social Change* 119, pp. 64–79.

Eisenhardt, K.M. and Graebner, M.E. 2007. Theory building from cases: Opportunities and challenges. *Academy of Management Journal* 50(1), pp. 25–32.

Evans, R. 2012. Case study method in sustainability research. In: Franklin, A. and Blyton, P. eds. *Researching sustainability. A guide to social science, methods, practice and engagement*. Oxon, New York: Earthscan, pp. 54–70.

Fisher, E., Brondizio, E. and Boyd, E. 2022. Critical social science perspectives on transformations to sustainability. *Current Opinion in Environmental Sustainability* 55, p.1010160.

Flyvbjerg, B. 2006. Five misunderstandings about case-study research. *Qualitative Inquiry* 12(2), pp. 219–245.

Folke, C. 2016. Resilience (Republished). *Ecology and Society* 21(4), art44.

Folke, C., Hahn, T., Olsson, P. and Norberg, J. 2005. Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources* 30(1), pp. 441–473.

Godin, B. 2012. Social innovation: Utopias of innovation from c.1830 to the present. *Project on the Intellectual History of Innovation* Working Paper No. 11.

Gunderson, L. 2010. Ecological and human community resilience in response to natural disasters. *Ecology and Society*. 15(2), art18.

Haxeltine, A., Pel, B., Wittmayer, J., Dumitru, A., Kemp, R., and Avelino, F. 2017. Building a middle-range theory of transformative social innovation. Theoretical pitfalls and methodological responses. *European Public & Social Innovation Review (EPSIR)* 2(1), pp. 1–19.

Healey, P. 2012. The universal and the contingent: Some reflections on the transnational flow of planning ideas and practices. *Planning Theory* 11(2), pp. 188–207.

Howaldt, J., Kaletka, C., Schröder, A. and Zirngiebl, M. eds. 2018. *Atlas of social innovation – New practices for a better future*. Dortmund: Sozialforschungsstelle, TU Dortmund University.

Howaldt, J., Kaletka, C., Schröder, A. and Zirngiebl, M. eds. 2019. *Atlas of social innovation - A world of new practices*. Oekom.

Hudson, R. 2007. Regions and regional uneven development forever? Some reflective comments upon theory and practice. *Regional Studies* 41(9), pp. 1149–1160.

Lebel, L., Anderies, J.M., Campbell, B., Folke, C., Hatfield-Dodds, S., Hughes, T.P. and Wilson, J. 2006. Governance and the capacity to manage resilience in regional social-ecological systems. *Ecology and Society* 11(1), art19.

Liu, J. et al. 2007. Complexity of coupled human and natural systems. *Science* 317(5844), pp. 1513–6.

Mangabeira Unger, R. 2015. Conclusion: The task of the social innovation movement. In: Nicholls, A., Simon, J., and Gabriel, M. eds. *New Frontiers in Social Innovation Research*. London: Palgrave Macmillan UK, pp. 233–251.

Masson-Delmotte, V. et al. 2018. *Global warming of 1.5°C An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. Available at www.environmentalgraphiti.org

Mathevet, R., Thompson, J.D., Folke, C. and Chapin, F.S. 2016. Protected areas and their surrounding territory: Socioecological systems in the context of ecological solidarity. *Ecological Applications* 26(1), pp. 5–16.

McGinnis, M.D. and Ostrom, E. 2014. Social-ecological system framework: Initial changes and continuing challenges. *Ecology and Society* 19(2), art30.

Mehmood, A. and Parra, C. 2013. Social innovation in an unsustainable world. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook of Social Innovation Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 53–66.

Moore, M.L. and Westley, F. 2011. Surmountable chasms: Networks and social innovation for resilient systems. *Ecology and Society* 16(1), art5.

Moulaert, F. 2009. Social innovation: Institutionally embedded, territorially (re) produced. In: MacCallum, D., Moulaert, F., Hillier, J., and Vicari, S. eds. *Social innovation and territorial development*. UK: Ashgate Publishing Company, pp. 11–23.

Moulaert, F. and MacCallum, D. 2019. *Advanced introduction to social innovation*. Edward Elgar Publishing.

Moulaert, F., MacCallum, D., Mehmood, A. and Hamdouch, A. 2013a. General introduction: The return of social innovation as a scientific concept and a social practice. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook of Social Innovation Collective Action, Social Learning and Transdisciplinary Research.* Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 1-6.

Moulaert, F., MacCallum, D., Mehmood, A. and Hamdouch, A. eds. 2013b. *The International Handbook of Social Innovation Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar Publishing Inc.

Moulaert, F., MacCallum, D., van den Broeck, P. and Garcia, M. 2019. Bottom-linked governance and socially innovative political transformation. In: Howaldt, J., Kaletka, C., Schröder, A., and Zirngiebl, M. eds. *Atlas of Social Innovation - A World of New Practices*. OEKOM, pp. 63–66.

Moulaert, F., Martinelli, F., Swyngedouw, E. and Gonzalez, S. 2005. Towards alternative model(s) of local innovation. *Urban Studies* 42(11), pp. 1969–1990.

Moulaert, F. and Mehmood, A. 2010. Spaces of social innovation. In: Pike, A., Rodríguez-Pose, A., and Tomaney, J. eds. *Handbook of Local and Regional Development*. London, UK: Routledge, pp. 212–225.

Moulaert, F., Mehmood, A., MacCallum, D. and Leubolt, B. 2017. *Social innovation as a trigger for transformations -the role of research*. Luxembourg.

Moulaert, F. and Nussbaumer, J. 2005. The social region: Beyond the territorial dynamics of the learning economy. *European Urban and Regional Studies* 12(1), pp. 45–64.

Mulgan, G. 2007. *Social Innovation: What it is, why it matters and how it can be accelerated*. London: The Young Foundation.

Mulgan, G. 2016. The study of social innovation - Theory, practice and progress. In: Nicholls, A., Simon, J., and Gabriel, M. eds. *New Frontiers in Social Innovation Research*. Hampshire & New York: Palgrave Macmillan, pp. x–ix.

Mumford, M.D. 2002. Social innovation: Ten cases from Benjamin Franklin. *Creativity Research Journal* 14(2), pp. 253–266.

Murray, R., Caulier-Grice, J. and Mulgan, G. 2010. *The open book of social innovation*. UK: The Young Foundation, NESTA.

Oosterlynck, S., Novy, A. and Kazepov, Y. eds. 2020. *Local social innovation to combat poverty and exclusion. A critical appraisal*. Policy Press.

Ostrom, E. 2012a. The future of the commons: Beyond market failure and government regulation. In: Ostrom, E., Chang, C., Pennington, M., and Tarko, V. eds. *The future of the commons Beyond market failure and government regulation*. London: The Institute of Economic Affairs, pp. 68–83.

Ostrom, E. 2012b. Why do we need to protect institutional diversity? *European Political Science* 11(1), pp. 128–147.

Ostrom, E. and Cox, M. 2010. Moving beyond panaceas: A multi-tiered diagnostic approach for social-ecological analysis. *Environmental Conservation* 37(04), pp. 451–463.

Parés, M., Ospina, S. and Subirats, J. 2017. *Social innovation and democratic leadership*. Edward Elgar Publishing.

Parra, C. and Moulaert, F. 2016. The governance of the nature-culture nexus: Lessons learned from the San Pedro de Atacama case-study. *Nature+Culture* 11(3), pp. 239–258.

Phills, J., Deiglmeier, K., Miller, D.T.D. and Phills Jr., J.A. 2008. Rediscovering social innovation. *Stanford Social Innovation Review* 6(4), pp. 34–43.

Presidencia de la República de Colombia 2014. *Innovación social creada por jóvenes - ISxJ*. Available at wsp.presidencia.gov.co/ColombiaJoven/estrategias/Paginas/isxj.aspx

Ripple, W.J., Wolf, C., Newsome, T.M., Barnard, P. and Moomaw, W.R. 2019. World Scientists' Warning of a Climate Emergency. *BioScience* 70(1).

Rodríguez Fernández-Blanco, C., Górriz-Mifsud, E., Prokofieva, I., Muys, B. and Novoa, C.P. 2022. Blazing the trail: Social innovation supporting wildfire-resilient territories in Catalonia (Spain). *Forest Policy and Economics* 138.

Seyfang, G. and Smith, A. 2007. Grassroots innovations for sustainable development: Towards a new research and policy agenda. *Environmental Politics* 16(4), pp. 584–603.

Skrimizea, E., Haniotou, H. and Parra, C. 2019. On the 'complexity turn' in planning: An adaptive rationale to navigate spaces and times of uncertainty. *Planning Theory* 18(1), pp. 122–142.

TEPSIE 2014. *Social Innovation Theory and Research: A guide for researchers*. Brussels.

The White House and United States of America 2015. *Office of social innovation and civic participation*. Available at https://obamawhitehouse.archives.gov/administration/eop/sicp

United Nations 2015. *Transforming our world: The 2030 agenda for sustainable development*.

van Dyck, B. and van den Broeck, P. 2013. Social innovation: A territorial process. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 131–141.

Vanclay, F., Baines, J.T. and Taylor, C.N. 2013. Principles for ethical research involving humans: Ethical professional practice in impact assessment Part I. *Impact Assessment and Project Appraisal* 31(4), pp. 243–253.

Vercher, N., Barlagne, C., Hewitt, R., Nijnik, M. and Esparcia, J. 2021. Whose narrative is it anyway? Narratives of social innovation in rural areas – A comparative analysis of community-led initiatives in Scotland and Spain. *Sociologia Ruralis* 61(1), pp. 163–189.

Westley, F., McGowan, K. and Tjörnbo, O. 2017. *The evolution of social innovation*. Westley, F., McGowan, K., and Tjörnbo, O. eds. Edward Elgar Publishing.

Wilkinson, C. 2012. Social-ecological resilience: Insights and issues for planning theory. *Planning Theory* 11(2), pp. 148–169.

Yin, R.K. 2009. Case study research: design and methods. In *Applied social research methods series* 5. London, UK: Sage Publications.

Young, O.R., Berkhout, F., Gallopin, G.C., Janssen, M.A., Ostrom, E. and van der Leeuw, S. 2006. The globalization of socio-ecological systems: An agenda for scientific research. *Global Environmental Change* 16(3), pp. 304–316.

Ziegler, R., Balzac-Arroyo, J., Hölsgens, R., Holzgreve, S., Lyon, F., Spangenberg, J.H. and Thapa, P.P. 2022. Social innovation for biodiversity: A literature review and research challenges. *Ecological Economics* 193 (107336).

CHAPTER 2

SOCIAL INNOVATION, SUSTAINABILITY AND THE GOVERNANCE OF PROTECTED AREAS

Abstract

Protected areas (PAs) are social-ecological systems (SES) and are contested spaces. The challenges in governing PAs call for a governance system that works with human-nature relations and is capable of adapting to each PA. This necessitates innovative processes and adaptive governance. This paper contributes to the discussion on adaptive governance in SES by offering empirical evidence from Costa Rica of how the processes of social innovation occur in practice. We discuss the evolving governance of the Juan Castro Blanco National Water Park, particularly the contribution of a local association that drives conservation and management of the park. We show that social mobilization caused social innovation, which was revealed by the achievement of three interconnected process outcomes: satisfaction of interests; effective socio-political arrangements; and empowerment. The socially-innovative governance of the park has contributed to sustainability and to social-ecological change at many levels.

Keywords: social innovation; social-ecological systems; social sustainability; protected area management; common-pool resources.

Social innovation, sustainability and the governance of protected areas: revealing theory as it plays out in practice in Costa Rica

Introduction

Costa Rica is well known for its conservation and environmental policies (Steinberg 2001). Its national protected area (PA) system, which includes public and private lands, covers almost 27% of its territory (Kohlmann et al. 2010). The PA system secures not only biodiversity, but also the natural resources used in green energy production, for example almost all volcanoes and aquifers are protected. However, this does not necessarily prevent disputes arising over the use of resources (Kuzdas et al. 2014). Costa Rica's role in biodiversity conservation is particularly important because, in its mere 52,100 square kilometres, it accounts for 4.5% of the world's biodiversity (Obando Acuña 2007). Costa Rica's commitment to environmental management is demonstrated by the fact that 98% of its electricity comes from renewable sources, primarily hydro and geothermal (GOBIERNOCR 2017).

The success of environmental management in Costa Rica is partly because of the activism of NGOs and their participation in the management of PAs (Miller 2006). These socio-political arrangements have been little studied, except for the conservation areas of Arenal-Tempisque (Lober 1992), Guanacaste (Basurto and Jiménez-Pérez 2013; Pringle 2017) and La Amistad-Caribe (Kitamura and Clapp 2013; Molina Murillo et al. 2014).

PAs are typically contested spaces (Brockington et al. 2008; Dudley et al. 2014; Borrini-Feyerabend and Hill 2015). There is on-going debate about the reasons justifying the creation of PAs, revolving around whether PAs should be safeguarded for their intrinsic values or their instrumental values (Doak et al. 2014; Tallis and Lubchenco 2014). The discussion also considers the impacts of PAs on local communities (Vanclay 2017), as well as the effectiveness of the conservation strategy with or without local support (Berkes 2004; Hanna et al. 2008; Holmes 2013; Watson et al. 2014; Birnbaum 2016). At the core of these discussions are human-nature relations and their tensions, and recognition of the need for a governance system that works with social-ecological intertwinedness and is capable of adapting to the particular conditions of each PA (Borrini-Feyerabend and Hill 2015; Parra and Moulaert 2016). For Ostrom (2012) one of the challenges in achieving sustainability is to overcome the panacea problem, the idea that there is a universal solution to the tragedy of the commons. To overcome this problem demands that we understand how governance systems actually work in practice and how they can be re-designed to suit a diversity of social and ecological conditions.

We use a social innovation perspective to explore the governance system of the Juan-Castro-Blanco National Water Park in the middle of Costa Rica. We are interested in how social innovation influenced governance processes that lead to social and ecological transformations (Mehmood and Parra 2013). We define social innovation as changes in social relations, political arrangements and/or governance processes that lead to improvement in a social system. Social innovation is underexplored in the PA literature, although Biggs et al. (Biggs et al. 2010) used the concept to provide a pilot assessment on the necessary transformations in ecosystem management.

Juan-Castro-Blanco came into being as a result of community interest and the support of local government. It provides water to approximately 150 communities and 10 hydropower projects, and plays an important role in the conservation of vulnerable endemic biodiversity, e.g. the frog *Lithobates vibicarius* and the trees, *Nectandra smithii* and *Oreomunnea pterocarpa* (SINAC 2012). The governance of the Juan-Castro-Blanco is a mix of public, private and community-based mechanisms that contribute to regional sustainable development by protecting forests, biodiversity and freshwater, while allowing various social entities to benefit from innovative arrangements. With our analysis of the Juan-Castro-Blanco National Water Park, we describe the governance of a social-ecological system (SES) that is more than just adaptive – it demonstrates proactivity, socially innovation, and transformative potential.

We draw on insights from three fields: the literature on PA governance (Hayes and Ostrom 2005; Hanna et al. 2008; Borrini-Feyerabend and Hill 2015; Mathevet et al. 2016); SES governance (Liu et al. 2007; Brondizio et al. 2009; Schultz et al. 2015); and social innovation (Mehmood and Parra 2013; Moulaert et al. 2013a; Parra 2013). Using a case study (i.e. the Juan-Castro-Blanco), we reveal how social innovation can encourage more proactive governance of protected areas, and we describe the process outcomes that arise from social innovation, specifically the satisfaction of interests, changes to socio-political arrangements, and empowerment (Moulaert 2009). We present a synthesis of how these process outcomes were achieved in the governance of the Juan-Castro-Blanco. We discuss the relevance of social innovation for PA governance and conclude by highlighting how social innovation can be fostered to improve sustainable regional development and social-ecological change.

The governance of protected areas, social-ecological systems and social innovation

The governance of protected areas

A PA is "a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley 2008, p.60). The way a PA comes into being and how its status is enforced influences how effective it is as

a conservation strategy (Hanna et al. 2008). In terms of purpose, level of protection, and land ownership, the types of PA vary from country to country and have been changing over time (Dudley et al. 2014). Although once having a very strict protectionist philosophy, the International Union for Conservation of Nature (IUCN) now allows a degree of resource use by local communities and other actors (Francis 2008; Dudley et al. 2010). Nevertheless, transformation in the governance of PAs is still a challenge (Moore and Tjornbo 2012; Mathevet et al. 2016; Pringle 2017). Finding better ways of governing biodiversity and natural resources occupies the science and practice of PA management.

Typically, in the past although less so in the present, the governance of PAs was top-down, with a public institution in charge, sometimes inviting NGOs representing local communities to participate (Borrini-Feyerabend and Hill 2015). When this typical governance structure is challenged by uncommon problems or unconventional arrangements, opportunities for transformation arise (see Borrini-Feyerabend et al. 2013). The scholarship on PA governance recognises that local institutions play a significant role in the success of a PA (Berkes 2004; Hayes and Ostrom 2005; Hanna et al. 2008; Kelboro and Stellmacher 2015; Mathevet et al. 2016). Irrespective of whether a PA is created for its intrinsic or instrumental value, its governance must consider – and be a part of – the social and political arrangements of the communities and organizations affected by the PA (Vanclay 2017). Therefore, a PA will only be successful when its governance is adaptive, responding to the particularities of its social-ecological context, and when it delivers lasting sustainable results for the benefit of local communities and society in general (Ostrom 2012; Borrini-Feyerabend et al. 2013).

Protected areas as social-ecological systems

One way to look at PAs is through the perspective of SES, which denotes how relations between society and nature, and their processes and dynamics, are intertwined (Berkes 2004; Liu et al. 2007; Parra and Moulaert 2016; Cumming and Allen 2017). PAs are a social creation established for the benefit of current and future generations, and seek to protect nature from the pressures of contemporary society. SES is a valuable approach to apply to the analysis of PAs because decisions taken about how to manage biodiversity and natural resources will impact on societal development and, conversely, decisions made for societal development will directly and indirectly affect PAs (Parra and Moulaert 2016; Cumming and Allen 2017).

Scholars highlight that the governance of SES (and PAs) must be adaptive (Francis 2008; Brondizio et al. 2009; Borrini-Feyerabend and Hill 2015; Schultz et al. 2015). Adaptive governance means more than just being flexible, coping with change, or seeking to build resilience (Folke et al. 2005; Armitage et al. 2007; Imperiale and Vanclay 2016), it also requires that the socio-political arrangements governing a SES: (1) actively enable the involvement of different actors (State, local organizations and communities in general); (2) embrace diversity of values, interests, perspectives, and methods of management;

and (3) are able to effectively reconcile conflict amongst actors (drawing on Dietz et al. 2003).

Adaptive governance is inclusive, horizontal and sensitive to the context of the SES, and facilitates collaboration between actors as a way of gathering knowledge from practice (Birnbaum 2016; Bodin et al. 2017). Adaptive governance is expected to help the SES adapt to change and to traverse thresholds (Armitage et al. 2007), not by bouncing back but by bouncing forward (Davoudi 2012; Imperiale and Vanclay 2016).

Social innovation for the governance of social-ecological systems

Social innovation is frequently featured in government policy (Australian Government 2011; OECD 2011; BEPA 2014; Presidencia de la República de Colombia 2014; The White House and United States of America 2015; ANSPE 2016) and academic research (MacCallum et al. 2009; Murray et al. 2010; Nicholls and Murdock 2012; Mehmood and Parra 2013; Parra 2013; Baker and Mehmood 2015; Ayob et al. 2016) as a way to foster entrepreneurship, socioeconomic enhancement and sustainable development.

Drawing on Moulaert et al.'s (2013b) understanding of the concept, we define social innovation as changes in social relations, political arrangements and/or governance processes that lead to improvement in a social system. Social innovation is meant to improve society; therefore, it is normative in concept and practice (Jessop et al. 2013). Social innovation refers "not just to particular actions, but also to the mobilisation-participation processes and to the outcome[s] of actions which lead to improvements in social relations, structures of governance, greater collective empowerment, and so on" (Moulaert et al. 2013b, p.2). Social innovation improves the system's connections between socio-political levels and spatial scales. In particular, social innovation has the potential to link bottom-up initiatives with those at higher spatial levels leading to bottom-linked systems of governance, which can result in inclusive, diverse and adaptive governance systems (Pradel et al. 2013; Spijker and Parra 2018).

Social innovation is important in the adaptive governance of SES, and for biodiversity and natural resource conservation (Young et al. 2006; Chapin et al. 2010; Westley et al. 2013), but has been little studied in this context. Social innovation responds to the particular needs of the territory where it emerges, reflects the choices and decisions of the actors involved, and seeks to improve the social and ecological conditions of the territory (Moulaert 2009; Mehmood and Parra 2013; van Dyck and van den Broeck 2013). Social innovation improves the ability of a SES to respond to change and new challenges by identifying the factors and leverage points that foster transformation (Biggs et al. 2010). It promotes proactive and sustainable governance of a system, because it develops from the needs, challenges, resources and institutions of that SES. "People raise and frame socio-ecological problems, produce knowledge to deal with them and become socially engaged to address problems" (Parra 2013, p.150). Over time, social innovation leads to not only a modification in the issues that are addressed, but also to changes in the problems themselves, and in the ways these challenges are addressed;

including transformation in the structures and systems of governance. Social innovation is iterative in that it itself reveals opportunities to adapt to change and it inspires and initiates change.

Process outcomes from social innovation

Moulaert et al. (2005) described social innovation as a transformative process of social change. In the context of a SES, transformation means significant improvement in the system, its governance, or in the substantive or process outcomes achieved. Transformation requires and leads to profound changes in the knowledge, attitudes, skills, aspirations or behaviour of the actors (including their beliefs, norms, policies and practices), and in the flow, allocation and quality of power and resources in the SES (Moore and Tjornbo 2012; Baker and Mehmood 2015). In this process of transformation, it is possible to identify three interrelated process outcomes that tend to occur (and that we discuss below): satisfaction of the interests of actors; changes in socio-political arrangements; and empowerment of the participating actors (Moulaert et al. 2005; Moulaert et al. 2013a).

The first process outcome that tends to occur from social innovation is the satisfaction of the needs, desires and aspirations (i.e. the interests) of key actors, including the environment itself. Social innovation provides new ways by which interests at multiple levels can be identified, assessed and addressed. Innovation in methods and processes enhance the effectiveness and efficiency of decision-making processes, which means that the interests of more people can be considered and potentially met. Social innovation is an iterative process resulting in the revision and refinement of the interests of all parties, creating greater alignment and the ability to simultaneously meet the interests of the various actors (Parra 2013).

The second process outcome relates to changes in socio-political arrangements. Social innovation can occur in terms of the forms of social networks and the social relations between the people in the networks (Moulaert et al. 2013a). This social innovation might include ensuring the effective engagement of all key actors by the adoption of an improved governance mechanism that is more horizontal, participatory and inclusive – i.e. an adaptive governance system (Dietz et al. 2003; Folke et al. 2005; Armitage et al. 2007).

The third process outcome is empowerment of the participating actors. Empowerment is enhanced when changes in agendas and visions, and in the actions of relevant actors and institutions, lead to better inclusion of all social groups in decision-making, implementation and monitoring of strategies (Moulaert et al. 2013a). This can lead to the utilisation and diffusion of alternative knowledge (e.g. of those not previously included) and to better management of the SES (Parra 2013; Birnbaum 2016).

Methodology

To see how social innovation played out in practice, we considered the evolution of the Juan-Castro-Blanco National Water Park in Costa Rica, which is under the jurisdiction of the Arenal-Huetar North Conservation Area (ACAHN) within the Ministry of Environment and Energy. We specifically analysed how social innovation was expressed in the governance of the park. We primarily studied APANAJUCA (the Association for the Protection of the Juan-Castro-Blanco National Water Park), a self-organized, bottom-up, volunteer initiative that emerged to protect the park's freshwater and other natural resources. We observed the regional networks that developed around APANAJUCA to help us understand the dynamic ways in which the relations between the social and ecological are negotiated, maintained and fostered. It was not the intention of this paper to describe the observed dynamics; rather our purpose was to exemplify how social innovation plays out in practice and to discuss how this can enhance PA governance and regional sustainability.

The research was conducted as qualitative case study undertaken between 2013 and 2016. A total of seven months was spent by the lead author in Costa Rica. As a case study, a variety of research methods were used. First, 37 in-depth, semi-structured interviews were conducted in Spanish, including with key representatives of APANAJUCA, the Costa Rican Ministry of Environment and Energy, the Municipality of San Carlos, the Inter-American Development Bank, the University of Costa Rica, the National Technical University, actors from the communities around the Juan-Castro-Blanco, private entrepreneurs, and representatives of cooperatives and other NGOs. Formal informed consent was obtained for all interviews, and other principles of social research ethics were observed (Vanclay et al. 2013). Second, attendance (and observation) by special invitation at a range of meetings including: (i) between ACAHN and the Vice Minister of Environment, (ii) the Rural Electrification Cooperative of San Carlos (COOPELESCA), (iii) the Board of APANAJUCA, and (iv) a national water congress, which was attended by all key actors. Third, the lead author spent several days visiting the park, surrounds and nearby local communities. For these activities, she was accompanied by various actors associated with the PA (e.g. APANAJUCA board members, university student groups, and members of NGOs). Observations were recorded in a diary. Finally, we conducted a document analysis of all relevant archival, legal and on-line resources relating to the Juan-Castro-Blanco.

We utilised grounded theory tools, triangulation and a reflexive approach in our data gathering and analysis. Before going to the field, we reviewed all available information on the case. We used these initial findings to establish general guidelines for the interviews, but allowed participants to express what they considered to be important in the evolution of the park's governance. The interviews were audio-recorded and extensive notes were taken (on an iPad) during all interviews. The notes were then coded using Atlas.Ti. Initial coding utilised an emergent coding process, with the topics mentioned by the interviewees, which were later coded into broader themes associated with the theoretical framework of this paper.

We disclose that the primary author is a Costa Rican citizen who had previously worked as a planner in the Huetar-North region. Her professional and social contacts enabled her to have access to many sources that may not have been available to other researchers. However, at the time of the research, she had no relationship that would have constituted a conflict of interest.

The Juan-Castro-Blanco National Water Park and its champions

Juan-Castro-Blanco is a PA in the middle of Costa Rica founded in 1968. Although expanding over time, since 1975 it has been around 14,000 hectares. It is significant because of its substantial water resources and biodiversity. The park ranges in altitude from 490m to 2330m (see Figure 2.1), with steep slopes covering over 95% of its area. Landcover comprises primary forest (70%), farmland, and former mining sites that are being regenerated. The protective status of the park has been increasing over time due to the activities of various social groups, primarily with the intention to protect its water resources (see Table 2.1).

The social-ecological movement behind the creation of the park was one of the first community-based environmental mobilizations in Costa Rica. The leaders were local people, including active members of the Catholic Church, politicians, teachers, retailers, tourism entrepreneurs, representatives of communal associations, and individuals working at the electric companies, banks, municipalities and other public institutions. These individuals first came together as a local committee under the auspices of the Municipality of San Carlos, which had a strong interest in the park. In 1989, the Costa Rican central government granted a concession to a Canadian mining company to mine sulphur in the park. There was a rapid backlash from the community who strategically decided to separate the committee from the municipality so that they would have more freedom to fight this action. The NGO, EZONO, was thus created and within a year was successful in getting the sulphur concession cancelled. EZONO also achieved increased protection status for the PA, and promoted a sense of solidarity and common purpose in the region (CENAP 1990).

Although EZONO continues to exist today, it primarily acts as an environmental activist group at the regional level. With EZONO going on to address other priorities in the wider region, in 1998 the Association for the Protection of the Juan-Castro-Blanco National Water Park (APANAJUCA) was created to protect the park. Its founders decided that the park needed a dedicated organization that not only safeguards but represents the interests of the park, proactively acting in the interests of regional sustainable development. In 2003, APANAJUCA pushed the Costa Rican government to recognize the importance of the water resources, gaining for Juan-Castro-Blanco the unique protection category of national water park.
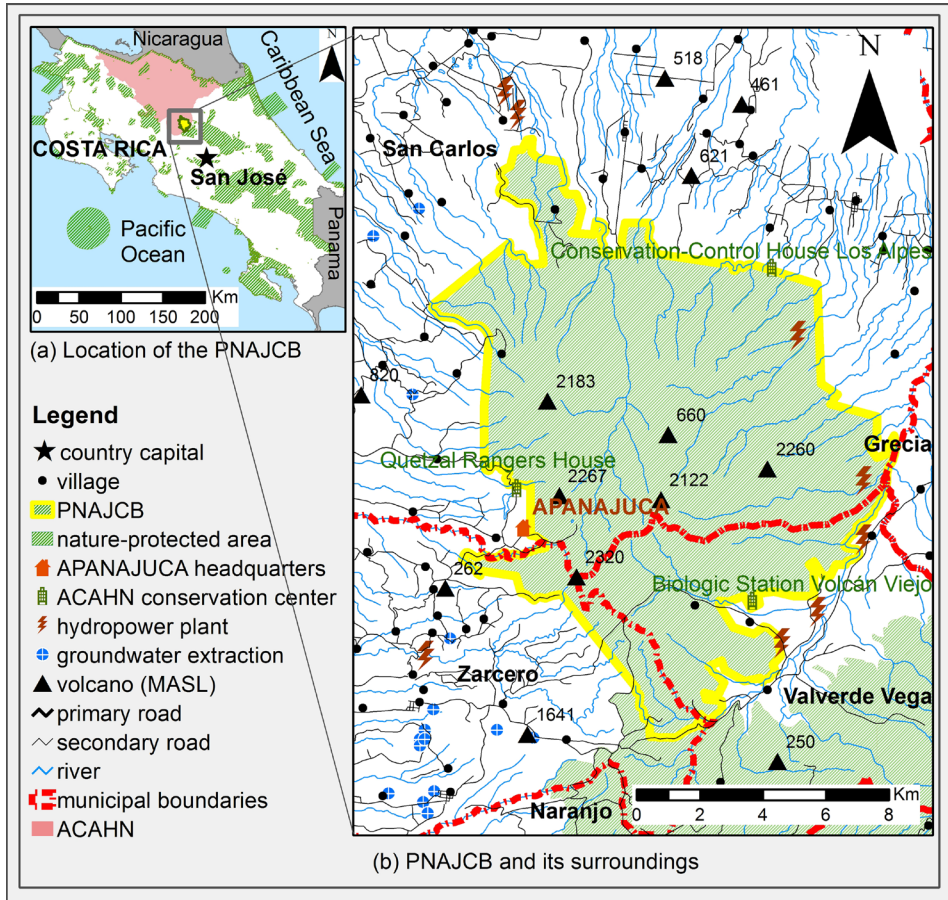
Figure 2.1. Map of the Juan-Castro-Blanco National Water Park.

(Source: author based on geographical information data provided by the Municipality of San Carlos, 2015; supplemented by personal observations)

APANAJUCA was constituted to protect the Juan-Castro-Blanco: to be vigilant of, not only the use of its resources by the population, but also of government actions and public policies that might harm the park. Its aim was to support the consolidation, management, protection, surveillance and development of the Juan-Castro-Blanco, ensuring freshwater as a 'source of life for future generations'. The actions and tools developed by APANAJUCA responded to the particular needs, challenges and resources of the territory, i.e. the conditions and capacities of the PA, its communities, actors, and institutions.

The ecological and social dynamics in the Juan-Castro-Blanco are intertwined. Through the actions of APANJUACA and its predecessors, the park's ecological qualities have been enhanced. In 1981 some university reports predicted that, if measures were not

Table 2.1. Evolution of the Juan-Castro-Blanco National Water Park.

Year	Name & national protective category	IUCN protective category	Area (Ha)	Key responsible actors	Motive
1968	National Forest Cerro Platanar	VI	2500	Citizen committee & Municipality of San Carlos	Protect water, landscape & local recreational values
1975	Forestry Reserve Juan Castro Blanco	VI	13,700	Citizen committee & Municipality of San Carlos	Protect water and forest
1989	Protective Zone	VI	14,258	EZONO	Prevent deforestation
1992	National Park	II	14,258	EZONO, other local NGO's, Catholic Church & communities	Prevent mining exploitation
1993	National Park	II	14,458	EZONO & Ministry of Environment	Protect biodiversity and water

(Source: author based on national laws, decrees, CENAP (1990), data provided by APAJAJUCA and supplemented by interviewees)

immediately taken, the forest cover would largely disappear by 2015, primarily from clearing for the expansion of dairy farming and agriculture (Bonilla 1981). Since then, clearing has been stopped; the amount of land protected has increased; theft of protected species (especially orchids and birds) has been reduced; habitats for endangered species have been enhanced, and there is increased community support for the park. At the time of writing (2018), the protected area of Juan-Castro Blanco was now over 14,000 hectares. Biodiversity recovery is taking place, for example the Heredia Robber frog, *Craugastor escoces,* has reappeared after being believed extinct for 30 years (Jiménez and Alvarado 2017).

In addition to its enhanced biodiversity status, the park is an important provider of ecosystem services and remains a major contributor to economic activity. It is the second largest water catchment in Costa Rica (in terms of harvest capacity), producing an average of 996 million cubic meters of water annually (SINAC 2012). More than 50 rivers have their source in the park, including many of the tributaries of the San Juan River of Nicaragua (SINAC 2012). The park provides potable water and irrigation to 150 communities in four municipalities comprising around 100,000 people (Blanco Rojas 2010). Water from the park is also used for hydroelectricity, generating over

160 MW or 17% of national electricity generation (SINAC 2012). Fourteen local and national public and private electricity companies derive direct benefit from the Juan-Castro-Blanco. Agriculture and dairying are also important activities within the park. The national cooperative of milk farmers, Dos Pinos R.L., with a large dairy processing plant in Quesada City, extracts its water from a spring that is fed by aquifers originating in the park. Some 216 cooperative members operate farms within the Juan-Castro-Blanco, their milk production comprises 12% of the national total.

In the Costa Rican context, the actions and achievements of APANAJUCA were unprecedented. APANAJUCA was recognised in 2012 with a national public award for 'Enhancement of the Quality of Life', because of its influence on regulations and formal conservation practices (Vida-UCR 2012). Costa Rica, like all developing countries, has insufficient economic resources to accomplish all national objectives. Although there is strong commitment for nature conservation and sustainable development, environmental management does not receive adequate financial support (Alpízar 2006; PEN 2013). Therefore, one mechanism that has been developed to address this deficiency is the implementation of controls over privately-held land. The Juan-Castro-Blanco is one such example, with 92% of its area being privately owned. In 1992 the government of Costa Rica intended to expropriate all private land within the park when it would have the financial resources to pay the compensation. In the interim, the current owners could continue to live in their existing dwellings, to utilize the land for current production activities, and even to sell the land, but they were restricted in their ability to change landuse. Owners were not permitted to reduce forest coverage, and had an obligation to preserve biodiversity (Asamblea Legislativa 1998). At the time of writing, the government had not acquired any of the privately-owned land.

How social innovation occurs in practice

By referring to our case study of the Juan-Castro-Blanco National Water Park, we exemplify how social innovation occurs in practice. We do this by describing in the context of our case the three process outcomes that arise from social innovation, specifically: the satisfaction of interests; changes to socio-political arrangements; and empowerment. The information presented here is primarily drawn from the interviews conducted with key actors. The examples we describe are not necessarily innovative in terms of being first in the world to use a particular tool or organisational strategy, rather they are examples of social innovation, especially in terms of how an otherwise conventional tool came to be used in the Costa Rican context, and the consequences of that use.

Satisfaction of the interests of key actors

APANAJUCA has high level goals relating to increasing the availability and quality of water for multiple purposes, and protection of the biodiversity values of the PA. It seeks

to achieve this by consolidation of land in order to ensure contiguous forest cover. Using a range of socially-innovative actions and drawing on the effective social relations it had developed with the key actors, APANAJUCA was able to implement a process of land consolidation. Below, we describe four of their actions.

Placement of boundary markers. The Juan-Castro-Blanco was the first PA in Costa Rica to have its perimeter (81km) demarcated by georeferenced markers, some 275 in total. This project was conducted between 2005 and 2006 with the participation of several parties, including hydroelectric companies, the Costa Rican Electricity Institute, ACAHN, and the Catholic Church. Due to the volunteer labour and equipment provided, the project only cost approximately $40,000, which was donated by the actors mentioned. Installing boundary markers established the boundaries of the park definitely, which enable park management (ACAHN) to defend the park should there be any boundary disputes. The boundary markers also gave certainty and security to the extraction rights of the hydroelectric companies, so it was in their interests to participate in this action. The Church saw this as a way of being relevant to local communities and as a needed social action.

Legal action to recover public land. In 1999, with a dedicated fund for the acquisition of land being available, the Ministry started to acquire a key property of 7,733 ha (representing 53% of the park). At face value, this seemed like a good idea, however, APANAJUCA did something very unusual – through the actions of a volunteer lawyer, Douglas Murillo, they succeeded in stopping the purchase. After an 11-year legal process, they were able to establish in court that the land had been illegally privatized and was therefore technically public land anyway. On 26 February 2010, the court (*Tribunal Contencioso Administrativo, Sección IX*; File Number 02-00373-0163-CA) ruled that the land should be reclassified back to public land. With this action, APANAJUCA saved the fund $1.5 million, which then could be used for other purposes. For various bureaucratic complexities, however, at the time of writing, formal title of the land had still not been changed. Douglas Murillo had a personal connection to the park and a special interest in environmental law and civil cases. This action was a way of using his legal skills for the public good.

Establishment of a PA cadastre. Costa Rica lacks an official national cadastre, which causes problems for and creates conflict between various institutions. In 2008, APANAJUCA together with ACAHN and the NGO, Nectandra Institute, initiated a project for the establishment and maintenance of cadastre and property database for all land within the park. The project determined that there were 557 properties wholly or partly within the park boundaries. The Nectandra Institute designed a tool for capturing digital information, and trained public servants in its use. This tool can now be used for other protected areas. The tool is of immense value to APANAJUCA and its management (ACAHN). The Nectandra Institute is an environmental NGO committed to protecting montane cloud forest in Costa Rica.

Land acquisition. Given that the national government does not have sufficient means to buy the private property within the park, APANAJUCA designed a mechanism by

which interested partner organisations can acquire land, which is then held in trust by the partner organisation for the collective good and conservation of the park. APANAJUCA finds interested organizations, manages the trust fund on behalf of the partner organisation, negotiates with landowners, and manages properties after they are bought. The first agreement under this mechanism was signed with COOPELESCA (the Rural Electrification Cooperative of San Carlos) in 2010. Since then, COOPELESCA's 60,000 members (electricity consumers) have been donating a small amount to the trust fund as part of their monthly electricity bill. By 2014, this had led to the acquisition of over 1,200 hectares, representing 8.5% of the park. This assisted in COOPELESCA gaining Carbon Neutral Certification in 2013.

Changes in socio-political arrangements

One of the benefits of APANAJUCA is its capacity to link top-down policy objectives with bottom-up community interests. In 2009, APANAJUCA was declared 'a public utility in the interests of the State' (Gobierno de Costa Rica 2009) giving it the right to manage public funds and public property for the benefit of the State. With this endorsement, APANAJUCA became a legally-legitimate (as well as socially-legitimate) actor in the management of the PA, thus fostering a change in the park's governance from top-down to a more bottom-up structure in which decision-making is shared.

The role APANJUCA has played in park governance was not only to integrate different sectors and actors, but also to set the agenda for the park's social-ecological development. For example, together with ACAHN, APANAJUCA participates in the park's annual strategic planning process, setting priorities across the different tasks of: using the cadastre tool; managing tourism; promoting biodiversity conservation and research; enhancing ecosystem services; and conducting surveillance. The governance system has been enriched by the role that APANAJUCA plays. APANAJUCA links the relevant sectors and their interests with public institutions, and has the capacity to anticipate and manage conflicts, and bring in innovative ideas. In this adaptive and socially-innovative governance system, the public and private sectors, the community, and the PA itself, can reveal and express their interests, and act collaboratively to enhance collective sustainability and wellbeing.

Empowerment of participating actors

Examining the social-ecological movements that led to the creation of the Juan-Castro-Blanco and APANAJUCA, it is clear that the different actors and sectors have been empowered. Acceptance of APANAJUCA as a legitimate management entity facilitated a process that empowered various actors and strengthened their capacity in three ways. First, the initial self-organized community mobilization that led to the creation of the park was able to evolve into a formal and stable organization (i.e. APANAJUCA). Second, APANAJUCA became entrusted by the national government and other social actors with

the management of the park and their collective concerns. Third, ACAHN and the Ministry gained the opportunity to become closer to civil society and take advantage of volunteer forces, developing sustainable co-management processes with the communities, farmers and hydroelectric companies within and on the periphery of the park.

The processes of social innovation enabled better identification, accessibility and management of the common-pool resources of the park. This developed gradually within the community, although some sectors required proof of how the various interests could be satisfied. A key opportunity came with the development of the COOPELESCA scheme. The unique aspect of this scheme was that APANAJUCA promotes land acquisition in the interests of the park, but does not become the land owner, thus retaining its trusted place as an 'honest broker'. The success of this scheme has led to further partnerships involving APANAJUCA, ACAHN, COOPELESCA and third parties. For example, an agreement was signed with the National Technical University in which its undergraduate students were encouraged to allocate their obligation to do 300 hours community service by assisting in various park activities (track maintenance, signage, and nursery labour).

Discussion

Our analysis of Juan-Castro-Blanco revealed how social innovation is locally produced and context specific in that social innovation is embedded in the local institutions and their interests and available resources (Moulaert 2009; van Dyck and van den Broeck 2013). Furthermore, while being moulded by the local physical and institutional conditions, social innovation improves an SES and its governance through the various ways in which people frame issues and act upon them (Parra 2013). In an iterative, dynamic process, opportunities for improvement are created (Borrini-Feyerabend and Hill 2015). For example, APANAJUCA aimed to act towards the protection of the park and its water resources, but they did more. In our case, social innovation led to substantive outcomes in ecological terms (e.g. landuse changes, improvement of ecosystems and ecosystem services, and increased quality and availability of water) and to process outcomes in social terms (e.g. satisfaction of interests, transformation in the governance system of the park, and empowerment of actors).

Nicholls and Murdock (2012) highlighted that social innovation can be invoked by processes that create: disruption or reconfiguration of the system; conflict and resistance; or inclusion and cooperation amongst actors. In the governance of the Juan-Castro-Blanco, resistance to top-down decisions, such as opposition to sulphur mining, initially characterized the actions of APANAJUCA and its predecessors. After winning some battles, APANAJUCA started to cooperate with ACAHN, the public agency responsible for the park's management. Later on, APANAJUCA adopted a more proactive role, in which they set the agenda and developed innovative mechanisms and processes for the management of the park. APANAJUCA achieved this, not by claiming ownership of the Juan-Castro-Blanco, but by being the legitimate voice of the interests of the park. In this way, APANAJUCA and ACAHN share responsibility for communicating and decision-

making. These nested political arrangements present challenges and opportunities for the management of PAs (Borrini-Feyerabend and Hill 2015), and show how significant local institutions can be in the success of PAs (Berkes 2004).

Social innovation, in the case of the Juan-Castro-Blanco and APANAJUCA, developed as dynamic social relations in response to social-ecological challenges prompting water protection as a common purpose. The improved social relations fostered transformations in the governance system towards an inclusive PA governance, in which access to decision-making processes and to the park itself facilitated satisfaction of the interests and empowerment of the participating actors. This kind of socially-innovative governance system was adaptive and proactive, delivering benefits such as:

- innovation in the involvement and contribution of the community and private sector in PA management leading to increased identification with the park and empowerment;

- innovation in engaging key individuals in significantly helping to achieve major conservation victories;

- innovation in the governance system by linking public and private organizations, and top-down with bottom-up structures, facilitating responsible access to common pool resources and enabling a broader vision that integrates social-ecological dynamics into the governance system of the PA;

- innovation in the rules, regulations, incentives, norms and legal arrangements relating to the park and its resources, not only opening opportunities to the private sector to contribute to conservation, but also in preventing actions that would jeopardize the sustainability of the resource; and

- innovation in identification, definition and satisfaction of the interests of participating actors, including the PA itself, the community, private sector, and public sector agencies.

The social innovation in the dynamics of the Juan-Castro-Blanco showed how bottom-linked processes of governance took place in the protection of natural resources and biodiversity. By pro-actively building and linking collective views about the future and identifying appropriate strategies, the practice of social innovation not only provoked social-ecological change, but gave the opportunity to further enhance the outcomes. These views and strategies came from the collaboration of multiple actors, including the central and local governments, communities, public and private organizations, and individuals. The support of the State in promoting conditions for social innovation is desirable (Borrini-Feyerabend et al. 2013; Moulaert et al. 2013a). In contexts like Costa Rica where financial resources are limited, the state could foster social innovation by implementing policies that facilitate private investment to support PAs, and by promoting proactive attitudes within public agencies, such as open-mindedness, flexibility, willingness to take risks, and trust in community engagement.

Conclusion

The Juan-Castro-Blanco National Water Park in Costa Rica was a good example of how social innovation was effected and led to better social-ecological outcomes. APANAJUCA developed a range of actions which improved the ecosystem and provoked greater identification with the park and its resources by the local community and other actors. APANAJUCA's activities also led to changes in the governance system that empowered participating actors. Ultimately, APANAJUCA's actions resulted in a range of social, economic and environmental outcomes at local, national and arguably international scales.

Our definition of social innovation – changes in social relations, political arrangements and/or governance processes that lead to improvement in a social system – was effective and helped in understanding how society and nature, and their dynamics and processes, are intertwined; how social innovation contributes to improving a SES; how transformations in the governance of PAs take place; and in particular, how a local NGO achieved outcomes which enhanced the sustainability of a PA. In the identification and implementation of social innovation strategies and management actions, APANAJUCA was able to foster inclusive and adaptive processes of governance that would not have occurred otherwise.

Social innovation, as it played out in the Juan-Castro-Blanco, was manifested in three main process outcomes: the satisfaction of the interests (needs, desires and aspirations) of all key actors; changes in socio-political arrangements (which reciprocally enhanced these outcomes); and empowerment of participating actors. Social innovation helped in detecting and addressing problems and opportunities for more sustainable development, and generated new perceptions and behaviours provoking further changes in the SES. Social innovation is thus a process of social and spatial transformation.

By understanding a PA as a SES, it becomes clear that PA governance must consider the social and political arrangements of all relevant actors, especially the affected communities. Managing biodiversity and natural resources has an impact on societal development, and reciprocally, decisions about societal development influence the performance of PAs. In this sense, PA governance must not only adapt by coping with change, but needs to proactively enable the involvement of different actors, embrace diversity, and effectively reconcile conflict. As seen in our example, social innovation is important in adaptive governance processes because it improves the ability of a SES to respond to challenges by creating opportunities to enhance the system. Understanding how social innovation manifests in SES governance provides evidence-based support for strategies, actions and policies that contribute to the improved management of PAs and to regional sustainability. We believe our findings can be of relevance in discussions about practices of governance in nature conservation and provide a framework to assist in understanding the social-ecological dynamics and transformations taking place in PAs elsewhere.

References

Alpízar, F. 2006. The pricing of protected areas in nature-based tourism: A local perspective. *Ecological Economics* 56(2), pp. 294–307.

ANSPE 2016. *Nodo nacional de innovación social*. Agencia Nacional para la Superación de la Pobreza Extrema (ANSPE). Available at: https://www.socialinnovationexchange.org/our-work/programmes/capacity-building-programmes/developing-ecosystems/colombian-centre-social

Armitage, D., Berkes, F. and Doubleday, N. eds. 2007. *Adaptive co-management: Collaboration, learning and multi-level governance.* Vancouver: UBCPress.

Asamblea Legislativa 1998. *Ley de biodiversidad*. Costa Rica: La Gaceta 101, date 27/05/1998.

Australian Government 2011. *Innovation policy report*. Canberra.

Ayob, N., Teasdale, S. and Fagan, K. 2016. How social innovation 'came to be': Tracing the evolution of a contested concept. *Journal of Social Policy* 45(4), pp. 635–653.

Baker, S. and Mehmood, A. 2015. Social innovation and the governance of sustainable places. *Local Environment* 20(3), pp. 321–334.

Basurto, X. and Jiménez-Pérez, I. 2013. Institutional arrangements for adaptive governance of biodiversity conservation: The experience of the Area de Conservación Guanacaste, Costa Rica. *Journal of Latin American Geography* 12(1), pp. 111–134.

BEPA 2014. *Social Innovation. A Decade of Changes*. Luxemburg: Publications Office of the European Commission.

Berkes, F. 2004. Rethinking community-based conservation. *Conservation Biology* 18(3), pp. 621–630.

Biggs, R., Westley, F. and Carpenter, S. 2010. Navigating the back loop: Fostering social innovation and transformation in ecosystem management. *Ecology and society* 15(2), art9.

Birnbaum, S. 2016. Environmental co-governance, legitimacy, and the quest for compliance: When and why is stakeholder participation desirable? *Journal of Environmental Policy & Planning* 18(3), pp. 306–323.

Blanco Rojas, H. 2010. Áreas de recarga hídrica de la parte media-alta de las microcuencas Palo, Marín y San Rafaelito, San Carlos, Costa Rica. *UNED Research Journal* 2(2), pp. 181–204.

Bodin, Ö., Sandström, A. and Crona, B. 2017. Collaborative networks for effective ecosystem-based management: A set of working hypotheses. *Policy Studies Journal* 45(2), pp. 289–314.

Bonilla, A. 1981. Reserva Forestal Juan Castro Blanco. *Prociencia* 5(28), pp. 8–9.

Borrini-Feyerabend, G., Dudley, N., Jaeger, T., Lassen, B., Pathak Broome, N., Phillips, A. and Sandwith, T. 2013. *Governance of protected areas: From understanding to action.* Gland, Switzerland: UICN.

Borrini-Feyerabend, G. and Hill, R. 2015. Governance for the conservation of nature. In: Graeme L. Worboys, Michael Lockwood, Ashish Kothari, Sue Feary, and Ian Pulsford eds. *Protected Area Governance and Management*. Canberra: ANU Press, pp. 169–206.

Brockington, D., Duffy, R. and Igoe, J. 2008. *Nature unbound: Conservation, capitalism and the future of protected areas*. London: Earthscan.

Brondizio, E.S., Ostrom, E. and Young, O.R. 2009. Connectivity and the governance of multilevel social-ecological systems: The role of social capital. *Annual Review of Environment and Resources* 34(1), pp. 253–278.

Chapin, F.S. et al. 2010. Ecosystem stewardship: Sustainability strategies for a rapidly changing planet. *Trends in Ecology & Evolution* 25(4), pp. 241–249.

Cumming, G.S. and Allen, C.R. 2017. Protected areas as social-ecological systems: Perspectives from resilience and social-ecological systems theory. *Ecological Applications* 27(6), pp. 1709–1717.

Davoudi, S. 2012. Resilience: A bridging concept or a dead end? *Planning Theory & Practice* 13(2), pp. 299–307.

Dietz, T., Ostrom, E. and Stern, P.C. 2003. The struggle to govern the commons. *Science* 302(5652), pp. 1907–1912.

Doak, D.F., Bakker, V.J., Goldstein, B.E. and Hale, B. 2014. What is the future of conservation? G., W., E., C., and T., B. eds. *Trends in Ecology & Evolution* 29(2), pp. 77–81.

Dudley, N. ed. 2008. *Guidelines for applying protected area management categories*. Gland, Switzerland: IUCN.

Dudley, N., Groves, C., Redford, K.H. and Stolton, S. 2014. Where now for protected areas? Setting the stage for the 2014 World Parks Congress. *Oryx* 48(4), pp. 496–503.

Dudley, N., Parrish, J.D., Redford, K.H. and Stolton, S. 2010. The revised IUCN protected area management categories: The debate and ways forward. *Oryx* 44(4), pp. 485–490.

Folke, C., Hahn, T., Olsson, P. and Norberg, J. 2005. Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources* 30(1), pp. 441–473.

Francis, G. 2008. Evolution of contexts for protected areas. In: Hanna, K., Clark, D., and Slocombe, D. eds. *Transforming parks and protected areas: Policy and governance in a changing world*. New York: Routledge, pp. 15–38.

Gobierno de Costa Rica 2009. *Declara de utilidad pública para los intereses del Estado la Asociación Pro Desarrollo Parque Nacional del Agua Juan Castro Blanco*. Costa Rica: La Gaceta 102, published on 28/05/2009.

GOBIERNOCR 2017. *Costa Rica supera 98% de generación eléctrica renovable por segundo año consecutivo*. Available at: http://gobierno.cr/costa-rica-supera-98-de-generacion-electrica-renovable-por-segundo-ano-consecutivo

Hanna, K., Clark, D. and Slocombe, D. eds. 2008. *Transforming parks and protected areas: Policy and governance in a changing world*. New York: Routledge.

Hayes, T. and Ostrom, E. 2005. Conserving the world's forests: are protected areas the only way. *Indiana Law Review* 38(3), pp. 595–617.

Holmes, G. 2013. Exploring the relationship between local support and the success of protected areas. *Conservation and Society* 11(1), p. 72.

Imperiale, A.J. and Vanclay, F. 2016. Experiencing local community resilience in action: Learning from post-disaster communities. *Journal of Rural Studies* 47, pp. 204–219.

Jessop, B., Moulaert, F., Hulgård, L. and Hamdouch, A. 2013. Social innovation research: A new stage in innovation analysis? In: Moulaert, F., MacCallum, D., Mehmood, A. and Hamdouch, A. ed. *The International Handbook of Social Innovation Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 110-132.

Jiménez, R. and Alvarado, G. 2017. Craugastor escoces (Anura: Craugastoridae) reappears after 30 years: Rediscovery of an "extinct" neotropical frog. *Amphibia-Reptilia* 38(2), pp. 257–259.

Kelboro, G. and Stellmacher, T. 2015. Protected areas as contested spaces: Nech Sar National Park, Ethiopia, between 'local people', the state, and NGO engagement. *Environmental Development* 16, pp. 63–75.

Kitamura, K. and Clapp, R.A. 2013. Common property protected areas: Community control in forest conservation. *Land Use Policy* 34, pp. 204–212.

Kohlmann, B., Roderus, D., Elle, O., Solis, A., Soto, X. and Russo, R. 2010. Biodiversity conservation in Costa Rica: A correspondence analysis between identified biodiversity hotspots (Araceae, Arecaceae, Bromeliaceae, and Scarabaeinae) and conservation priority life zones. *Revista Mexicana de Biodiversidad* 81(2), pp. 511–559.

Kuzdas, C., Wiek, A., Warner, B., Vignola, R. and Morataya, R. 2014. Sustainability appraisal of water governance regimes: The case of Guanacaste, Costa Rica. *Environmental Management* 54(2), pp. 205–222.

Liu, J. et al. 2007. Coupled human and natural systems. *AMBIO: A Journal of the Human Environment* 36(8), pp. 639–649.

Lober, D.J. 1992. Using forest guards to protect a biological reserve in Costa Rica: One step towards linking parks to people. *Journal of Environmental Planning and Management* 35(1), pp. 17–41.

MacCallum, D., Moulaert, F., Hillier, J. and Vicari Haddock, S. eds. 2009. *Social innovation and territorial development*. Surrey: Ashgate Publishing Ltd.

Mathevet, R., Thompson, J.D., Folke, C. and Chapin, F.S. 2016. Protected areas and their surrounding territory: Socioecological systems in the context of ecological solidarity. *Ecological Applications* 26(1), pp. 5–16.

Mehmood, A. and Parra, C. 2013. Social innovation in an unsustainable world. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 53–66.

Miller, M.J. 2006. Biodiversity policy making in Costa Rica. *The Journal of Environment & Development* 15(4), pp. 359–381.

Molina Murillo, S.A., Pérez Castillo, J.P. and Herrera Ugalde, M.E. 2014. Assessment of environmental payments on indigenous territories: The case of Cabecar-Talamanca, Costa Rica. *Ecosystem Services* 8, pp. 35–43.

Moore, M.-L. and Tjornbo, O. 2012. From coastal timber supply area to Great Bear Rainforest: Exploring power in a social–ecological governance innovation. *Ecology and Society* 17(4), art26.

Moulaert, F. 2009. Social innovation: Institutionally embedded, territorially (re) produced. In: MacCallum, D., Moulaert, F., Hillier, J., and Vicari, S. eds. *Social innovation and territorial development*. UK: Ashgate Publishing Company, pp. 11–23.

Moulaert, F., MacCallum, D. and Hillier, J. 2013a. Social innovation: Intuition, precept, concept, theory and practice. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 13–24.

Moulaert, F., MacCallum, D., Mehmood, A. and Hamdouch, A. 2013b. General introduction: the return of social innovation as a scientific concept and a social practice. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 1-6.

Moulaert, F., Martinelli, F., Swyngedouw, E. and Gonzalez, S. 2005. Towards Alternative Model(s) of Local Innovation. *Urban Studies* 42(11), pp. 1969–1990.

Murray, R., Caulier-Grice, J. and Mulgan, G. 2010. *The open book of social innovation*. UK: The Young Foundation, NESTA.

Nicholls, A. and Murdock, A. 2012. The nature of social innovation. In: Nicholls, A. and Murdock, A. eds *Social innovation. Blurring boundaries to reconfigure markets*. Great Britain: Palgrave Macmillan, p. 302.

Obando Acuña, V. 2007. *Biodiversidad de Costa Rica en cifras*. Heredia, CR: Editorial INBio.

OECD 2011. Fostering innovation to address social challenges. Workshop Proceedings. In: *Innovation Strategy*. OECD, p. 99.

Ostrom, E. 2012. The future of the commons: Beyond market failure and government regulation. In: Ostrom, E., Chang, C., Pennington, M., and Tarko, V. eds. *The future of the commons. Beyond market failure and government regulation*. London: The Institute of Economic Affairs, pp. 68–83.

Parra, C. 2013. Social sustainability, a competitive concept for social innovation? In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 142–154.

Parra, C. and Moulaert, F. 2016. The governance of the nature-culture nexus: Lessons learned from the San Pedro de Atacama case-study. *Nature+Culture* 11(3), pp. 239–258.

Pradel, M., García, M. and Eizaguirre, S. 2013. Theorizing multi-level governance in social innovation dynamics. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds *The International Handbook of Social Innovation*

Collective Action, Social Learning and Transdisciplinary Research. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 155–168.

Presidencia de la República de Colombia 2014. *Innovación social creada por jóvenes - ISxJ*. Available at: http://wsp.presidencia.gov.co/ColombiaJoven/estrategias/Paginas/isxj.aspx

Pringle, R.M. 2017. Upgrading protected areas to conserve wild biodiversity. *Nature* 546(7656), pp. 91–99.

PEN 2013. *Decimonoveno Informe Estado de la Nación en desarrollo humano sostenible*. San José, Costa Rica. Available at: http://estadonacion.or.cr/index-en/informe-xix-estado-nacion

Schultz, L., Folke, C., Österblom, H. and Olsson, P. 2015. Adaptive governance, ecosystem management, and natural capital. *Proceedings of the National Academy of Sciences* 112(24), pp. 7369–7374.

SINAC 2012. *Plan general de manejo del Parque Nacional del Agua Juan Castro Blanco*. San Carlos, Costa Rica.

Spijker, S.N. and Parra, C. 2018. Knitting green spaces with the threads of social innovation in Groningen and London. *Journal of Environmental Planning and Management* 61(5–6), pp. 1011–1032.

Steinberg, P.F. 2001. *Environmental leadership in developing countries: Transnational relations and biodiversity policy in Costa Rica and Bolivia*. Cambridge, MA: MIT Press.

Tallis, H. and Lubchenco, J. 2014. Working together: A call for inclusive conservation. *Nature* 515(7525), pp. 27–28.

The White House and United States of America 2015. *Office of Social Innovation and Civic Participation*. Available at: https://obamawhitehouse.archives.gov/administration/eop/sicp

van Dyck, B. and van den Broeck, P. 2013. Social innovation: A territorial process. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 131–141.

Vanclay, F. 2017. Principles to gain a social licence to operate for green initiatives and biodiversity projects. *Current Opinion in Environmental Sustainability* 29, pp. 48–56.

Vanclay, F., Baines, J.T. and Taylor, C.N. 2013. Principles for ethical research involving humans: Ethical professional practice in impact assessment Part I. *Impact Assessment and Project Appraisal* 31(4), pp. 243–253.

Vida-UCR 2012. En UCR entregan premios a la calidad de vida. *Noticias Universidad de Costa Rica*. https://www.ucr.ac.cr/noticias/2012/10/25/en-ucr-entregan-premios-a-la-calidad-de-vida.html

Watson, J.E.M., Dudley, N., Segan, D.B. and Hockings, M. 2014. The performance and potential of protected areas. *Nature* 515(7525), pp. 67–73.

Westley, F.R., Tjornbo, O., Schultz, L., Olsson, P., Folke, C., Crona, B. and Bodin, Ö. 2013. A theory of transformative agency in linked social-ecological systems. *Ecology and Society* 18(3), art27.

Young, O.R., Berkhout, F., Gallopin, G.C., Janssen, M.A., Ostrom, E. and van der Leeuw, S. 2006. The globalization of socio-ecological systems: An agenda for scientific research. *Global Environmental Change* 16(3), pp. 304–316.

TRANSFORMATIVE SOCIAL INNOVATION FOR SUSTAINABLE RURAL DEVELOPMENT

Abstract

The interactions between bottom-up initiatives and top-down structures in the implementation of regional development policies and projects are complex in theoretical and practical terms. Using concepts such as transformative social innovation, adaptive governance, and bridging institutions, we developed an analytical framework to enhance understanding of the processes by which local top-down and bottom-up forces enhance sustainable rural development by co-developing bottom-linked governance. Bottom-linked governance is a multi-level middle ground where actors from various political levels, geographical scales and industry sectors come together to share decision-making. Social innovation has the potential to be transformative, but to do this, it has to be able to scale-up and provoke changes in the governance system. Using a rural social innovation initiative in Costa Rica, we tested our framework and considered the enabling factors of bottom-linked governance. They comprise the various bridging roles the initiative must play: network enabler; knowledge broker; resource broker; transparency and conflict resolution agent; and shared vision champion. We also considered the critical success factors of bottom-linked governance. Bottom-linked governance and social innovation together comprise how planning practice contributes to social-ecological regional development. Sharing of power and participatory decision-making facilitate more flexible, inclusive and effective planning. Our analytical framework was helpful in understanding how a social innovation initiative fostered transformation and contributed to sustainable rural development.

Keywords: social innovation; sustainable rural development; social-ecological systems; adaptive governance; bridging organizations; spatial planning practice.

Transformative social innovation for sustainable rural development: An analytical framework to assist community-based initiatives

Introduction

A constant challenge in regional planning practice is how to effectively implement development policies and projects that bring sustainability to rural regions. Although the participation of communities in planning processes has been much discussed, the tensions between bottom-up initiatives and top-down structures are still difficult to reconcile (Taylor and de Loë 2012; Butler et al. 2015; Molden et al. 2017)). With the increasing experience of these tensions by rural regions, there is growing concern about how rural development initiatives manage this tension (see LEADER/CLLD, EU program e.g. Dax 2006; Pires et al. 2014; Dax et al. 2016). By combining the bodies of literature on adaptive governance of social-ecological systems (SES), social innovation, and bridging organizations, we consider how a regional governance system can be transformed into an adaptive system that facilitates planning practice, which encompasses bottom-up and top-down collaboration.

The aim of this paper is to improve understanding about how political structures and governance levels can be better connected in theory and practice. We therefore designed an analytical framework of transformative social innovation. Specifically, we explore how social innovation initiatives promote transformation in a SES, i.e. a rural region, by fostering bottom-linked governance. Bottom-linked governance refers to a collaborative middle ground where actors from varied political levels, geographical scales and industry sectors converge to share decision-making (Pradel et al. 2013). The analytical framework we designed is informed by the theoretical reflections presented here, as well as by our empirical work with a specific social innovation, the Association for the Development of the North Zone (ADEZN) in Costa Rica. We conclude with reflections on the insights our analytical framework provides for the theory and practice of rural planning and regional development.

Bringing together theories about social transformation

Regions, social-ecological systems and adaptive governance

The term, region, is somewhat ambiguous, can be nebulous, and does not necessarily imply a precisely-demarcated area (Paasi 2013). Nevertheless, similar to the concept of territory, region refers to geographical location and to all the relationships among the social, economic, ecological and physical processes that comprise it (Allen et al. 1998). Understanding that regions consist of social as well as natural domains, and that the internal processes between them are intertwined, implies that regions are dynamic, complex territories. Thus, a region can be considered as a social-ecological system (SES) (Folke 2006; Biggs et al. 2010; Ostrom and Cox 2010).

Adaptation is defined as the capacity of a SES to learn, combine experiences and knowledge, and adjust its responses to changing external and internal pressures and processes, while continuing to develop, thus resulting in overall improvement (Berkes et al. 2003; Barnes et al. 2017). An adaptive governance approach provides an effective way to create an inclusive and forward-looking vision of sustainable rural development, in which the varied, multi-level actors develop resilience, embrace change, and are empowered to influence future development trajectories (Davoudi 2012; Imperiale and Vanclay 2016; Barnes et al. 2017). Spatial planning practice operating in an adaptive governance system is likely to be more fluid and inclusive, thus facilitating more effective decision-making, especially in complex situations (Wilkinson 2012; Menzel and Buchecker 2013; Butler et al. 2015). For a governance system to be adaptive requires that the socio-political arrangements governing the SES: (1) actively involve different actors; (2) embrace diversity of values, interests, perspectives, and management methods; and (3) are able to effectively reconcile conflict (Castro-Arce et al. 2019). Drawing on Dietz et al. (2003), Chaffin et al. (2014, p.7) pointed out that an optimal adaptive governance system "requires a structure of nested institutions (complex, redundant, and layered) and institutional diversity (a mixture of market, state, and community organizations) at the local, regional, and state levels, connected by formal and informal social networks".

Scholars highlight social innovation as being key in triggering an ongoing process of change and renewal, thus promoting an adaptive governance system (Biggs et al. 2010; Westley et al. 2013; Baker and Mehmood 2015; Spijker and Parra 2018). Social innovation has the potential to be used to identify the factors and leverage points that foster transformative change in an SES and its governance (Biggs et al. 2010). According to Mangabeira Unger (2015), social innovation is stimulated by society, and creates awareness of the challenges provoking change in society. Social innovation is especially important because "the established ways in which society provides for its own revision never exhaust the ways in which it can be changed" (Mangabeira Unger 2015, p.233). Thus, social innovation can be seen as an adaptive response of the system, e.g. a reaction to a crisis or conflict, or as a dynamic that fosters adaptive governance by provoking changes in the system.

Transformative social innovation

We introduce social innovation, not just as an interesting concept to advance the theory of adaptive governance of SES, but also as a practice that encourages the governance system and regional planning to adapt (Baker and Mehmood 2015). Drawing on Moulaert et al. (2013)) and Mangabeira Unger (2015), social innovation can be defined as the creation, renewal or transformation of social relations in the development of new ways of working together to achieve societal goals. How social innovation addresses community interests necessarily involves socio-political mobilization, which will normally lead to empowerment of rural communities (Bock 2012; Neumeier 2012; Moulaert et al. 2013; Bock 2016). When social innovation seeks to address more than just immediate pressing needs, and actively searches for new sustainability pathways, it will likely transcend geographical scales and political levels, and be instrumental in societal transformation (Mangabeira Unger 2015). Thus, social innovation has the potential to be transformative, i.e. to profoundly affect the governance system by changing socio-political roles and routines, beliefs, knowledge, power flows and resources (Moulaert et al. 2005; McGowan and Westley 2015; Parés et al. 2017), and by encouraging the system to adapt and bounce forward (Davoudi 2012).

Social innovation is generally regarded as a normative concept and practice, in that it is meant to improve society (Moulaert et al. 2017). Social innovation is about the satisfaction of social needs and the achievement of common desires and aspirations. It comprises the processes and arrangements needed to identify, assess and address these interests, and to empower groups in society (Castro-Arce et al. 2019). Social innovation refers to the actions, participatory processes and outcomes that provoke changes in social relations, collective empowerment, political arrangements and/or governance processes, and lead to improvements in the social system (Moulaert et al. 2013). Therefore, in the literature there is a panoply of applications – from the development of new ideas, products and services, to improvements in actions and processes, the adoption of new social practices, opening-up for creative spaces, novel and renewed institutional arrangements, more democratic forms of participation, and more – all of which seek a more equitable, fair, efficient, effective and sustainable society.

For most scholars, social innovation must have broad transformative impact (Avelino et al. 2017; Novy 2017; Parés et al. 2017; Westley et al. 2017). The significant economic, social, environmental and technological challenges societies around the world face cannot be addressed by disconnected local initiatives. But when local-level initiatives become interwoven across geographical scales and political levels, social innovation can work towards systemic change (Parés et al. 2017). Drawing on Avelino et al. (2019) and Parés et al. (2017), *transformative* social innovation is social innovation that leads to changes in agendas, institutions and agency, profoundly influencing basic routines, beliefs, power relations and/or resources. Transformative social innovation contributes and aspires to broad, comprehensive social-ecological change, including: better socio-economic outcomes (Novy 2017), more sustainable livelihoods and lifestyles (Mehmood and Parra 2013), and greater resilience (Imperiale and Vanclay 2016; Westley et al. 2017). To achieve these overarching outcomes, social innovation initiatives must have

the ability to scale-up to become part of a multi-level governance system (Novy 2017; Avelino et al. 2019).

By connecting socio-political levels and spatial scales with wider structures, bottom-up social innovation has the potential to contribute innovations that will lead to transformation and improvements in the regional governance system. In linking bottom-up initiatives with those at higher spatial levels, transformative social innovation enables bottom-linked systems of governance (Pradel et al. 2013), opening up possibilities for more inclusive, diverse and adaptive governance systems (Castro-Arce et al. 2019).

Bottom-linked governance and bridging institutions

Bottom-linked systems of governance provide a middle ground that emerges when social innovation deals with the tensions and mismatches between levels, scales and sectors. Bottom-linked governance occurs in the interactions between bottom-up and top-down. Bottom-linked governance can be seen as both an outcome of social innovation, and as a socially-innovative space of action. Bottom-linked governance is an outcome when it is stimulated by the reconfiguration of social relations that occur through social innovation. This reconfiguration materialises when individuals or groups of people experiment with roles, functions and tasks in order to seek satisfaction of their unmet needs (Spijker and Parra 2018). Social innovation also emerges when actors at varying political levels, spatial scales and action arenas interact in new networks and collaborate in new ways. Bottom-linked governance becomes a space of action because it facilitates ongoing innovation in how things are done, leading to more flexible, collaborative, inclusive and adaptive governance systems. The structure of governance systems has an influence on the capacity of different actors to develop socially innovative practices (Pradel et al. 2013). Innovative governance systems that connect bottom-up with top-down regional concerns are more likely to develop collaborative and flexible initiatives oriented towards regional sustainability (Westley et al. 2017).

Not all social innovation initiatives have the ability to trigger bottom-linked systems of governance (Pradel et al. 2013). Bottom-linked governance can be fostered when social innovation builds bridges amongst social groups, political arenas, geographical scales and industry sectors. Bridging abilities are essential to foster adaptive governance systems (Cooper and Wheeler 2015), and are inherent in the concept of bridging organizations. Bridging organizations are formal organizations that use collaborative mechanisms to bring diverse actors together (Crona and Parker 2012; Kowalski and Jenkins 2015). Bridging organizations have been much discussed in the literature on SES governance and sustainability (Brown 1991; Folke et al. 2005; Hahn et al. 2006; Berkes 2009). However, except for Biggs et al. (2010), the links between bridging organisations, social innovation and transformation in SES have not been addressed. Because bridging organisations are regarded as formal organisations, we prefer the term, bridging institutions, so that informal organisations are also included. Drawing on Ostrom (2005), we define institutions as a broad concept that encompasses all the formal and informal arrangements people use to organise and govern their interactions amongst themselves,

their interactions with the environment, and the mechanisms for creating and changing these arrangements.

Due to their varied functions, bridging institutions have the potential to influence other institutions, governance systems, and the degree of empowerment of social groups. A bridging institution can also influence the way crises are perceived, problems are assessed, and collective visions are constructed. According to Brown (1991), a bridging institution "can be a conduit of ideas and innovations, a source of information, a broker of resources, a negotiator of deals, a conceptualiser of strategies, [and] a mediator of conflicts" (1991, p.812).

Two major consequences arise from bridging institutions: overcoming the barriers to collaboration; and facilitating reduction of the costs while increasing the benefits of collaboration (Brown 1991; Folke et al. 2005; Hahn et al. 2006; Berkes 2009). The first consequence comes from the various roles bridging institutions can play, including being a: channel for inter-institutional collaboration; interlocutor in horizontal and vertical communication; facilitator in building shared visions; mediator for the resolution of conflict; promoter of multi-level networks; and agent in the co-production and transfer of knowledge. The second consequence (reduced cost and increased benefits of collaboration) derives from these bridging functions, because they strengthen social capital, foster the empowerment of actors, stimulate accountability, and the building of trust between actors.

Methodology

Our analytical framework, which we explain fully below, was developed across successive brainstorming sessions in which the authors reflected on the meaning of social innovation and how it plays out in practice. Using our individual experiences with bottom-up initiatives, and by engaging with the theoretical and applied literature, our framework was iteratively developed over time. Our ideas have been presented at various conferences and seminars, and the framework has been adaptively developed in response to comments received and our own reflections.

We initially tested the framework with several cases of social innovation with which we have worked (in Australia and Costa Rica). For the purposes of illustrating the framework and for efficiency, in this paper we use only one exemplar, a social innovation initiative from Costa Rica, the Association for the Development of the North Zone (ADEZN). This initiative was purposively selected as our exemplar because it was a successful, rural, self-organized, bottom-up initiative that has flourished for over 17 years. ADEZN is an independent regional development agency based in the rural northern part of Costa Rica (the Huetar-North region). ADEZN considers itself to be a territorial development experiment with a mission to promote sustainable regional socio-economic development and wellbeing.

To verify that ADEZN was truly a social innovation, we applied the criteria elaborated by Moulaert et al. (Moulaert et al. 2005; Moulaert et al. 2013), namely, that to be a social innovation, an initiative must: (a) act towards the satisfaction of human needs that are not currently satisfied; (b) provoke changes in governance to enable this satisfaction, and to increase the level of participation of all actors; and (c) foster empowerment by enhancing socio-political capability and access to resources. In our opinion, ADEZN fully met these criteria (see section 6.2.1 for further elaboration).

The original research on ADEZN was a qualitative case study. Data were obtained during field visits in 2014 (July-August) and 2015 (July-November), and by ongoing monitoring of online sources. As a practitioner and scholar in the field of spatial planning in Costa Rica, the lead author had considerable knowledge of regional development initiatives and professional contacts providing her with unrestricted access to the case. Consistent with a typical case study, data included in-depth interviews (47 in total), participant observation of its various activities, analysis of relevant documents and online sources, and field observation of ADEZN projects and the local environment. The lead author interviewed people within ADEZN (e.g. executives, board members, associates), community members in locations where projects were implemented, local government and local public agency personnel, (former) ministers and public servants from central government, and other key people.

The principles of ethical social research were observed (Vanclay et al. 2013) and informed consent was obtained for all interviews. All interviews were recorded, and extensive notes were taken in situ. The interviews were conducted in Spanish, and all data was retained in Spanish. Atlas.ti was used to assist in the management of data. Various extracts were selected for inclusion in the paper, being translated by the authors. In the translation, an attempt was made to ensure the original meaning was transferred into English, rather than simply providing a direct literal translation.

The interviewees were asked about: the characteristics of the context at the time ADEZN commenced and changes over time; its general profile (aims, goals, governance, resources, strategies, organisational structure and activities); the rationale for belonging to ADEZN; the value of the networks ADEZN created; the effectiveness of its multi-level dynamics; its impact on rural development; and other impacts. All activities of ADEZN were examined in some detail, including projects that were completed, in progress, or planned. Failures as well as successes were considered.

An analytical framework for transformative social innovation

Drawing on our literature review and by reflecting on our empirical research, we designed an analytical framework that explains how transformative social innovation occurs (see Figure 3.1). Local interests and context situations are both triggers of social innovation. We argue that social innovation enables bottom-linked governance, and that these two
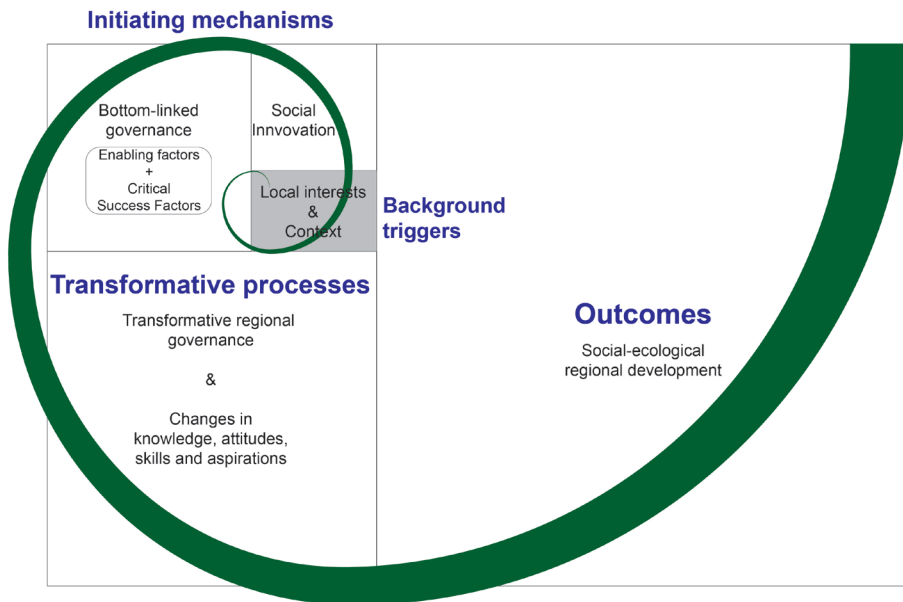
Figure 3.1. Analytical framework for transformative social innovation.

(Source: author. Image inspired by Murray et al., 2010)

mechanisms are both needed for bottom-up actions to scale-up to achieve transformation at higher levels. Regional transformation is realised in the territory by transformations in the governance system and by transformations in relevant actors. As a result of the transformation, these actors will exhibit changes in their knowledge, attitudes, skills and aspirations (KASA change, see Vanclay 2015).

The ultimate goal or outcome of planning is to achieve social-ecological development. This is an ideal state, with high levels of sustainability, resilience and community wellbeing. We argue that, under the right conditions – i.e. enabling factors (including bridging roles) and critical success factors (described below) – social innovation together with bottom-linked governance will result in transformational processes leading to social-ecological development.

Bridging roles as enabling factors of bottom-linked governance

Transformative social innovation is enacted through bottom-linked governance. Social innovation initiatives must have the ability to build bridges and create links between the bottom-up and the top-down. There are several roles that can be played to enable bridge-building. By analysing the key papers on bridging institutions in sustainable development (Brown 1991; Folke et al. 2005; Hahn et al. 2006; Berkes 2009), we identified the five

roles that must be undertaken by actors participating in social innovation initiatives if transformation is to occur.

1. *Network enabler*: transformative social innovation initiatives develop networks and/or connect existing networks. Fostering the collaboration of actors through networks is fundamental to all dynamics taking place in and around bridging institutions. Problems can be better tackled when actors with interests in regional development collaborate and exchange with each other at vertical and horizontal levels. Collaboration through networks creates awareness of and empathy for the needs and opportunities of all actors.

2. *Knowledge broker*: transformative social innovation initiatives provide a forum for knowledge sharing, knowledge creation and knowledge translation. As bridging institutions, transformative social innovation initiatives assist in exchanging local knowledge, science, and technical expertise. These institutions, together with interested actors, co-create information. Bridging institutions are especially effective in dealing with knowledge issues, particularly where local knowledge is based on cosmologies, epistemologies or worldviews that are different from mainstream science, technocratic policy, or hegemonic political discourses.

3. *Resource broker*: transformative social innovation initiatives serve as arenas for negotiation and decision-making. Actors from different industry sectors and political levels express their interests, but can also contribute resources for tackling particular problems. Bridging institutions facilitate collaboration between actors resulting in win-win outcomes. These institutions create opportunities, not in self-interest, but in the interests of all the actors in the networks and for the benefit of the region. By connecting actors, identifying and addressing their interests, and harnessing resources, bridging institutions provide an important service to all parties, for example in reducing transaction costs (not only in monetary, but also in political and social terms), and in raising awareness of the importance of collaboration for the satisfaction of needs.

4. *Transparency and conflict resolution agent*: transformative social innovation initiatives promote participation and collaboration around common agendas. How these initiatives are organised is critical for their ability to manage their relations with other actors, within networks, and for the way agendas are built and pushed forward. When the rules of the bridging institutions are clear and transparent to the participating actors, and shared openly with other actors in the governance system, trust is built. In gaining the trust of all parties, the bridging institutions provide a space for conflict resolution, facilitating the flow of knowledge and resources. Resolving conflict is essential for all social innovations, because they have considerable potential to create conflict due to the fact that these conflicts tend to revolve around the allocation of resources.

5. *Shared vision champion*: transformative social innovation initiatives enact a process to create a shared vision of sustainable regional development. The actors

involved have their own visions, missions and agendas, but in collaborating, they come to a shared vision. Sharing resources and creating knowledge influence the actors to co-create a vision in which their aspirations and needs are not only represented but are also addressed.

Critical success factors to achieve transformative regional development

Drawing on the literature (Olsson and Galaz 2012; Jessop et al. 2013; García et al. 2015; Spijker and Parra 2018), it is possible to identify four critical success factors which are needed to ensure that, when bottom-linked governance is enacted, it will lead to transformative social-ecological regional development.

1. *Acknowledge that the interests of local communities (needs, desires, aspirations), and the social-ecological context (conflicts, crises, opportunities and challenges) will change over time.* When local initiatives take hold, and there is a governance arrangement that is flexible, communities will push for the satisfaction of their needs and the materialization of their desires. This may lead to this being achieved, but also to a change in their concerns. Transformative social innovation is an iterative process that reveals opportunities to change, while inspiring and initiating change.

2. *Acknowledge that only by scaling-up and/or rolling-out at multiple levels will local action deliver better sustainability outcomes.* Innovative initiatives at the local level are interesting, but to truly contribute to sustainability and to be transformative, they have to operate at wider levels. When local knowledge is mobilised to tackle local challenges and is accompanied by resources from formal institutions, it can lead to wider and multilevel outcomes.

3. *Acknowledge that formal institutions are necessary to enable and sustain transformation.* Through the support of formal institutions, social innovation initiatives can gain the resources needed to continue innovating. Formal institutions, especially those with proactive characteristics (e.g. open-mindedness, flexibility, willingness to take risks, and trust in community engagement), are key to developing policies and regulations to guide enhanced regional development and future social innovation.

4. *Acknowledge the need for sharing power and decision making in the governance system.* To achieve transformation in the system, social innovation actions need to navigate across political levels, geographical scales and industry sectors. Sharing knowledge and decision-making, and distributing tasks and resources, promotes cooperation, conflict resolution, and the empowerment of all actors. To establish an ongoing process of transformative social innovation, the actors in bottom-up initiatives need to be empowered, requiring endorsement from the state.

Background information about the Huetar-North region of Costa Rica and ADEZN

Huetar-North is a rural region on the border with Nicaragua, 9,800 km^2, and with 327,000 inhabitants, representing 19% of the area and only 7% of the population of Costa Rica. The region cuts across eight municipalities. Within its boundaries there are seven natural protected areas and one Indigenous reserve. The main economic activities are agriculture, dairying, cattle grazing and fishing.

In Costa Rica, there are only two levels of government: national and municipal. However, so-called 'regions' were created in 1978 to assist national planning. Despite being intended to facilitate planning, there was a degree of identification with and cohesion within most regions. This happened for two reasons. First, the regions tended to demarcate areas with similar characteristics. Second, it had been perceived that the needs of rural areas were being neglected and the creation of regions was believed to be a mechanism to address rural issues (Brugger 1982). These two reasons spawned a wide range of social movements, local organisations and cooperatives seeking to improve local development, especially in the Huetar-North region, eventually providing many examples of social innovation initiatives.

Applying our analytical framework to ADEZN

The background triggers for social innovation

In 2000, many local entrepreneurs felt that there were only limited opportunities to develop their businesses. The local branch of the Costa Rica Technical University (TEC) voiced concern about the lack of attention from the central and local government about the underdevelopment of the region. This triggered the San Carlos Chamber of Commerce (SCCC) to advocate developing an industrial park to attract foreign investment. It called on regional actors to discuss the idea, and brought together the TEC, private sector, local governments and local agencies of the national government. These local actors then established a new group with representatives from all sectors.

This initiative decided to bring their concerns to the national government, together with the idea for an industrial park. Its representatives arranged meetings with ministers, the National Chamber of Commerce, the Chamber of Industries, and managers of other industrial parks in Costa Rica. The outcomes of these meetings were disappointing because the key stakeholders made them realise that there was no competitive advantage for foreign capital to invest in the region. Furthermore, the stakeholders identified flawed logic in the idea, suggesting that efforts would be better directed towards enhancing existing regional activities: agroindustry and tourism. The stakeholders also highlighted local deficiencies: inadequate public infrastructure; a low level of formal education; the

absence of English language skills; limited opportunities for leisure; and the lack of opportunity to add value to agro-products. Nevertheless, they were surprised that such a heterogeneous group of local actors came together, not just with a concern, but with a proposition.

Initiating mechanisms: social innovation and bottom-linked governance

Social innovation

Despite the negative opinion of the proposal by the stakeholders, the emerging social innovation initiative still felt they had a pressing need to do something for rural development. Additional local meetings were held to analyse possible development scenarios and alternative projects. Each time, more and more people joined, to listen, to offer their time and resources, and to contribute to building a regional vision. The process was facilitated by the TEC Rector and SCCC President. Staff from the local agencies of national government were key players who linked the needs and concerns of the various actors with existing development programs and available resources.

The combination of public, private, community and academy actors in participatory spaces of the initiative promoted a cohesive environment with a common aspiration: the enhancement of their region. These elements – the combination of actors, a cohesive environment and common aspiration – facilitated the sharing and improvement of individual knowledge and capabilities of all actors. These three elements were important ingredients in the social innovation initiative. ADEZN was born in 2001 as a not-for-profit organisation. Two years later, ADEZN was declared 'a public utility in the interests of the State' giving it the right to receive funding from public and private sources, and to use public property and public servants for the purposes of regional sustainable development (Asamblea Legislativa).

On its website, ADEZN (http://www.adezn.org) defines itself as an independent regional development agency that seeks to improve the quality of life of people in the Huetar-North region by facilitating collaboration to achieve sustainable productivity, and to improve the territorial conditions to increase the competitiveness of local businesses. Since its inception in 2001, ADEZN has worked on around 40 projects, such as building new public infrastructure, developing new tourism products, enhancing local government capacity, value-adding to agriculture, and work-ready schemes in educational institutions.

ADEZN considered that two infrastructure projects were its flagships: the Tablillas customs post and border crossing; and the national road from Chilamate to Vuelta de Kooper. ADEZN identified that these projects were critical for the development of the Huetar-North region. Both projects facilitated communication, collaboration and exchange between regions in Costa Rica and with Nicaragua (see Figure 3.2). ADEZN championed these projects, lobbied for them, and facilitated the networks of actors necessary for the projects to be successful.
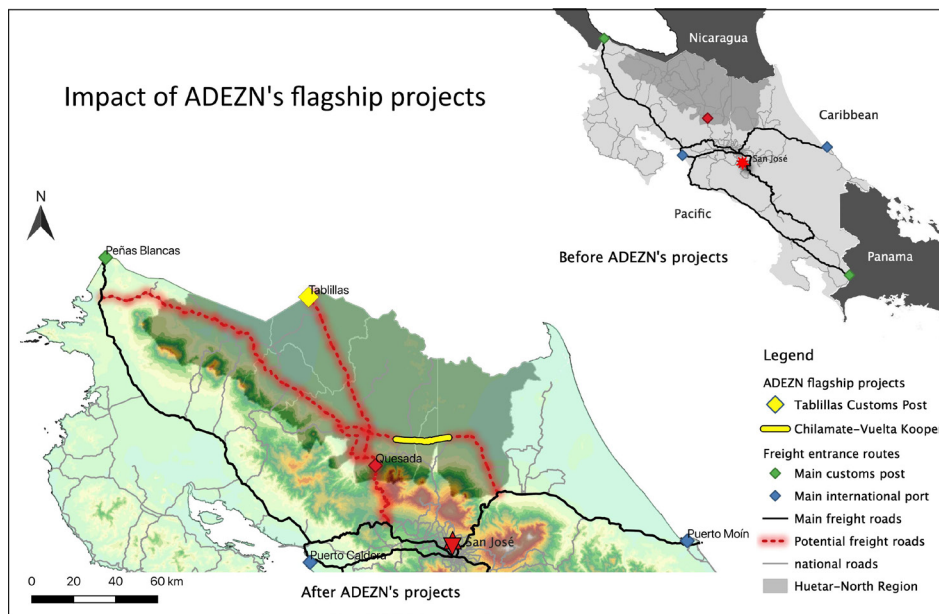
Figure 3.2. Location of ADEZN flagship projects and their impact on the movement of goods within the rural region, the country and international context.

(Source: author based on geographical information data available at http://www.snitcr.go.cr/, supplemented with the analysis from LANAMME-UCR 2015)

The national road from Chilamate to Vuelta de Kooper was a 27 km road that opened in 2017. It was built to significantly shorten the distance and time taken for freight to be transported from the Caribbean seaport, Moín, to Nicaragua. Although the road had been planned since 2005, it lacked sufficient political support. ADEZN strongly campaigned for the project given that the road enhanced the movement of goods between the three northern regions of Costa Rica (Guanacaste, Huetar-North, and Huetar-Atlantic), bypassing the capital city area. Taking 7 years to construct, it cost USD 74 million.

We consider that ADEZN is a good example of social innovation. Various criteria about how to identify social innovation have been developed (e.g. Murray et al. 2010; Neumeier 2017) and could be used to test whether an initiative qualifies as a social innovation. We applied the criteria elaborated by Moulaert et al. (2005; 2013) – as further tested by Castro-Arce et al. (2019) – namely, that to be a social innovation, an initiative must foster: satisfaction of needs; changes in socio-political arrangements; and empowerment. We consider that ADEZN fulfilled these criteria in that it: (a) acted towards the satisfaction of local interests and needs that had not been properly addressed by the national or local governments; (b) provoked changes in regional governance by providing a new and unique participatory space in which varied actors from bottom-up and top-down contributed ideas and resources; and (c) fostered empowerment of actors by promoting shared decision-making and the enhancement of knowledge.

Bottom-linked governance

ADEZN created a space for decision-making about the rural region, not by changing the formal structures of government, but in the way planning was practiced. The resultant bottom-linked governance in the Huetar-North region can be seen as both an outcome of social innovation, and as a socially-innovative space of action (Pradel et al. 2013; Spijker and Parra 2018). As an outcome, bottom-linked governance was provoked by the reconfiguration of the social relations and political arenas due to the dynamic, interconnected networks developed by ADEZN. It transformed a very traditional top-down governance structure, into an environment in which the private sector, academy and community could participate with government. It also encouraged local governments to think and act beyond their municipal boundaries by cooperating with each other and other political levels for greater impact. As a socially-innovative space of action, ADEZN boosted collaboration between sectors, scales and levels, which is key to achieving regional goals. As highlighted by our interviewees, ADEZN fostered additional initiatives, including: a Regional Council for Water and Environment; a Council for Industry and Productivity; a Culture Council; and an Education Council.

Conditions for the success of bottom-linked governance

Given that ADEZN has been successful in most of its projects, it might be expected that they adequately addressed the conditions identified earlier, i.e. the enabling factors and critical success factors of bottom-linked governance. However, although our interviews gave the impression that these conditions were met, this was often done inadvertently rather than deliberately, as we discuss below.

Bridging roles as enabling factors of bottom-linked governance

Network enabler: ADEZN enabled networks in three ways. First, it had an internal structure that consisted of thematic groups and projects. Each thematic group and project team comprised actors coming from the private sector, community, public sector, and academy. Each project was also a network in that the project team had an organic, flexible structure that incorporated actors from the appropriate sectors and levels, as well as anyone who wanted to participate. Second, the process of developing each project revealed the interconnectedness between the project and community, and with other projects and actors. Because they had intertwined interests, actors in each project team developed new and/or enhanced relations with other actors, supporting the satisfaction of the interests of others. In this way, ADEZN become a support network for the enhancement of the whole region, with impacts at national and transboundary levels. Third, in developing the various projects, limitations (e.g. jurisdictional issues, financial means, adequate personnel, procurement procedures, etc) became evident. ADEZN and the project networks supported the public sector by connecting-up the formal institutions and in developing new local networks, putting several public institutions into dialog with each other. As an external actor, ADEZN provided the public institutions with a safe space they could use to share knowledge and resources.

Knowledge broker: ADEZN had the capacity to encourage the vertical sharing of information between the bottom-up and top-down, but also horizontally across sectors. Through ADEZN's various discussion platforms, the local communities were able to share their needs, desires and aspirations, as well as concerns and doubts. ADEZN often voiced these concerns and interests at higher levels. Because of this, the organizations generally took action to address these issues. Within the project networks, actors communicated with others from different sectors, sharing their aspirations, needs and concerns about the projects, the region, or their own capabilities and resources. Through these vertical and horizontal processes, information and knowledge were transferred from one community to another, and from one actor to another. When limitations in capacity were detected, ADEZN invested in improving social and institutional capacities and in encouraging the diverse abilities of actors. This knowledge pool, built on sharing and translating, also helped to develop the continuous improvement of ADEZN's processes and organizational structure, thus creating knowledge that benefited all actors. ADEZN's actions modified the conditions in which the interests arose, and facilitated transformations to achieve better outcomes.

Resource broker: Most projects ADEZN pushed were executed using public funds. ADEZN closely supervised each project, helping to detect when and where resources were needed, anticipating problems, and being efficient in decision-making. Formal institutions benefited because they allocated public funds more efficiently. ADEZN endorsed projects that had community support, linking local interests to the national and regional development plans. For the private sector, there were benefits from each project, both direct and indirect. For example, in Chilamate-Vuelta Kooper road project, the leader was an entrepreneur who owned hardware stores across northern Costa Rica. He needed this road to expand his business and to transport goods more efficiently. In Tablillas Customs Post, the leader was a forestry investor with land over the border in Nicaragua, and needed to export lumber through Costa Rica. With ADEZN stimulating public projects, the resources needed for every action necessary to realize the project may not be available. This is where ADEZN played a key role in enhancing wider networks to identify and provide resources. Examples of these contributions include: voluntarily contributing to feasibility reports, environmental impact assessments, and other technical studies; providing experts for planning workshops; and designating personnel or office resources to support the process. By combining the contributions from the various sectors and political levels, ADEZN promoted win-win-win situations in which resources and benefits were managed more efficiently.

Transparency and conflict resolution agent: Over time, ADEZN organized accountability processes that enabled scrutiny by all actors. It put in place three key principles: exclusion of political parties; no involvement in the management of the projects; and disclosure of the members of project groups and of any vested interests they may have. However, it was expected that the project leader would be a *doliente* (mourner), meaning that they were expected to have a direct personal economic interest in the project and thus would suffer or mourn if the project would not succeed (as highlighted before in the resource broker analysis). This ensured that they would strive hard for its success, and be the project's champion. Having this commitment to success meant

that project leaders and ADEZN identified innovative ways to address project issues that eventuated. For example, when landowners were dissatisfied with the compensation amounts for expropriated land, which threatened the success of the two flagship projects, ADEZN engaged an independent valuer to adjudicate. These principles and socially-innovative actions fostered trust. The work that ADEZN did in keeping track, lobbying, finding funds and solving conflicts was very useful for all actors. It might have been expected that ADEZN would have a mechanism for resolving internal conflict. However, according to our interviewees, there was no formal mechanism, partly because they had never encountered a situation which warranted it. When quizzed about this, one of the executives said that this was because ADEZN had adequate means to ensure that conflict was dispelled before it arose, particularly because there were ample deliberative spaces for issues to be discussed, which led to a strongly-shared common vision, and that they spent a lot coffee time together and with all the various actors.

Shared vision champion: As a bridging social innovation, ADEZN not only bridges actors, knowledges and resources, but also aspirations. ADEZN was born from the concerns of individuals about the underdevelopment of their region. While advancing their own interests, the participants built a common shared vision for their future, and the future of future generations. Over the years, ADEZN had been increasingly attracting actors with strong aspirations to forge their ideal of the region. The dynamic nature of ADEZN allowed for projects from different action arenas and sectors to be supported, such as: regional development curricula and work-ready schemes in educational institutions; public-private partnerships; the supply of agricultural by-products; improvement in governance processes and decision-making; landuse planning; the planning of infrastructure; and the management of natural resources.

Critical success factors of bottom-linked governance

Acknowledge that the interests of local communities and the social-ecological context are likely to change over time. As a social innovation initiative, ADEZN was triggered by specific interests at the time. However, the success of projects inspired individuals, communities, and other actors to conceive of new ideas, with changing interests, priorities, and projects over time. Social innovation changed the governance system, therefore the actions and strategies pursued by ADEZN needed to be revisited in order to continue to be effective, as revealed by one interviewee:

> "We now understand that ADEZN's mission is a long-term process. In the beginning, we thought it was just a short-term action … There was some jealousy towards ADEZN from some entities, so we had to slow down, talk among the associates, make decisions about what needs we have and what goals to pursue, and re-introduce ourselves to higher political levels. This is how we came to realize that regional development is a long-term process. Today, we are proposing projects that we [as individuals] may never see finished, like an airport or railroad, but are there because of changes in the context and priorities." (interview 2015-08-25 with a long-term member of ADEZN)

Acknowledge that only by scaling-up and/or rolling-out at multiple levels will local action deliver better sustainability outcomes. The two flagship projects of ADEZN were pre-existing government projects that didn't have enough political commitment when they were originally proposed. Due to the actions of ADEZN, both projects were placed back on the national agenda. This was possible due to the capacity of ADEZN to scale-up their interests and proposed projects.

> "The centrality of the political/administrative structure of the country meant that our primary audience was the central government. We need to be heard at that level. At the local level, we have to influence particular actors. Our other audience, at the regional level, is the academy. They can reach the whole region. At the local level, our audience is not the neighbourhood development associations, but the leaders of the communities and businesses, and the public sector middle managers from the government local agencies. This is the only way to make our work reverberate and create impact at the national level." (interview on 2015-08-31 with a long-term member of ADEZN).

For local social innovation actions to be rolled-out and supported by national agencies requires acceptance that local actors may know better, trust in local organizations, and willingness to experiment.

> "There were some sections [within the public sector] afraid of the experimentation with local public-private partnerships, but others thought of it as a spearhead for regional development. [One of ADEZN's executives] came in at the right moment, it was like music to the ears. There was will from the Ministry to develop public policy towards poverty reduction aligned with improvements in regional competitiveness. So, I supported ADEZN and asked [the ADEZN executive] to help with other initiatives in Limón and Guanacaste, so they could create something similar to ADEZN." (interview on 2015-10-26 with a former Minister)

Acknowledge the necessity of having formal institutions that enable and sustain transformation. All actors involved in bottom-linked governance need to recognise and support the role of public institutions in achieving sustainable regional development. Resources from the central and local governments are essential when developing projects of wider regional impact.

> "The local initiatives propose what they want in term of their needs, but usually they do not know how to achieve them. We provide technical knowledge to define with them the roadmap. Social initiatives emerge, but planning the territory is the responsibility of the State. Local innovation is not a complete solution in itself, as these initiatives are only localised efforts. Together, we need to place them within the strategies of the nation and region, if we want to produce real outcomes." (Interview on 2015-10-01 with a department coordinator from the Ministry of Foreign Commerce)

Acknowledge the need for a governance system in which power and decision-making is shared. In a bottom-linked governance system, the actors come together to collaborate for the benefit of all. The success of these collaborations depends on a delicate balance between the distribution of power and decision-making. The success of transformative social innovation is dependent on the level of trust among actors, and their ability to address difficulties.

"We don't want politicians to be part of ADEZN because they will take over and direct it towards their interests, and ADEZN will last only while it is useful to them. The local actors need to be kept in the management of ADEZN. On the other hand, if ADEZN becomes public, then the Ministry of Finance will control everything, and we will lose flexibility and participation. Local actors need to be empowered. We need to have a say, and be able to act in the interests of our regional development. But, we have to be careful with the private sector, and prevent that strong entrepreneurs, with lots of money, take control, as this will not be in the benefit of the local communities. There needs to be a balance in the sharing of power." (Interview on 2015-08-07 with a long-term member of ADEZN)

Transformative processes and regional outcomes: drawing lessons from the case

Although it is too much to claim that Costa Rica, or the relatively under-developed Huetar-North region, have achieved an ideal state of social-ecological regional development, it is clear that ADEZN has contributed to transformative processes, especially to transformative regional governance and changes in the knowledge, attitudes, skills and aspirations (KASA change) of the actors. Transformative regional governance is considered to be an effective and participatory regional governance that leads to profound change in system functioning and the state of the system (Chaffin et al. 2016). Transformative regional governance includes adaptive governance, and changes in planning practice. Because assessing the contribution of social innovation to the overarching regional social-ecological outcomes (sustainability, resilience and societal wellbeing) may be difficult, identifying changes in governance and planning practice, and in KASA change, can provide evidence of the success of transformative social innovation (Vanclay 2015).

Changes in knowledge, attitudes, skills and aspirations (KASA change)

As a result of ADEZN, knowledge has increased in various ways at all levels, sectors and actors in the governance system, especially: knowledge about the region and how development occurs; knowledge about participation, participatory processes, and the actors involved; knowledge about assets and resources, and how to mobilise them; knowledge about political domains, roles, functions, and how to influence them; and knowledge about elite capture, rent seeking, and how to control it.

In general, the attitudes of ADEZN participants became more positive and more confident over time. They become more committed to collaborative projects and they learned to trust themselves and others more. They felt empowered. Success exuded from them, attracting attention, and more people wanted to become actively involved.

As a result of its expanding networks, the level and type of skills within ADEZN increased. People in the networks and project teams also learnt new skills and developed confidence.

Skills in advocacy and political negotiation grew. For example, ADEZN's two executives become very effective in cooperating and, because they came from (and were paid by) different institutions, they learned how to effectively counterbalance their interests.

The aspirations of all actors changed as they became more confident and realised that they could successfully achieve things. They shifted in thinking that an industrial park would boost their rural region, to becoming the agents of that boost themselves. The increase in knowledge and the success of ADEZN inspired greater aspirations, personal and collective, for a more sustainable rural region.

Transformative regional governance and planning practice

ADEZN was a good example of how social innovation has the potential to be transformative. Since its origins in 2001, ADEZN developed as a rural social innovation initiative with bridging abilities. Although the primary motivation of ADEZN was to improve local wellbeing, it was clear from the beginning that acting for sustainable regional development involves changing hegemonic socio-political structures, therefore profound change was needed. Social innovation stimulated bottom-linked governance that was enabled by bridging roles, and was able to be transformative through recognition by all actors of the factors critical for its success. The bridging roles contributed to the emergence and maintenance of a linked middle-ground where various actors, interests and aspirations converged. ADEZN had influence on other institutions, both formal and informal, on the governance of the region, and on the degree of empowerment of each actor. Recognition of continuous change, the capacity of local organisations, the interdependencies between public and private, and the need for shared decision-making helped the actors transcend the local sphere and provoke transformation at regional and national scales.

ADEZN's actions had an impact on the practice of rural community planning. Transformative social innovation reconfigures social relationships and empowers actors. This was proved by ADEZN, as a self-organised and bottom-linked initiative. The varied actors who participated in the initiative discussed possible development scenarios and projects that lead them to achieve their common vision. In doing so, ADEZN put sectors and political levels that were not typically involved with each other, into dialog and collaboration. As highlighted before, without changing the formal planning structures, ADEZN provided a space in which public institutions collaborated with local communities, entrepreneurs and the academy. Rural planners – i.e. servants from government local agencies responsible for rural development – were key actors, as they were able to connect existing wider development programs and available resources with the needs and concerns of local communities.

The success of a transformative social innovation is dependent on the level of trust among the actors, and their ability to address difficulties. Cronyism and elite capture (political or regulatory capture) is a valid concern in rural contexts. The framework addresses this concern both in the characteristics of the bridging roles and the need for recognition of

the importance of the active collaboration between the State, communities and other parties, such as the academy and the private sector. The actions of ADEZN, the way they were organised, and their acknowledgement of the critical factors, which was revealed by some interviewees, illustrated a very clear path for other social innovation initiatives. Part of the success of ADEZN was that their members and the participants in general need to be transparent regarding the interests each have in the region, and in the projects they endorse. ADEZN also had clear rules about no participation of politicians, and that the projects need to have community support and positive community impact.

The transformations fostered by ADEZN contributed towards more adaptive regional development. The governance dynamics stimulated by ADEZN actively involved various actors, embraced diversity in interests, values and perspectives, and served as a space for conflict resolution and the building of trust. Through the actions of ADEZN, the rural region benefitted from combining knowledge and experience.

Conclusion

The ultimate goal of planning and regional governance processes is to achieve social-ecological development. High level, overarching outcomes, such as sustainability, resilience and societal well-being, are expected. To reach these lofty outcomes, transformation in the governance system and in people is needed. Transformative regional governance involves changes in rules, planning practice, and governance structures. Social innovation creates, renews and transforms social relations in the development of new ways of working together to achieve societal goals. Therefore, social innovation has the potential to foster regional transformation that contributes to social-ecological development. But not all social innovation initiatives are transformative. Our research showed that transformative social innovation is developed through bottom-linked governance mechanisms. Social innovation is triggered by local interests, and by the context in a particular time and place. As our social innovation exemplar, ADEZN, demonstrated, when social innovation addresses more than just immediate pressing issues, and actively searches for new sustainability pathways, it will transcend and be instrumental in societal transformation.

Our framework for transformative social innovation proved to be effective for analysing initiatives of social innovation and, as a result, for understanding and revealing how social innovation contributes to system change. We argued that regions, particularly rural regions, need to be understood as social-ecological systems, and therefore their governance should aspire to become adaptive, enabling more inclusive and effective planning. Not just linking bottom-up and top-down, but creating a space for collaboration is essential if planning practice is to address major sustainability challenges. Social innovation enables such a space by developing bottom-linked governance.

We established that bottom-linked governance is enabled by the five key bridging roles: network enabler, knowledge broker, resource broker, transparency and conflict resolution

agent, and shared vision champion. The bridging roles all have to be played by social innovation initiatives if they are to effectively achieve the desired outcomes. These bridging roles provide social innovation initiatives with the ability to scale-up, become part of a multi-level governance system and, more importantly, to profoundly affect regional development. We also revealed that, in order to be successful in transforming regional development, bottom-linked governance must address four critical success factors: that the interests of local communities and the social-ecological context will change over time; that only by scaling-up and rolling-out at multiple levels will local action deliver better sustainability outcomes; that formal institutions are necessary to enable and sustain transformation; and that there has to be a sharing of power and decision making in the governance system. Only by acknowledging these factors will social innovation transcend and contribute to transformation that achieves social-ecological regional development.

For illustrative purposes, we applied our framework to ADEZN, an independent rural development agency in the Huetar-North region of Costa Rica. We used their story to discuss each part of the framework. The story of ADEZN showed how a local social innovation can become transformative by engaging with actors and agents at different political levels, geographical scales and industry sectors, and by developing a bottom-linked governance system. Our analysis showed that ADEZN had contributed to an improved and adaptive regional governance system, and that there had been KASA change in many actors, i.e. the process of change in people's knowledge, attitudes, skills and aspirations. However, despite ADEZN adequately addressing the enabling factors and critical success factors, this was done inadvertently, a typical feature of a self-organised initiative.

Our analytical framework offers insights to researchers of social innovation, rural community planning and regional sustainable development. Our framework is intended to be used with other social innovation initiatives in different geographical contexts to enable understanding of the particular processes that make each initiative successful or why they are not successful. Some key questions might be: Do successful examples of transformative social innovation comply with all factors in the framework? What can be learnt from the differences between cases? Are there differences between a self-organised initiative (e.g. ADEZN) and one that is more formally structured (e.g. ones participating in LEADER/CLLD programs)? Is bottom-linked governance a mechanism through which planning practice will become more transdisciplinary?

Finally, we consider our framework to be a roadmap for planning practitioners, policy makers and social innovation initiatives to guide their efforts and resources in fostering transformative social innovation. We recommend that these stakeholders consider the factors we identified – the five bridging roles and the four critical success factors – and act in response to them. When social innovation initiatives develop bottom-linked governance and acknowledge these factors they will have the potential to be transformative and to successfully contribute to sustainable rural development.

References

Allen, J., Massey, D. and Cochrane, A. 1998. *Rethinking the region*. New York: Routledge.

Asamblea Legislativa *Declaración de interés público de las actividades de la Asociación Agencia para el Desarrollo de la Región Huetar Norte y autorización de la administración pública para que done recursos económicos y establezca convenios con esta asociación*. Costa Rica: La Gaceta 129, date 07-07-2003.

Avelino, F. et al. 2019. Transformative social innovation and (dis)empowerment. *Technological Forecasting and Social Change* 145, pp. 195–206.

Avelino, F., Wittmayer, J.M., Kemp, R. and Haxeltine, A. 2017. Game-changers and transformative social innovation. *Ecology and Society* 22(4), art41.

Baker, S. and Mehmood, A. 2015. Social innovation and the governance of sustainable places. *Local Environment* 20(3), pp. 321–334.

Barnes, M.L., Bodin, Ö., Guerrero, A.M., McAllister, R.R.J., Alexander, S.M. and Robins, G. 2017. The social structural foundations of adaptation and transformation in social-ecological systems. *Ecology and Society* 22(4), art16.

Berkes, F. 2009. Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of environmental management* 90(5), pp. 1692–702.

Berkes, F., Colding, J. and Folke, C. eds. 2003. *Navigating social-ecological systems. Building resilience for complexity and change*. Cambridge, UK: Cambridge University Press.

Biggs, R., Westley, F. and Carpenter, S. 2010. Navigating the back loop: Fostering social innovation and transformation in ecosystem management. *Ecology and society* 15(2), art9.

Bock, B. 2012. Social innovation and sustainability: How to disentangle the buzzword and its application in the field of agriculture and rural development. *Studies in Agricultural Economics* 114(2), pp. 57–63.

Bock, B. 2016. Rural marginalisation and the role of social innovation: A turn towards nexogenous development and rural reconnection. *Sociologia Ruralis* 56(4), pp. 552–573.

Brown, L.D. 1991. Bridging organizations and sustainable development. *Human Relations* 44(8), pp. 807–831.

Brugger, E.A. 1982. Regional policy in Costa Rica: The problems of implementation. *Geoforum* 13(2), pp. 177–192.

Butler, J.R.A. et al. 2015. Integrating top-down and bottom-up adaptation planning to build adaptive capacity: A structured learning approach. *Coastal Management* 43(4), pp. 346–364.

Castro-Arce, K., Parra, C. and Vanclay, F. 2019. Social innovation, sustainability and the governance of protected areas: Revealing theory as it plays out in practice in Costa Rica. *Journal of Environmental Planning and Management*, 62(13), pp. 2255–2272.

Chaffin, B.C. et al. 2016. Transformative environmental governance. *Annual Review of Environment and Resources* 41(1), pp. 399–423.

Chaffin, B.C., Gosnell, H. and Cosens, B.A. 2014. A decade of adaptive governance scholarship: Synthesis and future directions. *Ecology and Society* 19(3), art56.

Cooper, S.J. and Wheeler, T. 2015. Adaptive governance: Livelihood innovation for climate resilience in Uganda. *Geoforum* 65, pp. 96–107.

Crona, B.I. and Parker, J.N. 2012. Learning in support of governance: Theories, methods, and a framework to assess how bridging organizations contribute to adaptive resource governance. *Ecology and Society* 17(1), art32.

Davoudi, S. 2012. Resilience: A bridging concept or a dead end? *Planning Theory & Practice* 13(2), pp. 299–307.

Dax, T. 2006. Endogenous development in Austria's mountain regions. *Mountain Research and Development* 21(3), pp. 231–235.

Dax, T., Strahl, W., Kirwan, J. and Maye, D. 2016. The Leader programme 2007–2013: Enabling or disabling social innovation and neo-endogenous development? Insights from Austria and Ireland. *European Urban and Regional Studies* 23(1), pp. 56–68.

Dietz, T., Ostrom, E. and Stern, P.C. 2003. The struggle to govern the commons. *Science* 302(5652), pp. 1907–1912.

Folke, C. 2006. Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change* 16(3), pp. 253–267.

Folke, C., Hahn, T., Olsson, P. and Norberg, J. 2005. Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources* 30(1), pp. 441–473.

García, M., Eizaguirre, S. and Pradel, M. 2015. Social innovation and creativity in cities: A socially inclusive governance approach in two peripheral spaces of Barcelona. *City, Culture and Society* 6(4), pp. 93–100.

Hahn, T., Olsson, P., Folke, C. and Johansson, K. 2006. Trust-building, knowledge generation and organizational innovations: The role of a bridging organization for adaptive comanagement of a wetland landscape around Kristianstad, Sweden. *Human Ecology* 34(4), pp. 573–592.

Imperiale, A.J. and Vanclay, F. 2016. Experiencing local community resilience in action: Learning from post-disaster communities. *Journal of Rural Studies* 47, pp. 204–219.

Jessop, B., Moulaert, F., Hulgård, L. and Hamdouch, A. 2013. Social innovation research: A new stage in innovation analysis? In: Moulaert, F., MacCallum, D., Mehmood, A. and Hamdouch, A. ed. *The International Handbook of Social Innovation Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 110-132.

Kowalski, A.A. and Jenkins, L.D. 2015. The role of bridging organizations in environmental management: Examining social networks in working groups. *Ecology and Society* 20(2), art16.

LANAMME-UCR 2015. *Evaluación del Corredor Logístico Norte Caribe*. Available at: www.lanamme.ucr.ac.cr/index.php/ultimas-noticias/1161-corredor-log%C3%ADstico.html

Mangabeira Unger, R. 2015. Conclusion: The task of the social innovation movement. In: Nicholls, A., Simon, J., and Gabriel, M. eds. *New Frontiers in Social Innovation Research*. London: Palgrave Macmillan UK, pp. 233–251.

McGowan, K. and Westley, F. 2015. At the root of change: The history of social innovation. In: Nichols, A., Simon, J., and M., G. eds. *New Frontiers in Social Innovation*. Hampshire & New York: Palgrave Macmillan, pp. 52–68.

Mehmood, A. and Parra, C. 2013. Social innovation in an unsustainable world. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook of Social Innovation Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 53–66.

Menzel, S. and Buchecker, M. 2013. Does participatory planning foster the transformation toward more adaptive social-ecological systems? *Ecology and Society* 18(1), art13.

Molden, O., Abrams, J., Davis, E.J. and Moseley, C. 2017. Beyond localism: The micropolitics of local legitimacy in a community-based organization. *Journal of Rural Studies* 50, pp. 60–69.

Moulaert, F., MacCallum, D., Mehmood, A. and Hamdouch, A. 2013. General introduction: The return of social innovation as a scientific concept and a social practice. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 1-6.

Moulaert, F., Martinelli, F., Swyngedouw, E. and Gonzalez, S. 2005. Towards alternative model(s) of local innovation. *Urban Studies* 42(11), pp. 1969–1990.

Moulaert, F., Mehmood, A., MacCallum, D. and Leubolt, B. 2017. *Social Innovation as a trigger for transformations -The role of research*. Luxembourg.

Murray, R., Caulier-Grice, J. and Mulgan, G. 2010. *The open book of social innovation*. UK: The Young Foundation, NESTA.

Neumeier, S. 2012. Why do social innovations in rural development matter and should they be considered more seriously in rural development research? – Proposal for a stronger focus on social innovations in rural development. *Sociologia ruralis* 52(1), pp. 48–69.

Neumeier, S. 2017. Social innovation in rural development: Identifying the key factors of success. *The Geographical Journal* 183(1), pp. 34–46.

Novy, A. 2017. Transformative social innovation. *SRE-Discussion. Multilevel Governance and Development* (05). Available at: http://epub.wu.ac.at/5619/

Olsson, P. and Galaz, V. 2012. Social-ecological innovation and transformation. In: *Social innovation. Blurring Boundaries to Reconfigure Markets*. London: Palgrave Macmillan UK, pp. 223–247.

Ostrom, E. 2005. *Understanding institutional diversity*. Princeton, NJ: Princeton University Press.

Ostrom, E. and Cox, M. 2010. Moving beyond panaceas: A multi-tiered diagnostic approach for social-ecological analysis. *Environmental Conservation* 37(04), pp. 451–463.

Paasi, A. 2013. Regional planning and the mobilization of 'regional identity': From bounded spaces to relational complexity. *Regional Studies* 47(8), pp. 1206–1219.

Parés, M., Ospina, S. and Subirats, J. 2017. *Social Innovation and Democratic Leadership*. Edward Elgar Publishing.

Pires, A. da R., Pertoldi, M., Edwards, J. and Barbara Hegyi, F. 2014. *Smart specialisation and innovation in rural areas*. Seville.

Pradel, M., García, M. and Eizaguirre, S. 2013. Theorizing multi-level governance in social innovation dynamics. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook of Social Innovation Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 155–168.

Spijker, S.N. and Parra, C. 2018. Knitting green spaces with the threads of social innovation in Groningen and London. *Journal of Environmental Planning and Management* 61(5–6), pp. 1011–1032.

Taylor, B. and de Loë, R.C. 2012. Conceptualizations of local knowledge in collaborative environmental governance. *Geoforum* 43(6), pp. 1207–1217.

Vanclay, F. 2015. The potential application of qualitative evaluation methods in European regional development: Reflections on the use of performance story reporting in Australian natural resource management. *Regional Studies* 49(8), pp. 1326–1339.

Vanclay, F., Baines, J.T. and Taylor, C.N. 2013. Principles for ethical research involving humans: Ethical professional practice in impact assessment Part I. *Impact Assessment and Project Appraisal* 31(4), pp. 243–253.

Westley, F., McGowan, K. and Tjörnbo, O. 2017. The history of social innovation. In: Westley, F., McGowan, K., and Tjörnbo, O. eds. *The Evolution of Social Innovation Building Resilience Through Transitions*. Edward Elgar Publishing, pp. 1–17.

Westley, F.R., Tjornbo, O., Schultz, L., Olsson, P., Folke, C., Crona, B. and Bodin, Ö. 2013. A theory of transformative agency in linked social-ecological systems. *Ecology and Society* 18(3), art27.

Wilkinson, C. 2012. Social-ecological resilience: Insights and issues for planning theory. *Planning Theory* 11(2), pp. 148–169.

CHAPTER

4

COMMUNITY-LED GREEN LAND ACQUISITION

Abstract

Land acquisition often involves power and displacement, and can be carried out on a large scale. There are many forms of land acquisition, including for environmental and conservation purposes, as well as for production activities. While green grabbing has joined land grabbing as an environmental justice issue of concern, it is not necessarily the case that all green land acquisition is large scale, done by powerful outsiders, or leads to displacement and exclusion. The outcomes of green land acquisition are dependent on the mechanisms used, the adequacy of resettlement and/or compensation, and the social and environmental context in which it happens. We discuss the outcomes of community-led land acquisition for conservation purposes in Costa Rica. We considered a special case of green land acquisition done by local civil society to defend the forest and water resources of the Juan Castro Blanco National Water Park in Costa Rica. We used the literature on green grabbing, social ecological systems and social innovation to discuss local environmental governance and regional sustainable development. This paper makes a fresh contribution to environmental planning and environmental governance by bringing in aspects of green land acquisition that have not been previously explored.

Keywords: environmental planning; environmental governance; land grabbing; green grabbing; sustainable regional planning; protected area management; land use management; social innovation; social-ecological systems.

Community-led green land acquisition: Social innovative initiatives for forest protection and regional development

Introduction

Green land acquisition is the process of acquiring land for environmental, conservation or biodiversity preservation purposes (Fairhead et al. 2012; Vanclay 2017a). Often this involves the exercise of power, displacement, dispossession and exclusion in the accumulation of large tracts of land by governments, transnational corporations, NGOs, or (conservation) trust funds (Vanclay 2017a). It usually involves the taking of land from local communities, creating considerable social harm, and tends to be called 'green grabbing' (Benjaminsen and Bryceson 2012; Borras et al. 2012; Vanclay 2017b; Busscher et al. 2018; Busscher et al. 2019a; Busscher et al. 2019b). However, green land acquisition is not necessarily always done by powerful outsiders or inevitably leads to dispossession and disenfranchisement (Castree 2011). Various scholars (Castree 2011; Benjaminsen and Bryceson 2012; Fairhead et al. 2012; Vanclay and Hanna 2019) have noted that the outcomes from land acquisition are related to the acquisition process used (e.g. expropriation, negotiated agreement, or 'willing buyer, willing seller'), the effectiveness of any resettlement actions, and the geographical, historical, political, socio-economic and environmental context in which the acquisition takes place.

Potentially, various shades of green can be conceived when appraising green land acquisition (Zoomers 2010; Vanclay 2017a). For example, Franco and Borras (2019) discussed the subtle interconnections between climate change politics and green grabbing pointing out the role of governance, local institutions and domestic corporate actors. Sikor (2012) and Dao (2015) exemplified that considerable land acquisition for rubber plantations in Vietnam was done by local farmers with the support of national development programs. In Indonesia, Pasaribu et al. (2020) identified that local villages were often in favour of forestry and palm oil plantations because of the job opportunities and community social investment programs implemented by the plantation companies. Holmes (2014) explored green grabbing by looking at the relations between private protected areas, nature conservation and resource exploitation in Chile. Xu (2018) exposed the negative consequences of small-scale land acquisition by villagers for farming in China.

In this paper, we explore green land acquisition by using a social innovation lens. We contribute to the green grabbing and land acquisition literature by considering a special case of small-scale green land acquisition done by local civil society in and around a protected area (PA), the Juan Castro Blanco National Water Park in Costa Rica, in order to defend its forest and water resources. In general terms, we consider situations

where land acquisition for environmental purposes is positive, not only for conservation purposes, but also for regional development and local wellbeing. We argue that such local actions are example of social innovation.

Social innovation can be defined as "the creation, renewal or transformation of social relations in the development of new ways of working together to achieve societal goals" (Castro-Arce and Vanclay 2020, p.46). Social innovation occurs when there is a need to address important social and/or social-ecological matters. This means that social innovation is fundamentally a normative concept: it seeks the improvement of community wellbeing, usually but not always the marginalized or those with limited power and resources (Castro-Arce and Vanclay 2020). As Moulaert et al. (Moulaert et al. 2013, p.7) emphasized, social innovation "means fostering inclusion and wellbeing through improving social relations and empowerment processes". In environmental governance scholarship, social innovation is regarded as critical to achieving sustainability and fostering the resilience of social-ecological systems (SES) (Moore and Westley 2011; Diepenmaat et al. 2020; Ravazzoli and Valero 2020). Mehmood & Parra (2013) argued that social innovation connects all sustainability pillars and consequently better conceptualizes and fosters sustainable development. Similarly, Biggs et al. (2010) considered social innovation to be a way of developing more adaptive, integrated ecosystem management practices to improve society's ability to sustainably manage complex social-ecological systems.

Social innovation has been applied as a useful concept to examine the social-ecological enhancement of regions (Castro-Arce and Vanclay 2020), protected areas (Castro-Arce et al. 2019), Indigenous reserves (George et al. 2019), forests and other natural resource territories (Kluvánková et al. 2018; Melnykovych et al. 2018; Nijnik et al. 2019; Sarkki et al. 2019). Despite these examples, social innovation has not been used to analyse green land acquisition. The purpose of our paper is to contribute to an enhanced understanding of social innovation, by focusing on the motivations for and mechanisms to implement green land acquisition.

Methodology

The information presented here is part of a comprehensive qualitative research project about social-ecological regional planning in Costa Rica (Castro-Arce et al. 2019; Castro-Arce and Vanclay 2020). In this paper, we use case study research (Yin 2009; Evans 2011) to explore two community-based organizations (CBOs) that developed social innovation mechanisms to purchase land for conservation purposes in and around the Juan-Castro-Blanco National Water Park. These organisations were the Association for the Protection of the Juan-Castro-Blanco National Water Park (APANAJUCA) and the Association Source Manager of the Aquifers of the Municipality of Alfaro Ruiz (AFAMAAR). Fieldwork was conducted in 2015, with a follow-up in 2019. Given our multiple data sources, we used triangulation to validate information, and to crosscheck the theoretical construction with data interpretation.

Consistent with case study research, multiple research methods were used. First, a total of 39 people were interviewed using semi-structured interviews regarding the governance of the Juan-Castro-Blanco National Water Park and local environmental planning processes. The interviewees were selected using a snowball sampling technique. The interviews were conducted in Spanish, and were audio-recorded so that they could be played-back later. Extensive notes were taken during interviews. Formal informed consent was obtained for all interviews, and other principles of ethical social research were observed (Vanclay et al. 2013). Interviewees included key actors from the two community organizations that are the primary subject of this research, as well as with representatives of cooperatives, NGOs, neighbouring landholders, local producers, municipalities, academics, and the Ministry of Environment and Energy (MINAE). Second, by invitation, the lead author attended a range of formal meetings between key actors, during which notes were taken (with consent of those present). Third, fieldwork research was undertaken, including hiking in the park and visits to local communities accompanied by actors associated with the PA, with observations being recorded in a research diary. In advance of the field visits, notes were written to guide the observations. The purpose of using observation was to see the governance dynamics at play, comprehend the spatial outcomes from the CBO's actions, and assess the social-ecological relations within the Juan-Castro-Blanco. Fourth, archival, legal and other relevant documents and on-line resources relating to the park and the CBOs were analysed. Fifth, we also analysed quantitative data from cartographic and geographic-information systems provided by the municipalities of San Carlos and Zarcero, and other sources.

Description of the case study

The Juan-Castro-Blanco National Water Park, which was created in 1968, is a PA located between the northern region (Huetar) and central region of Costa Rica (see Figure 4.1). This PA now comprises 14,500 hectares and has an IUCN Protective Category II rating. It was designated as a freshwater protected area in 2003 in recognition of the importance of its water resources (Asamblea Legislativa 1992). This park is of high importance biologically and socially, and provides essential ecosystem services (see Figure 4.2). More than 50 rivers have their source in the park (SINAC 2012). The park's freshwater directly benefits 150 communities in 4 municipalities in terms of: potable water distributed by local water supply organizations; crop irrigation and water for cattle raising; electricity from 10 hydroelectric power plants, and tourism. The park provides an average of 996 million cubic meters of water annually; produces 17% of national electricity generation; and 12% of national milk production comes from within or around the park (Blanco Rojas 2010; SINAC 2012).

Despite considerable achievements in conservation and sustainability (Watts 2010; UNFCCC 2019; Teske et al. 2020), Costa Rica cannot afford to adequately protect all its PAs, biodiversity and natural resources (PEN 2018). PAs are a demarcated geographical area, officially declared and designated, that have natural, cultural and/or socio-economic importance, and are intended to achieve certain conservation and management

objectives (Poder Ejecutivo 2008). As a mechanism to address its lack of economic resources, when a PA is declared, rather than immediately acquire all land (as is often done elsewhere in the world), the Costa Rican government allows current landowners to remain but imposes controls on their landuse activities, with the land potentially being expropriated and compensation paid in due course. Therefore, most land within Costa Rica's PAs is privately owned. The Juan-Castro-Blanco National Water Park is a significant example of this, 92% of its area is under private ownership.

Consolidation of the park's land and protection of its freshwater resources have been the primary purpose of two not-for-profit CBOs: APANAJUCA and AFAMAAR. These organisations work independently but have similar goals, each on one side of the watershed. With members working voluntarily, both CBOs have developed socially-innovative mechanisms for green land acquisition, which we argue are interesting to document and discuss.

Community-based organizations and demands for sustainability

Protected areas are key for the conservation of tropical forests; yet it is estimated that less than 10% of the world's remaining tropical forests are within PAs (Gardner et al. 2009). PAs are easily disturbed by human actions occurring within their boundaries and also in surrounding areas. The period between 1980 and 2000 experienced a major shift in landuse in the world in which more than 80% of new agricultural land came from tropical forests rather than previously-cleared lands (Gibbs et al. 2010). Costa Rica is one of the few countries in the world that has an increase in forest cover, going from 26% in 1983 to over 52% in 2013. It also has a high percentage (over 26%) of protected land, with more than 190 PAs (González-Maya et al. 2015; Camino et al. 2016; The World Bank 2016). However, its forests and PAs are not exempt from the environmental management issues that affect tropical forests generally. Gonzalez-Maya et al. (2015) determined that, despite the amount of land set aside for PAs in Costa Rica, many species-rich areas were still not protected. Of particular concern is that there is a lack of effective environmental management in the periphery areas of PAs (Shaver et al. 2015). Duffy et al. (2001) confirmed that farmers in Costa Rica still convert land, particularly forests, for agricultural landuse. A World Bank report highlighted that Costa Rica has historically underestimated the value of its forests, and that it is crucial to adjust forest and forestry policies to effectively protect these resources and ecosystem services (The World Bank 2016). These general issues are also experienced in the Juan-Castro-Blanco National Water Park and surroundings. Being conscious of these issues led the two CBOs researched for this paper to establish their purpose and strategies.
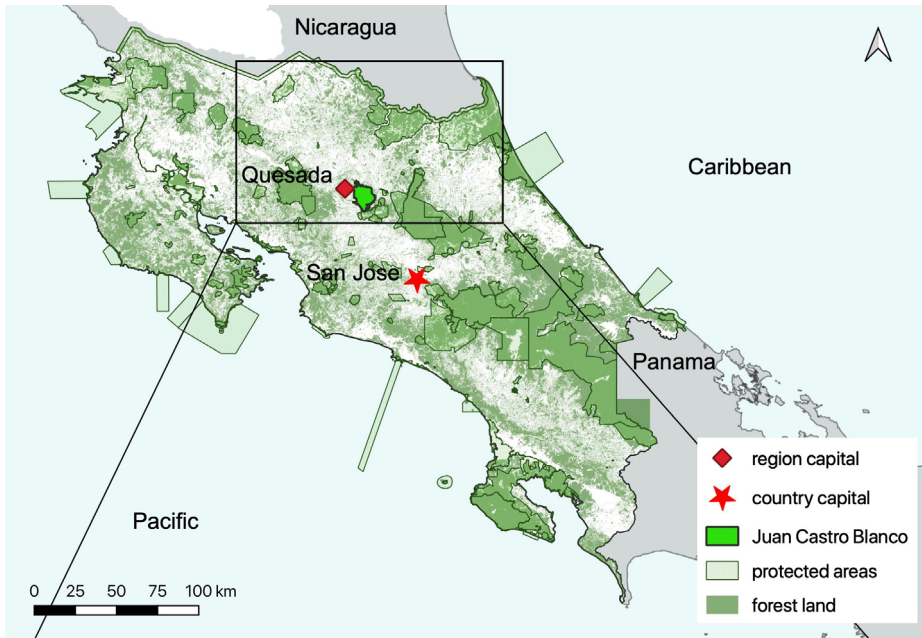
a. Protected areas and forests of Costa Rica
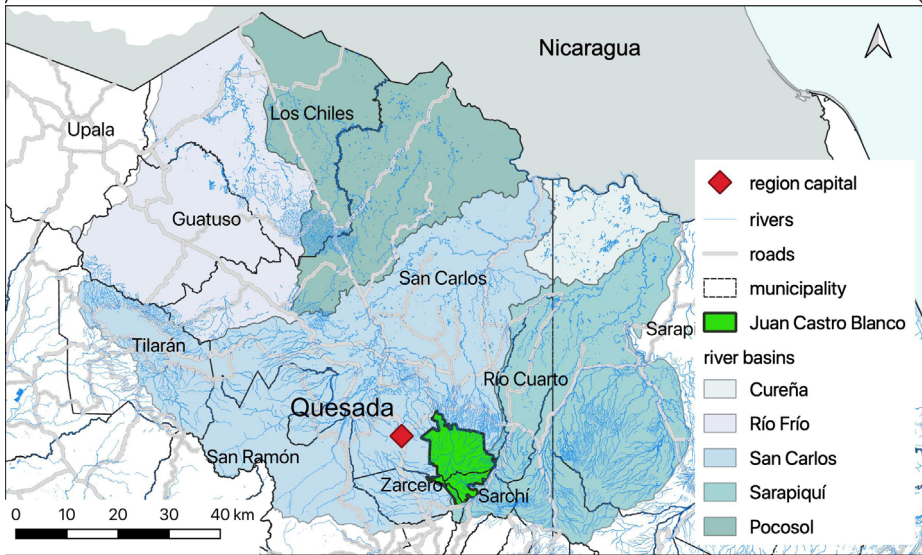
b. Hydrological importance of the Juan Castro Blanco National Water Park

Figure 4.1. Location of the Juan-Castro-Blanco National Water Park. (a) Protected areas and forest in Costa Rica, data from year 2017. (b) Hydrological importance of the park.

(Source: author based on geographical information data available at Registro Nacional, 2020 at http://www.snitcr.go.cr/)

a. La Vieja river origin   b. Pozo Verde lagoon

c. Toro III hydroelectric project   d. Dairy farmland within the Juan Castro Blanco

Figure 4.2. Some of Juan-Castro-Blanco National Water Park features. (a) La Vieja river origin. (b) Pozo Verde lagoon. (c) Toro III hydroelectric project, ICE. (d) Dairy farmland within the park's lands.

APANAJUCA, the Association for the Protection of the Juan-Castro-Blanco National Water Park

APANAJUCA was created in 1998 by citizens of the San Carlos municipality as an association dedicated to representing the park's interests and to advocating for the park's role in regional sustainable development (Castro-Arce and Vanclay 2020). The members of APANAJUCA were from communities close to the park and the nearby regional centre, Quesada. They belong to various sectors, including: dairy production, tourism, cooperatives, commerce, service, energy, public organizations, and the Catholic Church.

APANAJUCA's concern is to preserve water for future generations, and this interest is shared not only by neighbouring communities, but also by local public institutions and private companies. The interviewees claimed that there was a clear awareness in APANAJUCA and the civil society of Quesada in general of the importance of the ecosystem services the park provides, especially those related to water resources (e.g. hydroelectricity, drinking water, hot springs and other nature tourism attractions, good farming soils, and biodiversity). However, they recognised that the park has been in constant risk from public policies and private interests. For example, in 1989 the Costa Rican national government granted a sulphur mining concession inside the park, and it was only by pressure imposed by the citizens who are now part of APANAJUCA that the concession was cancelled and the protective category of the park was increased (Castro-Arce et al. 2019). There have been recent claims about illegal practices within the park, such as logging, hunting, and water extraction (Miranda 2016; Delgado 2018; Moya 2019; Delgado 2020). Another threat to the park is actions by some farmers near the park. For example, in 2019, a group of farmers publicly rebuked the park by deliberately violated the restrictions on their landuse. They also took legal action against the State claiming that, because there had been no expropriation of land (or compensation paid) since 1992 (when the park gained IUCN Category II status), the restrictions on their use of the land were unconstitutional. Although the court eventually ruled otherwise (i.e., that the restrictions were legitimate), in the interim much damage was done (Delgado 2019).

AFAMAAR, the Association Source Manager of the Aquifers of the Municipality of Alfaro Ruiz

AFAMAAR was created in 1996 by citizens of what is now the municipality of Zarcero (which was previously known as Alfaro Ruiz). Its purpose is to ensure clean water for human consumption and the availability of water for agricultural purposes. The members of AFAMAAR belong to communities located within the Juan-Castro-Blanco periphery, all being in the agriculture and dairy sector. Initially, this CBO worked under the auspices of the Municipality, but over time it decided to become independent and develop their own structure.

AFAMAAR was influenced by the Union of Costa Rican Small Agricultural Producers (UPANACIONAL), which had been alerted by health authorities in the 1990s about the high rate of gastric cancer in Zarcero. Following a review of farming practices, UPANACIONAL concluded that, most likely, the municipal water supply was being polluted by agrochemicals. According to interviewees, controls over activities in the buffer zone of water springs were lax. For springs used for human consumption, the 1972 Water Law imposed a buffer (of 100 or 200 meters depending on the context) in which all human activities were prohibited. Although this law was reinforced by the Forestry Law in 1996 which protected all water springs, there has been a lack of enforcement and thus much violation of these restrictions (Asamblea Legislativa 1972; Asamblea Legislativa 1996). Some local farmers started a campaign to raise awareness of the importance of protecting the forests and water springs from pollution. Local farmers realised early

on that what they needed to do was to promote the acquisition of significant land that protected the water and forest. This has been their mission for over 20 years. They originally worked under the auspices of the Municipality, raising funds to buy land to set aside as a public asset. Later, it was decided that the group should continue as an independent CBO. AFAMAAR's goal is to consolidate land in the periphery of the Juan-Castro-Blanco National Water Park, where most of the water springs are located, thus protecting the springs and the park.

Socially-innovative mechanisms for green land acquisition

Social-ecological systems are complex intertwined systems that encompass social (human) and ecological (nature) components that have reciprocal feedback mechanisms and an interdependent relationship (Liu et al. 2007; Ostrom 2009; Berkes et al. 2016). Protected areas are SESs (Cumming and Allen 2017). In an SES, the governance system and actors – users, mediators, or external participants – are intertwined at multiple levels and scales, with decision-making and actions having effects across scales, levels and ecosystems (Brondizio et al. 2009; Ostrom 2009; McGinnis and Ostrom 2014). Social innovation is considered to be part of the social dynamics that foster transformations in ecosystem governance and in the ecosystem itself (Biggs et al. 2010). Social innovation is as a process, a product, and an outcome, all being intrinsically connected (Polman et al. 2017; Castro-Arce and Vanclay 2020). Below, we describe the social innovation mechanisms used by APANAJUCA and AFAMAAR for green land acquisition and forest conservation.

APANAJUCA and the Coopelesca scheme

According to the members of APANAJUCA who were interviewed, in their discussions about the urgency of land consolidation for protection of the Juan-Castro-Blanco National Water Park, one thing was clear: they did not want to become land owners. They considered that their role was to be the voice of the park and to be its protector, but not a party with a direct vested interest, which they would become if they would own land. They were convinced that all farming and other productive activities that hinder forest rehabilitation and water production should be removed from within the park's boundaries. They also believed it would be easier for the formal management agency of the Huetar North region (ACAHN-SINAC) to supervise and control fewer landowners; and to eventually formally acquire all the land. After careful consideration and many brainstorming sessions with its members and the local community, APANAJUCA designed a social innovation mechanism by which third parties could acquire land within the park for conservation and the collective public good.

The Coopelesca scheme (see also Castro-Arce et al. 2019) is a mechanism by which APANAJUCA finds and negotiates with interested third parties (usually not-for-profit

organisations) that will acquire land within the park, place a covenant on the land and/or put it into a land trust for rehabilitation, conservation and environmental research. APANAJUCA's role is to select appropriate land, negotiate a price with the current owner, find interested partners to acquire the land, manage the trust fund, manage the land, and act as a bridging institution (between public and private) in the governance of the PA. The partner needs to be an organization with environmental and public interest objectives, for example: cooperatives, foundations, water associations, and community development associations. These organisations tend to work in the public interest and therefore they receive support from the State.

The first partnership APANAJUCA developed was with the Rural Electrification Cooperative of San Carlos (Coopelesca). Together, the two organisations created a green savings trust, in which the associates of the cooperative – its 60,000 electricity consumers – since 2010 donate a small amount of their electricity bill to a fund. In 2014, the fund purchased over 1,200 hectares of land in the park, about 8.5% of its total area. The benefits to Coopelesca include Carbon Neutral Certification and assurance of ongoing water supply for their hydroelectric power plants, which are located in the periphery of the park. Currently, APANAJUCA is looking for more land to acquire and place in Coopelesca's trust fund. It is also negotiating with other local cooperatives to establish similar schemes. This green land acquisition mechanism developed by APANAJUCA can be considered to be socially innovative in that it was conceived and enacted by a CBO with a genuine concern about sustainability. These mechanisms were developed through the creation of relations and instruments that were not in place before.

AFAMAAR and the Nectandra scheme

According to our interviewees, members of AFAMAAR and other local people not in the organisation, the quality of water, the amount of water, and public health issues were the key elements of the discourse used by AFAMAAR to convince the community of Zarcero to contribute money for land acquisition. AFAMAAR started their campaign by organising local events, e.g. at which they would receive cattle or product donations to be auctioned later, or being beneficiaries of the Catholic Church's annual parish fair. The profits of these activities were put in a fund in the name of the association. Unlike APANAJUCA, AFAMAAR is agreeable to being the owner of land, as most land they acquire is not within the park boundaries. With the money raised, they were able to buy several properties, totalling over 500 hectares. However, despite the good intentions of the community, raising money in this way was slow. In 2007, AFAMAAR members became acquainted with the Nectandra Institute, which offered them a green loan to purchase a property.

The Nectandra Institute, which was founded in 1999, is a NGO registered in California (USA) and is dedicated to the conservation of the Costa Rican cloud forest and to the stewardship of watershed ecosystems (Nectandra Institute 2020). It is a registered Section 501(3)(c) organisation so that it is tax exempt and donations from US citizens are tax-deductible. The institute has a sister organisation in Costa Rica, Nectandra S.A., which manages the Nectandra Cloud Forest Garden, a 150-hectare property in the River

Balsa sub-basin in the Municipality of San Ramon. In words of the interviewees, the garden was like an island rich in biodiversity, but surrounded by dairy pastures and ornamental plant farms. A watershed ecosystem vision was needed, and the institute started to promote the idea of green land acquisition to create biodiversity corridors. Coincidentally, many of the lands in question were water spring areas that also needed protection. Nectandra staff met with representatives of local water and sewage utilities (ASADAs) who, given that they lacked financial resources, urged that the properties that should be bought were those in which their water sources were located. The managers of the Nectandra Institute, in Costa Rica, designed a green loan mechanism, which they called an eco-loan fund. The eco-loan fund charges 0% interest, and has a 10 to 15-year term of repayment. Instead of charging interest in monetary terms, they expect the borrower to undertake socio-ecological actions in the form of environmental workshops, educational programs in schools (especially in rural communities), and/or provide adequate ecological maintenance of the properties by restoring, protecting and monitoring the ecosystem services.

The interviewees, from Nectantra Institute and AFAMAAR, claimed that the mechanism is based on trust, and that there is a symbiotic relationship between the parties. Interested borrowers submit a loan proposal that includes an environmental management plan of the property, the financial history of the applicant organisation, and a repayment plan. Successful organisations not only receive the requested funding, but also technical assistance and coaching in green business. Their common interest is protection of ecosystems and ecosystem services. As at the date of the interviews (June, 2019), there had never been a late repayment because of the shared understanding of the importance of making funds available to other applicants. As at 2019, 9 projects had been funded by Nectandra eco-loans in Costa Rica. The first eco-loan was given in 2007 for a property of 11 hectares, and by 2019 over 200 hectares had been acquired. AFAMAAR's eco-loan was implemented in 2009 to purchase the 100-hectare Ocotea farm. This was regarded as a major achievement by Nectandra and AFAMAAR's members (see Figure 4.3).

The Nectandra scheme is an interesting, socially-innovative financing mechanism, and a good example of how a social innovation fostered social-ecological transformation. Following Nectandra's example, AFAMAAR is now financing green land acquisitions using their version of the eco-loan fund mechanism. AFAMAAR's capital is now being generated by three means: (a) some of their properties receive payment for ecosystem services (PES) from the State; (b) some properties have been re-sold (with the covenant affixed) to other organisations or to the Municipality of Zarcero; and (c) earnings are put into profitable trusts or investment plans. AFAMAAR had already financed two organisations, and are in the process of co-financing a third one in conjunction with the Nectandra Institute. In total, AFAMAAR now owns over 700 hectares and has aided in the acquisition of another 50 hectares via the Nectandra scheme. The interviewees recognise that AFAMAAR's aspirations have evolved, moving from ensuring water for agriculture and clean drinking water to a more integrated view of quality of life that includes biodiversity conservation and carbon reduction. Their current goal is to consolidate land in the park fringe in which their properties are located and, in that way, ensure both conservation of the water springs and the Juan-Castro-Blanco National Water Park.

Figure 4.3. Aerial view of Ocotea farm.

(Source: Manrique Esquivel, Nectandra Institute, https://es.slideshare.net/gwpcam/manrique-esquivel-instituto-nectandra-costa-rica)

Challenges for protected area governance and environmental governance

The future of tropical forests, PAs, and their ecosystems services depends more than ever on: (a) more effective community involvement (Borrini-Feyerabend and Hill 2015); (b) harnessing of the synergies between environmental and social objectives (Sarkki et al. 2015; Heslinga et al. 2020); (c) creative partnerships between public and private sectors (Pringle 2017); and (d) effective management of human-modified landscapes (Gardner et al. 2009). These environmental governance strategies were all present in the governance of the Juan-Castro-Blanco National Water Park. The trigger for social innovation was the need for water provision (quality and quantity) for the communities surrounding the PA. This social need was aligned with the environmental objectives of nature conservation. Because nature conservation is not of exclusive interest only to States, public agencies (municipalities and management agencies), private sector organisations and community organisations agreed to develop relationships that will foster accomplishment of the

social-ecological objectives. The mechanisms developed in these new relationships are intended to safeguard water sources and biodiversity by consolidating forest land. The more the communities self-organise and take responsibility for governance functions, the more likely it is that the forests will be protected (Andersson et al. 2014). However, this environmental governance process presents important challenges to conservation and landuse management; it will require a conscious effort from all actors, because the goals are hard to accomplish (Gardner et al. 2009; Sarkki et al. 2015).

In researching the Juan-Castro-Blanco National Water Park and the two socially-innovative organisations that act to protect it, APANAJUCA and AFAMAAR, we identified some governance challenges that it faced and that PA management elsewhere may also encounter:

1. The balance between productive and conservation land. In the context of Juan-Castro-Blanco, all forest land comprises high quality soil desirable for crops and farming. The social-ecological characteristics of the system demand a balance between these land uses.

2. Increased land prices. With agriculture and dairy farming being high profitable, and with payments for ecosystem services potentially also being profitable, the price of land increases over time. This makes it complex. It is expensive for farmers to expand operations, as well as for the CBOs to purchase land at commercial rates. It also makes it complicated for the State to expropriate the land at fair compensation levels.

3. Diverse interests and goals. The more actors, the more interests there are to satisfy. Every actor in the governance of the Juan-Castro-Blanco not only plays a role, but also demands their needs to be met. It is not always easy to describe the roles and prioritize the interests in the governance dynamics. This means that there may be frictions between parties, for example jealousy about hierarchies, tasks or accomplishments, leading to resentment and jeopardizing the ultimate goal of protected area and forest conservation.

4. Getting consensus on a common sustainability framework. Each sector and actor involved in the environmental governance has their own definitions on sustainability, conservation and resource use; which are based on their own epistemology and cosmology. For effective forest and PA governance, consensus is needed, otherwise there will be mistrust in the actions of the actors, and it will be difficult to develop alliances to foster social innovation.

5. Outdated formal regulations and planning systems. New management and ownership models that result from the social innovation processes, and that are developed for more adaptive environmental governance are not usually included in existing legal structures. Until the public system assimilates the new forms of organizing, it might be problematic to reconcile the new practices with old legal frameworks, thus jeopardizing the effectiveness of the results.

Applying a social innovation lens to green land acquisition

The green grabbing literature primarily critiques those conservation organizations that prioritize the environment over local communities (Corson et al. 2013; Kopnina 2015; Vanclay 2017a; Busscher et al. 2018). Even, when there is community involvement or community-based natural resource management, scholars of land grabbing often remain suspicious (Benjaminsen and Bryceson 2012), especially because relying on local communities does not necessarily guarantee the conservation of forests and protected areas (Kopnina 2015); and because local actors may participate simply to gain personal benefit (Green and Adams 2015). The development of new governance relationships is sometimes considered to be problematic because of the potential social harm that can be created (Vanclay 2017a). Therefore, new socially innovative arrangements are needed, for example the ones forged around the governance of the Juan-Castro-Blanco National Water Park, which resulted in the acquisition of land for conversion of agriculture back into forest.

We argue that more research is needed to unravel the nuances of green grabbing. Some nuances have been mentioned in literature, for example: Franco & Borras (2019) recognize that the interconnections between environmental discourses, actors and aims – across global and local levels – are not unambiguous, requiring more analysis to understand the governance processes; Corson et al. (2013) concede that more examination of the governance system and the logics that trigger and promote green land acquisition is needed; and, Fairhead et al. (2012) advocate that the aims and processes by which land is acquired, and the resultant outcomes, are intrinsically dependent on the context.

With our research, we showed that using a social innovation lens enables delving deeper into the governance of an SES and the social-ecological motives that promote green land acquisition. Zooming in to local and small-scale green land acquisition facilitates understanding the interconnections between actors, expectations, and most importantly, the benefits and beneficiaries of social innovation. Any social innovation seeks the improvement of society, addresses social-ecological needs of communities, and empowers people (Mehmood and Parra 2013). Using a social innovation lens to examine APANAJUCA and AFAMAAR, and their green land acquisition mechanisms, revealed aspects of green land acquisition (notably their potential positive benefits) that have not been previously considered. It provided an opportunity to consider different aspects of green grabbing; allowing consideration of green land acquisition as potentially being positive in its aims and outcomes.

Conclusion

In this paper, we considered an interesting and unusual aspect that is under-researched in the literature on land acquisition, land grabbing and green grabbing: that not all green land acquisition is done by powerful outsiders and necessarily leads to dispossession. We focused on small-scale, community-led land acquisition for conservation purpose. We used the social-ecological systems and social innovation literature to consider the positive aims, methods and outcomes from green land acquisition undertaken by two local organisations, APANAJUCA and AFAMAAR, to support the Juan-Castro-Blanco National Water Park in Costa Rica. These two local organisations were interested in land consolidation for the conservation of the park and its forests and water resources. Using a social innovation lens, we examined the aims, motivations, actors, mechanisms, and expected outcomes from their green land acquisition activities. We consider that APANAJUCA and AFAMAAR, and their green land acquisition mechanisms, were good examples of social innovation. Their practices displayed the processes, products and outcomes of social innovation, and how social innovation impacts positively on local environmental governance and regional sustainable development. Our analysis showed that the relations forged and mechanisms used to protect the park and the forest created new models of environmental governance adding to the suite of potential tools and strategies to be used in protected area management. However, despite the success of the community-based organisations we considered, they still faced some challenges including: the balance between productive and conservation land; increasing land prices; diverse interests and goals; getting consensus on a common sustainability framework; and outdated formal regulations and planning systems. Our findings revealed that conservation can have many motives, but when synergies are developed, social innovation is likely to emerge.

We consider this paper to be a starting point in the exploration of the basis of community involvement in green land acquisition, and in the development of social innovation in the context of community-based natural resource management in a developing country. We encourage further research that would allow a comparison of results from different geographical and cultural settings. We suggest a focus on the changes in the governance of protected areas and forests prompted by social innovation, and the ways rules are created and enacted.

References

Andersson, K., Benavides, J.P. and León, R. 2014. Institutional diversity and local forest governance. *Environmental Science & Policy* 36, pp. 61–72.

Asamblea Legislativa 1972. *Ley de aguas - y modificaciones*. Costa Rica: SINALEVI.

Asamblea Legislativa *Ley de Creación del Parque Nacional del Agua, Juan Castro Blanco.* Costa Rica: La Gaceta 110, date 09/06/1992.

Asamblea Legislativa *Ley Forestal y modificaciones*. Costa Rica: La Gaceta 172, date 16/04/1996.

Benjaminsen, T.A. and Bryceson, I. 2012. Conservation, green/blue grabbing and accumulation by dispossession in Tanzania. *Journal of Peasant Studies* 39(2), pp. 335–355.

Berkes, F. et al. 2016. *Analysis of social-ecological systems for community conservation.* Halifax, Canada.

Biggs, R., Westley, F. and Carpenter, S. 2010. Navigating the back loop: Fostering social innovation and transformation in ecosystem management. *Ecology and society* 15(2), art9.

Blanco Rojas, H. 2010. Áreas de recarga hídrica de la parte media-alta de las microcuencas Palo, Marín y San Rafaelito, San Carlos, Costa Rica. *UNED Research Journal* 2(2), pp. 181–204.

Borras, S.M., Franco, J.C., Gómez, S., Kay, C. and Spoor, M. 2012. Land grabbing in Latin America and the Caribbean. *The Journal of Peasant Studies* 39(3–4), pp. 845–872.

Borrini-Feyerabend, G. and Hill, R. 2015. Governance for the conservation of nature. In: Graeme L. Worboys, Michael Lockwood, Ashish Kothari, Sue Feary, and Ian Pulsford eds. *Protected Area Governance and Management*. Canberra: ANU Press, pp. 169–206.

Brondizio, E.S., Ostrom, E. and Young, O.R. 2009. Connectivity and the governance of multilevel social-ecological systems: The role of social capital. *Annual Review of Environment and Resources* 34(1), pp. 253–278.

Busscher, N., Parra, C. and Vanclay, F. 2018. Land grabbing within a protected area: The experience of local communities with conservation and forestry activities in Los Esteros del Iberá, Argentina. *Land Use Policy* 78, pp. 572–582.

Busscher, N., Parra, C. and Vanclay, F. 2019a. Environmental justice implications of land grabbing for industrial agriculture and forestry in Argentina. *Journal of Environmental Planning and Management*, pp. 1–23.

Busscher, N., Vanclay, F. and Parra, C. 2019b. Reflections on how state–civil society collaborations play out in the context of land grabbing in Argentina. *Land* 8(8), p. 116.

Camino, R. de, Villalobos, R., Pierre, J. and Aymerich, M. 2016. Costa Rica case study prepared for FAO as part of the State of the world's forests 2016 (SOFO). Available at: http://www.fao.org/3/a-C0180e.pdf

Castree, N. 2011. Neoliberalism and the biophysical environment: A synthesis and evaluation of the research. *Environment and Society* 1(1), pp. 5–45.

Castro-Arce, K., Parra, C. and Vanclay, F. 2019. Social innovation, sustainability and the governance of protected areas: Revealing theory as it plays out in practice in Costa Rica. *Journal of Environmental Planning and Management*, 62(13), pp. 2255–2272.

Castro-Arce, K. and Vanclay, F. 2020. Transformative social innovation for sustainable rural development: An analytical framework to assist community-based initiatives. *Journal of Rural Studies* 74, pp. 45–54.

Corson, C., MacDonald, K.I. and Neimark, B. 2013. Grabbing green: Markets, environmental governance and the materialization of natural capital. *Human Geography* 6(1), pp. 1–15.

Cumming, G.S. and Allen, C.R. 2017. Protected areas as social-ecological systems: Perspectives from resilience and social-ecological systems theory. *Ecological Applications* 27(6), pp. 1709–1717.

Dao, N. 2015. Rubber plantations in the Northwest: Rethinking the concept of land grabs in Vietnam. *Journal of Peasant Studies* 42(2), pp. 347–369.

Delgado, M. 2018. *Proyecto eólico se desarrollaría en San Vicente y Parque Nacional del Agua Juan Castro Blanco*. Available at: https://sancarlosdigital.com/proyecto-eolico-se-desarrollaria-en-san-vicente-y-parque-nacional-del-agua-juan-castro-blanco/

Delgado, M. 2019. *Sala Constitucional ratifica: PNJCB es de los sancarleños*. Available at: https://sancarlosdigital.com/sala-constitucional-ratifica-pnjcb-es-de-los-sancarlenos/

Delgado, M. 2020. *¡Lamentable! Tala ilegal socava Parque Nacional del Agua Juan Castro Blanco*. Available at: https://sancarlosdigital.com/lamentable-tala-ilegal-socava-parque-nacional-del-agua-juan-castro-blanco/

Diepenmaat, H., Kemp, R. and Velter, M. 2020. Why sustainable development requires societal innovation and cannot be achieved without this. *Sustainability* 12(3), p. 1270.

Duffy, S.B., Corson, M.S. and Grant, W.E. 2001. Simulating land-use decisions in the La Amistad Biosphere Reserve buffer zone in Costa Rica and Panama. *Ecological Modelling* 140(1–2), pp. 9–29.

Evans, R. 2011. Case study method in sustainability research. In: Franklin, A. and Blyton, P. eds. *Researching sustainability. A guide to social science, methods, practice and engagement*. Oxon, New York: Earthscan, pp. 54–70.

Fairhead, J., Leach, M. and Scoones, I. 2012. Green grabbing: A new appropriation of nature? *Journal of Peasant Studies* 39(2), pp. 237–261.

Franco, J.C. and Borras, S.M. 2019. Grey areas in green grabbing: subtle and indirect interconnections between climate change politics and land grabs and their implications for research. *Land Use Policy* 84(March), pp. 192–199.

Gardner, T.A., Barlow, J., Chazdon, R., Ewers, R.M., Harvey, C.A., Peres, C.A. and Sodhi, N.S. 2009. Prospects for tropical forest biodiversity in a human-modified world. *Ecology Letters* 12(6), pp. 561–582.

George, G., Baker, T., Tracey, P., Joshi, H. and Peredo, A.M. 2019. Indigenous social innovation: What is distinctive? And a research agenda. *Handbook of Inclusive Innovation* (1), pp. 107–128.

Gibbs, H.K., Ruesch, A.S., Achard, F., Clayton, M.K., Holmgren, P., Ramankutty, N. and Foley, J.A. 2010. Tropical forests were the primary sources of new agricultural land in the 1980s and 1990s. *Proceedings of the National Academy of Sciences of the United States of America* 107(38), pp. 16732–16737.

González-Maya, J.F., Víquez-R, L.R., Belant, J.L. and Ceballos, G. 2015. Effectiveness of protected areas for representing species and populations of terrestrial mammals in Costa Rica. Jenkins, C. N. ed. *PLOS ONE* 10(5), p. e0124480.

Green, K.E. and Adams, W.M. 2015. Green grabbing and the dynamics of local-level engagement with neoliberalization in Tanzania's wildlife management areas. *The Journal of Peasant Studies* 42(1), pp. 97–117.

Heslinga, Groote and Vanclay 2020. Towards resilient regions: Policy recommendations for stimulating synergy between tourism and landscape. *Land* 9(2), p. 44.

Holmes, G. 2014. What is a land grab? Exploring green grabs, conservation, and private protected areas in southern Chile. *Journal of Peasant Studies* 41(4), pp. 547–567.

Kluvánková, T. et al. 2018. Understanding social innovation for the well-being of forest-dependent communities: A preliminary theoretical framework. *Forest Policy and Economics* 97(September), pp. 163–174.

Kopnina, H. 2015. Revisiting the Lorax complex: Deep ecology and biophilia in cross-cultural perspective. *Environmental Sociology*, pp. 1–10.

Liu, J. et al. 2007. Complexity of coupled human and natural systems. *Science* 317(5844), pp. 1513–6.

McGinnis, M.D. and Ostrom, E. 2014. Social-ecological system framework: Initial changes and continuing challenges. *Ecology and Society* 19(2), p. 30.

Mehmood, A. and Parra, C. 2013. Social innovation in an unsustainable world. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 53–66.

Melnykovych, M., Nijnik, M., Soloviy, I., Nijnik, A., Sarkki, S. and Bihun, Y. 2018. Social-ecological innovation in remote mountain areas: Adaptive responses of forest-dependent communities to the challenges of a changing world. *Science of the Total Environment* 613–614(February), pp. 894–906.

Miranda, H. 2016. *Depredadores están "vaciando" de especies los bosques protegidos*. Available at: http://semanariouniversidad.ucr.cr/pais/depredadores-estan-vaciando-especies-los-bosques-protegidos/

Moore, M.L. and Westley, F. 2011. Surmountable chasms: Networks and social innovation for resilient systems. *Ecology and Society* 16(1), art5.

Moulaert, F., MacCallum, D. and Hillier, J. 2013. Social innovation: Intuition, precept, concept, theory and practice. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 13–24.

Moya, G. 2019. *Proyecto para tomar agua del parque Juan Castro Blanco es legal, insisten dirigentes de acueducto*. Available at: https://www.teletica.com/240636_proyecto-para-tomar-agua-del-parque-juan-castro-blanco-es-legal-insisten-dirigentes-de-acueducto

Nectandra Institute [no date]. *About Us - Organization & Mission*. Available at: https://www.nectandra.org/org/about.php

Nijnik, M., Secco, L., Miller, D. and Melnykovych, M. 2019. Can social innovation make a difference to forest-dependent communities? *Forest Policy and Economics* 100(December 2018), pp. 207–213.

Ostrom, E. 2009. A general framework for analyzing sustainability of social-ecological systems. *Science* 325(5939), pp. 419–422.

Pasaribu, S.I., Vanclay, F. and Zhao, Y. 2020. Challenges to implementing socially-sustainable community development in oil palm and forestry operations in Indonesia. *Land* 9(3), p. 61.

PEN 2018. *Estado de la Nación en desarrollo humano sostenible*. San José, C.R. http://repositorio.conare.ac.cr/handle/20.500.12337/2983

Poder Ejecutivo 2008 *Reglamento a la Ley de Biodiversidad*. Costa Rica: La Gaceta 68, 08-04-2008.

Polman, N. et al. 2017. *Report D2.1 Transdisciplinary understanding of SI in MRAs*. (Project number 677622) Social Innovation in Marginalised Rural Areas (SIMRA), European Commission.

Pringle, R.M. 2017. Upgrading protected areas to conserve wild biodiversity. *Nature* 546(7656), pp. 91–99.

Ravazzoli, E. and Valero, D.E. 2020. social innovation: An instrument to achieve the sustainable development of communities. In: Leal Filho, W., Azul, A. M., Brandli, L., Özuyar, P. G., and Wall, T. eds. *Sustainable Cities and Communities*. Cham: Springer International Publishing, pp. 1–10.

Sarkki, S., Parpan, T., Melnykovych, M., Zahvoyska, L., Derbal, J., Voloshyna, N. and Nijnik, M. 2019. Beyond participation! Social innovations facilitating movement from authoritative state to participatory forest governance in Ukraine. *Landscape Ecology* 34(7), pp. 1601–1618.

Sarkki, S., Rantala, L. and Karjalainen, T.P. 2015. Local people and protected areas: Identifying problems, potential solutions and further research questions. *International Journal of Environment and Sustainable Development* 14(3), p. 299.

Shaver, I. et al. 2015. Coupled social and ecological outcomes of agricultural intensification in Costa Rica and the future of biodiversity conservation in tropical agricultural regions. *Global Environmental Change* 32, pp. 74–86.

Sikor, T. 2012. Tree plantations, politics of possession and the absence of land grabs in Vietnam. *Journal of Peasant Studies* 39(3–4), pp. 1077–1101.

SINAC 2012. *Plan general de manejo del Parque Nacional del Agua Juan Castro Blanco*. San Carlos, Costa Rica.

Teske, S., Morris, T. and Nagrath, K. 2020. *100% Renewable energy for Costa Rica*. USA. Available at: www.isf.uts.edu.au

The World Bank 2016. Accounting reveals that Costa Rica's forest wealth is greater than expected. *The World Bank website*, pp. 2–5. Available at: http://www. worldbank.org/en/news/feature/2016/05/31/accounting-reveals-that-costa-ricas-forest-wealth-is-greater-than-expected

UNFCCC 2019. *Costa Rica named 'UN Champion of the Earth' for pioneering role in fighting climate change*. Available at: https://unfccc.int/news/costa-rica-named-un-champion-of-the-earth-for-pioneering-role-in-fighting-climate-change

Vanclay, F. 2017a. Principles to gain a social licence to operate for green initiatives and biodiversity projects. *Current Opinion in Environmental Sustainability* 29, pp. 48–56.

Vanclay, F. 2017b. Project-induced displacement and resettlement: From impoverishment risks to an opportunity for development? *Impact Assessment and Project Appraisal* 35(1), pp. 3–21.

Vanclay, F., Baines, J.T. and Taylor, C.N. 2013. Principles for ethical research involving humans: Ethical professional practice in impact assessment Part I. *Impact Assessment and Project Appraisal* 31(4), pp. 243–253.

Vanclay and Hanna 2019. Conceptualizing company response to community protest: Principles to achieve a social license to operate. *Land* 8(6), pp. 1–34.

Watts, J. 2010. *Costa Rica recognised for biodiversity protection*. Available at: https://www.theguardian.com/environment/2010/oct/25/costa-rica-biodiversity

Xu, Y. 2018. Land grabbing by villagers? Insights from intimate land grabbing in the rise of industrial tree plantation sector in Guangxi, China. *Geoforum* 96(November 2017), pp. 141–149.

Yin, R.K. 2009. *Case study research: Design and methods*. London: Sage Publications. Zoomers, A. 2010. Globalisation and the foreignization of space: Seven processes driving the current global land grab. *Journal of Peasant Studies* 37(2), pp. 429–447.

ADVANCING ADAPTIVE PLANNING THROUGH MAINSTREAMING SOCIAL INNOVATION

Abstract

We argue that social innovation in and for social-ecologically sustainable regional development is an informal planning practice that should be recognised in the planning system. We discuss how social innovation promotes more adaptive governance and flexible planning practice. As an important dynamic that not only influences but also fosters regional transformation, there is much interest from policy makers and academics about the spread and replication of social innovation. Through a comparative case study, we analysed four social innovation initiatives in Costa Rica, one of which was the original 'seed' or parent. We consider what elements and processes they have in common? Was the replication successful in terms of survival of the initiative, accomplishment of goals, and social-ecological transformative potential? Our analysis showed that social innovation is not a formula that can be replicated indiscriminately without considering local social-ecological characteristics. There is no one-size-fits-all. Nevertheless, our research provides evidence that socially innovative initiatives can be replicated, but arguably there is less transformative potential of its offspring. We conclude by offering some general reflexions on the uniqueness of social innovation as territorial expressions; hence, informal planning practices that are intrinsic to each planning system.

Keywords: social innovation; social-ecological systems; community initiatives; community resilience; adaptive planning; adaptive governance.

Advancing adaptive planning through mainstreaming social innovation and rolling out local initiatives

Introduction

Challenges and crises can arise everywhere around the world. More than ever, multiscale and multilevel social-ecological dynamics demonstrate the interconnectedness of people and nature, and of places and societies. Given this context, social innovation has gained attention in policy, science and in the public eye because of its transformative capacity (Howaldt et al. 2018). It has been presented as a panacea to answering local struggles (European Commission 2013). Moreover, it has often been urged that successful cases of social innovation should be replicated across regions (Mulgan 2007). Nevertheless, a caveat: social innovation is often a territorial expression that emerges from the needs and disruptions that affect the bonds between humans and nature (van Dyck and van den Broeck 2013; Moulaert and van den Broeck 2018; Castro-Arce et al. 2019).

Because social innovation is inherently informal (Godin 2012), encouraging the replication of social innovation initiatives, especially those dealing with social-ecological needs, is, in effect, to encourage informal practices that have an effect in the planning system, thus adding to the complexity of planning. Understanding the diversity of informal planning practices is important because, as Briassoulis (1997) stated, if informal planning is ignored then "formal plans will address a misspecified model of reality, thus risking ineffectiveness" of these plans (1997, p.106).

In this paper, we explore four cases of social innovation initiatives in various regions of Costa Rica that were triggered by similar social-economic needs in each region. One of these cases is what we call the 'parent initiative', because it sprouted a growing number of similar initiatives and it encouraged them to replicate its actions. We do not intend to evaluate the social-ecological impact of each initiative, rather we discuss whether it was appropriate to seek to reproduce the aims, structures, and processes of the 'original' social innovation initiative. From our fieldwork data, and by using the literature on adaptive social-ecological systems (SES) (Folke et al. 2005; Olsson et al. 2006; Chaffin and Gunderson 2016), we seek to improve understanding of social innovation as an informal planning practice, and about the ways social innovation promotes a more flexible planning system.

Entangling adaptive planning practices and social innovation

Adaptive regions

The connectivity of regions, the intricacy of interactions between all things (environmental, social, cultural, or economic), along with the rapidity of reactions and responses, comprise a 'landscape of complexity' (Cooke-Davies et al. 2007), in which institutions have been forced to reorganize or reshape to find new identities and functions (Andonova and Mitchell 2010; Chaffin and Gunderson 2016; Folke 2019). The social-ecological challenges that result from this dynamic system have repercussions across all scales and political levels. Typically, in an unpredictable fashion, some of those repercussions are changing the spatial patterns and social relations to which the planning system needs to adapt. As Folke (2019) insisted: "there is no local action taking place in isolation, but it is embedded and strongly influenced by emergent patterns as well as properties at broader scales"(Folke 2019, p.25).

Regions are the spaces where the playing-out of geographical scale and level of governance become expressed; resulting in converging challenges, needs, and of all the creative ways societal groups deal with them. Furthermore, regions are intertwined systems of people and nature, i.e. they are social ecological systems. A highly connected world also becomes manifested in a highly connected territory – one in which any decision made in any sphere of activity directly and/or indirectly affects the other spheres and the environment. The same is true in reverse: disruptions in the environment (e.g., various forms of disaster) can greatly impact societal development (Imperiale and Vanclay 2016; Imperiale and Vanclay 2021). Considering regions as social-ecological systems (Castro-Arce and Vanclay 2020b) allows exploring the ways societies (and especially their planning systems) respond to non-linear interactions, which may provoke unintended, autonomous, self-organised, and/or intuitive reactions. As de Roo et al. (2020) mentioned, regions are products of the processes of emergence and self-organization as well as of systematic and planned interventions.

Regions are spatially, socially, culturally, ecologically heterogeneous; and are built up over time via cross-scale interactions. When disruptions occur – i.e., political shifts, nature or human related disasters, economic crises, cultural conflicts, among other internal or external stresses –it is difficult for the SES and the planning system that is embedded within it to follow the planned trajectory (Folke 2006). The development of regions is a continuous process that is enriched by their heterogeneity, by disruptions, and by the ways society and nature respond to these disruptions. Self-organized responses are ways for a region to cope with disturbances. Such responses improve the adaptive capacity of a region, especially given the uncertainty and risk which is constantly present (Berkes et al. 2003; Folke 2019; de Roo et al. 2020). All these forces, dynamics and interactions create space for (social) innovation and opportunities for change (Moulaert 2009; Biggs et al. 2010; Olsson and Galaz 2012; Westley et al. 2013; Avelino et al. 2017).

Social innovation as a spatial process

It is clear that social innovation can play a role in fostering socio-spatial transformations that contribute to sustainability (Biggs et al. 2010; Olsson et al. 2017; Castro-Arce et al. 2019; Loorbach et al. 2020; Novikova 2021; Rivera-Arriaga et al. 2021). Social innovation is born out of unsatisfied social and/or ecological needs, and from social-ecological disturbances. Social innovation implies creation, changes, or transformation in social relations, governance processes, and political arrangements in the attainment, not only of the satisfaction of those needs, but also for the improvement of the social system when adapting to such disturbances (Castro-Arce et al. 2019; Castro-Arce and Vanclay 2020b). Therefore, social innovation reflects on particular actions, as well as, on social mobilisation and participation processes, and on the outcomes of those actions (Moulaert et al. 2013). Following this thinking, social innovation is not a tangible outcome in itself, but it can have tangible outcomes expressed in regional improvement (Neumeier 2012).

Social innovation can be manifested as informal planning practice, especially when the triggering mechanisms (Castro-Arce and Vanclay 2020b) are failures in the governance and/or planning systems, or needs in spatialized social-ecological relations (Moulaert and van den Broeck 2018). Moreover, the spatial context is not only the 'place' where social innovation occurs, but is the 'place' that is transformed by new or renewed relations that are spatially negotiated and spatially embedded (van Dyck and van den Broeck 2013). Therefore, social innovation can also be manifested as informal planning practice when the outcomes of social innovation, do in fact, change the planned or current – social-ecological – trajectory of the region. For this understanding, there is a need to acknowledge the space in which a SES, i.e. a region, develops as a unique space: as a product of particular interrelations and interactions over time; consisting of heterogeneous and multiple cultures, environments, and institutions; and unfinished, open and under-construction (Massey 2005).

Because the space where social innovation develops is unique, also unique is the way the SES will respond to the innovation. Social innovation is embedded in the SES, a system that consequently is affected by the action and outcomes of social innovation. When social innovation acts upon the triggering mechanisms, not only satisfy the needs, but also change the context in which the original disturbances arise, creating new opportunities, and spaces for new disturbances to occur. Social innovation is an iterative process (Castro-Arce et al. 2019). Meaning that social innovation can be an adaptive response to the disturbances, a process that enhances the adaptive capacity of the SES, and a renewed space. Social innovation is a unique spatial expression.

Social innovation as informal planning practice

When referring to informal planning practices, traditionally scholarship has reflected primarily on urban issues, particularly housing and land management dynamics (Hillier 2000; Kombe and Kreibich 2000; Miraftab 2009; McFarlane 2012; Tsenkova 2012; Randolph 2017; Harris 2018). More recently, the concept of informal planning practice

has been used in the analysis of social-ecological issues, e.g. urban gardening (Certomà and Notteboom 2017; Certomà et al. 2020), ecosystem-based adaptation (Schneider et al. 2021), and rural development (Meijer and Syssner 2017; Syssner and Meijer 2017). Yet, the concept has not been brought into the social innovation discourse. We do not intend to dwell on the dichotomy of formal versus informal planning (McFarlane 2012; van Assche et al. 2014), but to highlight another way that structures the planning system, i.e., social innovation.

We consider that formal planning practices are structured by a set of rules, regulations, or laws, and enacted by the governments and their agencies, or by public/private institutions that have the mandate to do so, being constituted for planning purposes (Healey 2006; van Assche et al. 2014). Conversely, we considered informal planning practices to be those developing outside or intertwined with this framework, revolving around social relations and networks, agreements, transactions, and trust (Healey 2006; van Assche et al. 2014). Yet, in planning systems, both formal and informal practices apply, it is not necessarily one versus the other, as Patsy Healey (2006) stated, there is a "complexly intertwined social reality in which integrations and boundaries, cohesions and exclusions cannot be read off from simple "maps" of organizational structures" (2006, p.303).

As recognized by many writers (Briassoulis 1997; Meijer and Syssner 2017; Schneider et al. 2021), informal planning practices can shape the formal planning practices, while shaping the territory in their quest for improving their local/urban/regional circumstances. Informal planning practices are "driven by systematic processes that, despite responding to a different logic, possess the characteristics of planning … In fact, observed end states often result from the interaction of formal and informal planning" (Briassoulis 1997, p.106). Social innovation that seeks to attend to social-ecological needs that haven't been met, especially by public institutions, may be performing informal planning practices. In informal planning practices, ideally the actors choose to come together and align with each other's intentions in order to satisfy their needs and future goals by devising means, or adapting existing ones (Briassoulis, 1997). Moreover, as several investigations have noted (Olsson et al. 2006; Certomà and Notteboom 2017; Meijer and Syssner 2017; Certomà et al. 2020), some informal planning practices not only reshape the spatiality of the territory, but can also provoke new or renewed ways of governance, in which non-traditional actors are empowered. Informal planning practices encourage a more flexible – and hopefully adaptive – planning system.

Methodology

This paper presents results from a broader qualitative research project about social-ecological innovative regional planning in Costa Rica (Castro-Arce et al. 2019; Castro-Arce and Vanclay 2020a; Castro-Arce and Vanclay 2020b). The main research project focused primarily on the Huetar North region, using an example of a social innovation initiative that we call the 'parent case'. During the fieldwork, several other initiatives from other
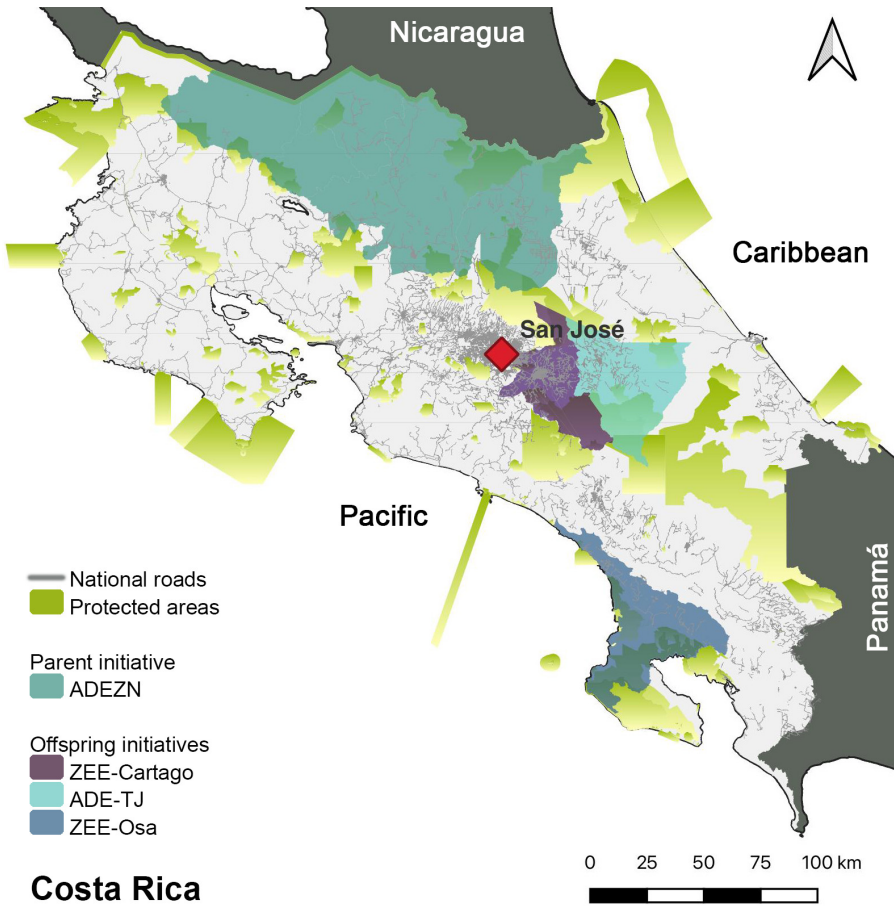
Figure 5.1. Location of the parent and the offspring initiatives. The area relate to the municipalities in which each of the initiatives work.

(Source: author based on geographical information data available at Registro Nacional, 2022 at http://www.snitcr.go.cr/)

regions of the country were mentioned as being offspring from the parent initiative. This created the opportunity to examine several other aspects of social innovation, especially the issue of replication. In this paper, we consider three cases that are 'offspring' projects (see Figure 5.1.). They came to public attention (and to the awareness of the lead author) by being showcased at a 2015 international conference on regional development by the Ministry of National Planning and Economic Policy (MIDEPLAN).
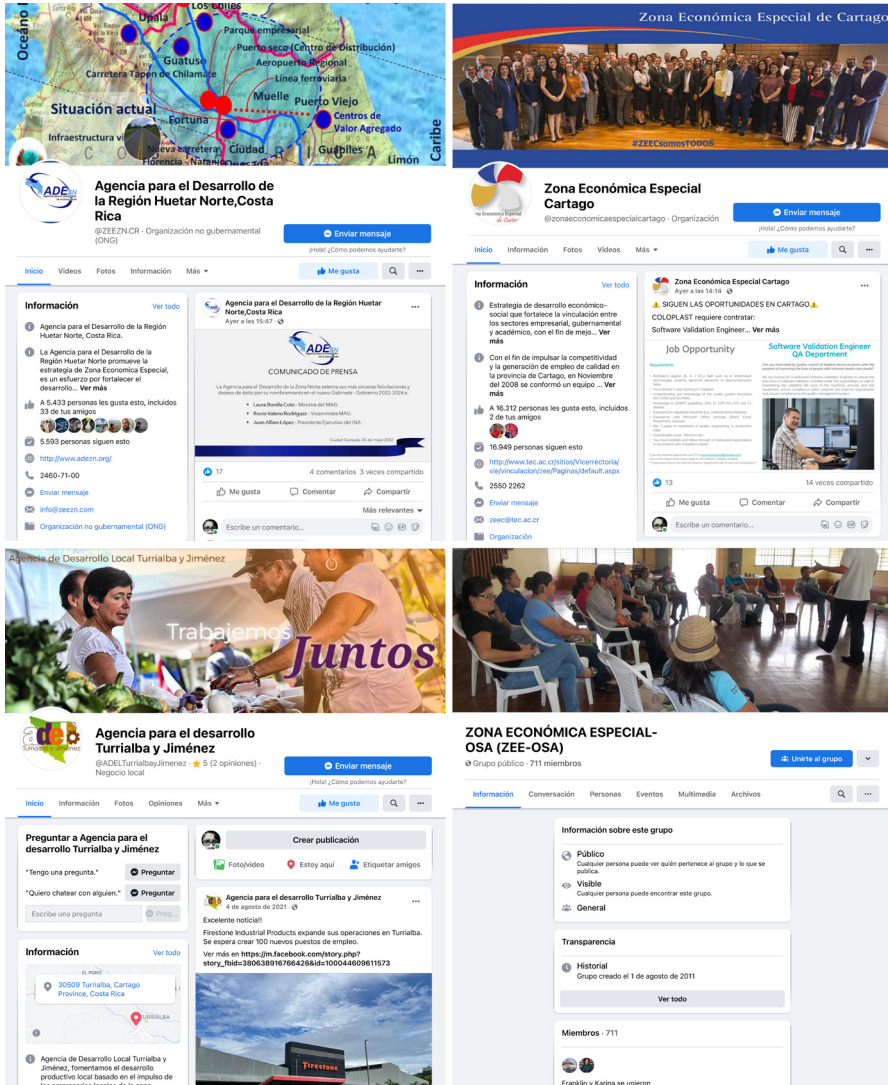
Figure 5.2. Social media platforms of the initiatives. Facebook is the only social media platform used by the parent case and the offspring. In the image is possible to see their ongoing activities.

(Source: author based on Facebook public profiles of each of the initiatives)

We followed a multiple case-study research approach (Yin 2009) using qualitative exploration of social innovation initiatives in Costa Rica. Our research can be characterised as being 'process tracing', a descriptive way of observing and interpreting the performance of each of the initiatives and their relations (Bennett and George 1997; Collier 2011). Primary data were obtained in 2013 and 2015 during two main field visits, of two and four months respectively. Further explorations were conducted to clarify

specific matters, including interviews, and tracking of news outputs and social media from 2015 to 2021. Several types of data were gathered and analysed using various methods: 49 semi-structured interviews; attendance at three events involving local practitioners and politicians; participant observation of some of various activities of the initiatives; analysis of relevant documents and online sources; and field observation of the initiatives' projects and the local environment. Many interviewees were selected because of their role in the initiatives. Others were identified by using snowball sampling. We also mapped the network of actors for each case. Informed consent was obtained for all interviews, and principles of ethical social research were observed (Vanclay et al. 2013). The interviews, which were conducted in Spanish, were audio recorded. In addition, extensive notes were taken in situ. All data was retained in Spanish. The extracts from the interviews selected for this paper were translated by the authors into English, not necessarily to provide a literal translation, but in an attempt to preserve the original meaning. Atlas.ti was used to assist in the management of data.

The research included questions and observations about exogenous and endogenous factors: triggering disruptions; characteristics of the socio-environmental context; institutional embeddedness; networks, actors, agents and leaders; organization's goals, structure and resources; failures and successes (Pradel et al. 2013; Castro-Arce and Vanclay 2020b). Furthermore, questions on the impact and scaling-up of the initiatives were investigated, including: scale (number of beneficiaries and geographical area); scope (sector(s) of intervention); and resonance (magnitude of impact in the social system) (Baker and Mehmood 2015). The familiarity of the lead author with Costa Rica and the specific study regions facilitated identification of the factors.

We used triangulation to validate information using our multiple data sources, and to crosscheck the theoretical construction (see for example Figure 5.2). We intentionally delayed theorization and the making of any conclusions about the success or otherwise of the replication of social innovation in order to fully consider all the evidence. We did a two-way comparative analysis: first, we explored each of the offspring against the parent case; and second, we contrasted each offspring's pathway against the others. This allowed us to test our empirical findings against the theoretical arguments about initiative emergence and replication from the fields of adaptive governance of SESs and social innovation (Mehmood 2016; Parés et al. 2017; Eizaguirre and Parés 2019; Folke 2019).

The parent and its offspring

Parent case: ADEZN

For over 20 years, the Agency for the Development of the North Zone (ADEZN) has been advocating for the development and improvement of wellbeing of the Huetar-North region, which comprises five rural municipalities in the northern part of Costa Rica, representing 19% of the national territory. ADEZN is a social innovation initiative born in

2001. Concern with its poor regional Human Development Index (HDI) results and the lack of employment options for current and future generations, a group of citizens from different sectors came together. At first, they thought that an industrial park might be the solution. After initial discussions, the group realized that they needed to understand better their regional assets, challenges and possibilities. They changed their goal from creating an industrial park to creating an investment environment suitable for a wider range of productive activities through improvement of the underlying social-ecological conditions of the region, e.g., its education, infrastructure, leisure opportunities, cultural attractions, and natural resources. Over the years, ADEZN has been implementing a strategic development agenda for Huetar-North, an agenda that is constructed and consulted by the varied regional actors.

Since its conception, the group has been a public-private initiative where academy, public institutions, producers and entrepreneurs, cooperatives, and civil society collaborate in development projects and to improve institutions and public policies. The main actors and supporters of the initiative have been TEC-Santa Clara (the local branch of a technical public university), the local agency of the Ministry of Agriculture (MAG), the INA (a public training institute), URCOZON (union of cooperatives of the north zone), and the local Chamber of Commerce. Two individuals were identified as being the masterminds of the initiative: Bernal Madriz, former rector of TEC Santa Clara; and Vladimir Arroyo, former president of the local Chamber of Commerce. The initiative consolidated in the form of an open association (*sociedad anónima*), because there was no formal legal entity to accommodate such agencies or public-private partnerships. The members of the association were there in their own right as individuals (not as representatives of institutions), although there was inclusion of the different sectors and institutional actors. Until 2020, there was an executive committee that managed the initiative, with the executives being one from TEC and the other from MAG, whose institutions donated their time. In 2020, when both executives retired, the executive role was taken over by the President of the association, who had always been a representative of the private sector. Till the time of writing (2022) at least, the operation of the initiative has been funded by donations and voluntary commitments from public institutions, private entrepreneurs, and cooperatives. ADEZN seeks to champion activities, but does not undertake them itself, thus it does not have responsibility for project budgets.

This social innovation initiative was interested in scaling-up – e.g. influencing institutional capacity and political agendas to attend to their region's needs – and scaling-out – e.g. extending their influence to other geographical areas – (Westley et al. 2014). Seeing that their efforts had impact and had scaled-up (by changing public and political awareness), this initiative also become a model or exemplar for some similar initiatives in other regions from Costa Rica (discussed below). A key role in mentoring other initiatives has been played by the former executive from TEC, Alfredo Aguilar, who today still tours from region to region assisting these other initiatives.

Offspring case A: ZEE-Cartago

The Economic Special Zone Cartago (ZEE-Cartago) was born in 2007 directly because of the interest of the TEC to ensure that there would be enough jobs for its graduates. The main campus is located in central Cartago, the smallest province in the country. Cartago is part of the great metropolitan area (GAM) and Central region. The initiative strives to create impact in the six municipalities that are in the influence zone of the campus. This area, which is 3% of Costa Rica, is predominantly urban with some rural characteristics. The aim of ZEE-Cartago was to serve as a bridge between the private sector and the university, with the intention of enhancing the supply of appropriate products and services by creating industry clusters, while at the same time attracting new investment. Collaborators of the initiative comprised the local governments, central government, the National Chamber of Commerce, INA, ASEPIC (the association of industrial parks), and JASEC (local electricity company). The founder of the initiative was Bernal Madriz, who was a member of the University Council at the time (and was responsible for ADEZN). ZEE-Cartago is not a formal legal entity because they are a permanent activity of the TEC University. Therefore, the initiative should be considered as a public venture, as all the support structures and funding came from public finances. Two project managers were in charge of the initiative, which received support from different departments of the university. ZEE-Cartago does not manage investment projects, their role is only to facilitate the links between actors, and to assess project proposals.

Offspring case B: ADE Turrialba-Jiménez

The Agency for the Development of Turrialba and Jiménez (ADE-TJ) started in 2013 as an initiative of the Rector of the INA national headquarters and the Mayor of Turrialba municipality as a way to fill the void of public institution interest in local development. This initiative comprises the other two municipalities of Cartago that are not of direct interest of ZEE-Cartago, Turrialba and Jiménez, rural territories that combined represent 3% of national land. The two municipalities are considered a sub-region in the convergence of Atlantic and Central regions, showing natural and social characteristics from both. The participant actors were a mix of hand-picked individuals, which snowballed the initiative intentions and managed to involve more partakers. Trying to emulate the structure of ADEZN, the academy sector and the producers have been the major players of the initiative, but were lacking direct public institutional involvement. They sometimes had a tense relationship with the local governments. Besides the local branch of INA, the academy sector included the three research universities with a campus in the region: the University of Costa Rica (UCR) with national public funding; the Tropical Agricultural Research and Teaching Center (CATIE), an international postgraduate school funded by Latin America and Caribbean countries; and EARTH University, an international private university with a focus on agricultural sciences. The initiative was legally registered as an association. It members came from the coffee, cacao, sugar cane, dairy, and tourism sectors, and from assembly plants (*maquila*). Personnel from the universities and the public sector are members of the association in their own right. Since the beginning, the initiative has had one formal executive assigned by INA, who considered herself to

be mentee of Alfredo Aguilar. In recent years, ADE-TJ is also receiving the support of another executive appointed by EARTH.

ADE-TJ is today a consolidated initiative aiming at local development primarily through endogenous synergies. From early on, the initiative recognised the traditional agro-industrial character of the region, and its touristic potential due to its diverse protected areas. The major challenge was the lack of business training and low capacity of the local entrepreneurs and producers. Currently, the initiative is preparing a regional development agenda, focusing on the improvement of social-ecological conditions that may impact directly on the wellbeing of local producers, entrepreneurs, and their collaborators. They support a melange of projects, e.g., specialized natural tourism routes, ways to capitalise on traditional cuisine, rethinking production regimes, industrial infrastructure, agribusiness training courses for women, and so on. ADE-TJ serves as a bridge between producers and public and private funding agencies. The initiative aligns producers with project proposals, provides budget management, and sometimes participates in project execution.

Offspring case C: ZEE Osa

Like ADEZN, the Economic Special Zone Osa (ZEE-Osa) was born out of the concern for the low HDI and development opportunities in Brunca region, a region with six municipalities, five of which are amongst the poorest in Costa Rica. ZEE-OSA comprised actors only from the Municipality of Osa, a rural area. It hoped that their efforts will have impact in the Osa, Golfito and Corredores municipalities, which are located on the border with Panamá, and were until 1985 a banana enclave. According to the interviewees, in 2011, during a pubic talk about public universities and their impact on regional development, Bernal Madriz from TEC and mastermind of ADEZN and ZEE-Cartago, suggested to replicate the ADEZN initiative in this region. The talk had a big effect on two public servants from Ministry of Health (MINSA), the national telecommunications and electricity company, ICE, and on the president of SURCOOP, an agriculture cooperative. The initiative was born in 2012 during a meeting organized by the three mentioned actors in which they invited selected people representative of cooperatives, water management associations, public institutions, local municipality, and UNED (public university). Some of them agreed to collaborate, but their role was unclear.

Osa is a unique municipality, its territory includes the Diquís UNESCO World Heritage Site, the Ramsar-listed International Sierpe Wetland, the Marino Ballena protected area in which four species of whales reproduce, and the Corcovado National Protected Area, which alone holds 2.5% of the world's biodiversity. Over 50% of Osa's territory has some kind of protective regulation, while the national average is 28%. Yet, ZEE-Osa failed to take advantage of this uniqueness, and focused their scope on international tourism and mega-infrastructure projects. Lacking of internal coordinators or initiative executives, plus open civil society support, the group was unable to trace a development strategy for the territory. The two projects they choose as flagship, Hydroelectric Power Plant Diquís, and Sierpe International Airport, were not theirs; on the contrary, were national

project proposals that remained under development for decades, until 2019, when both projects were discarded by the national government. Besides the failures of strategy and organization, in the region there are constantly too many initiatives competing at the same time, trying to gain the attention of central authorities. National and international aid had been the means by which social and ecological development projects are carried out since the State regain control of the lands after the enclave in 1985. At the time of the first contact research, 2015, we surveyed two other organisations trying to accomplish the same as ZEE-Osa: one organised only by representatives of public institutions for the whole Brunca region, and the other organised by a union of municipalities of the South-South. None survived. In 2019, ZEE-Osa lost its impetus, and its founding members dispersed.

Discussion: Was it a replication of social innovation?

The replication of social innovation is a presumption that is held by politicians, practitioners, and even scholars. In socially innovative entrepreneurship there is evidence that scaling-out through the replication of the organisation's configuration has been successful in some cases. Some famous cases include Alzheimer Café and Instock Restaurant in The Netherlands (van Lunenburg et al. 2020). However, the local development agencies in Costa Rica are not examples of social entrepreneurship. These agencies are not even formally recognised in the legislation of Costa Rica, in contrast to many countries, especially in Europe, where there are legal frameworks and models to apply(Canzanelli 2010; Canzanelli 2011). Indeed, social innovators, such as the founding individuals of ADEZN, still believe replication is possible. They have created or inspired the creation of offspring development agencies across Costa Rica, intending them to be clones of ADEZN. The three cases described in this paper showed that attempting to repeat the same format was not achievable and not appropriate. In fact, in the case of ZEE-Osa, was counterproductive (Mehmood 2016).

It could be tempting to assume that the background triggers, i.e. the local interests and context disruptions (Castro-Arce and Vanclay 2020b), were the same for all the cases, but this was not so. The three cases shared a common concern: unemployment in their region. For each of them, the challenge was different. For one, it was creating high-qualified positions; for another, it was opportunities for farmers; and for the other, it was creating effective networks. Comparing the three cases, the differences among them are evident: geographical span, regional assets, organisational structure, funding, public involvement, goals, projects, etc. There were very few similarities.

One of the interviewees for the ZEE-Osa case, at the time a very pro-active actor of the initiative, expressed his thoughts about copying ADEZN:

> "The idea [of copying ADEZN] is crazy. Some people from outside the region initiated a meeting to kickstart the ZEE-Osa. This [act of intervention by outsiders] is what we have frequently experienced in our territory. Maybe, maybe, we can manage to develop something like what they have done in San Carlos [referring to one of the municipalities in the Huetar-North region]. But, you need to consider the population, our population, its differences with the other populations. My point is that you need to consider culture. In our region, there are very few entrepreneurs, and most activity is subsistence farming, with only one or two transnational agroindustry operations, so the influence of the private sector is very little. In order to create a network of sectors, as they have in San Carlos, we need a different kind of culture." (Interview 2015-08-19 with a member of ZEE-Osa)

Nevertheless, ADEZN did inspire and guide an adaptation of their social innovation initiative. In this reproduction, the offspring are not clones, but are adapted versions of ADEZN. Each of the initiatives developed their structures in response to the needs they detected, their availability of resources and actors, and the governance system of which they were a part. Instead of replicability, adaptivity was the approach the two surviving cases (ZEE-Cartado and ADE-TJ) chose to follow, allowing the possibility to learn from ADEZN's experience while dealing with their own self-particularities (González and Healey 2005; Mehmood 2016). It could be argued that ADEZN was successful in reproducing itself, but a more important question is whether it successful in reproducing social innovation?

Comparing ZEE-Cartago and ADE-TJ with ADEZN, it is necessary to ponder whether the offspring of a social innovation is also a social innovation. Some scholars have argued that it is possible for social innovation for regional development to be reproduced, and that the offspring will continue to be social innovations, but only inasmuch as they embrace sustainability goals (Mehmood 2016) or that they are effective in empowering citizens (Eizaguirre and Parés 2019). Some key aspects of the discourse and actions of ADEZN – such as understanding the social-ecological logics, promoting projects with large positive territorial effects, fostering an investment environment to improve in the long term wellbeing of citizens, and influencing public policy – were absent in ZEE-Cartago, and were weak in ADE-TJ. Considering the important achievements of ADEZN and its transformative capacity as social innovation (Castro-Arce and Vanclay 2020b), it is not convincing that ZEE-Cartago and ADE-TJ qualify as being transformative or as being social innovation in the strict sense of these words.

Social innovation for regional development stems from an emergence process. Such emergence is exclusive to the space where it arises. Empirical evidence (Folke 2019) demonstrates that the factors that trigger the emergence process – like disruptions, including perceived or real crises, and the ways people think these may be addressed, key people that foster trust and provoke dialogues between actors, and the mobilization of ideas, communities, sectors to develop new or renewed networks – occur in a specific place and time (Massey 2005), and that these conditions cannot be artificially created.

Conclusion

In this paper, we discussed the possibility of a social innovation initiative scaling-out by replicating or reproducing itself. We focused on social innovation acting at the regional level trying to stimulate social-ecological regional development. We used the example of ADEZN, a successful and transformative social innovation initiative in the Huetar-North region of Costa Rica. ADEZN purposely influenced actors in other regions, and sought to develop a network of local development agencies that would improve regional conditions and transform the country's development pathway. Along with ADEZN, we explored three more initiatives that were born from its direct influence: ZEE-Cartago, ADE-TJ, and ZEE-Osa. Our evidence showed that the four initiatives were very different from each other, revealing that in this case, replication of social innovation was unsuccessful. Furthermore, with the guidance of ADEZN and sometimes direct involvement of its main actors, the reproduction of the social innovation initiative occurred via the adaptation of the concept of the initiative to the needs, institutional context, and social-ecological conditions of the regions, and thus, creating their own version of the initiative. The initiatives we studied developed their own coping mechanisms, such as organisational structure, funding schemes, forms of membership, and projects, adapting the example of ADEZN. As mentioned, ADEZN is a social innovation initiative that had been transforming the institutional landscape, as well as the social-ecological conditions of its region. Unfortunately, in the three offspring cases we analysed, this transformative capacity was very weak or absent. Our results opened a bigger question, because despite the social innovation initiative being able to reproduce itself, the offspring initiatives were not social innovations in themselves.

Social innovation for social-ecological regional development is an informal planning practice. However, social innovation still does have an effect in the planning system. Social innovation is an emergence in a particular territory, in a particular time. It is an outcome of discomfort and of unsatisfied socio-spatial needs. The growing interest in social innovation, especially because of the many success stories that have been reported, has tempted many people in policy, practice, and academia to see it as a panacea for all regional issues. Our parent case was a clear example of that wishful thinking. We argue that the belief that creating recipes for replicating social innovation as a way of taming the complexities of nested systems is ill-conceived. However, if social innovation can not be replicated (or if reproduced its ability to promote change is weak), this means that informal planning processes are even more fuzzy, nebulous and complex that previously thought. Trying to incorporate all the informal efforts and initiatives into the planning system would be futile and counterproductive. We agreed with the contemporary literature and practices of spatial – regional – planning that insist on the need for a more adaptive planning system, one that is more flexible. Flexibility is needed for understanding and embracing the multilevel and multiscalar social-ecological processes taking place, especially, those that are about sustainable development. Flexibility in the planning system is also needed for co-creating new or renewed institutional contexts in which the emergence of social innovation is supported, and its transformative capacity is fostered. We suggest that more research be done to

understand how and when social innovation is successfully reproduced, and how this successful reproduction affects the spatial planning system.

[1] ENDNOTES

1. https://www.facebook.com/ZEEZN.CR
2. At first, ADEZN called themselves an economic special zone, thinking about creating conditions for an industrial zone. The name persisted for some of the replica initiatives.
3. https://www.facebook.com/zonaeconomicaespecialcartago
4. https://www.facebook.com/ADELTurrialbayJimenez/
5. https://www.facebook.com/groups/188832054515001/about

References

Andonova, L.B. and Mitchell, R.B. 2010. The rescaling of global environmental politics. *Annual Review of Environment and Resources* 35, pp. 255–282.

Avelino, F., Wittmayer, J.M., Kemp, R. and Haxeltine, A. 2017. Game-changers and transformative social innovation. *Ecology and Society* 22(4), art41.

Baker, S. and Mehmood, A. 2015. Social innovation and the governance of sustainable places. *Local Environment* 20(3), pp. 321–334.

Bennett, A. and George, A.L. 1997. Process tracing in case study research. *MacArthur Foundation Workshop on Case Study Methods* October 17. Available at: https://uzh.ch/cmsssl/suz/dam/jcr:00000000-5103-bee3-0000-000059b16b9d/05.19.bennett_george.pdf

Berkes, F., Colding, J. and Folke, C. eds. 2003. *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge: Cambridge University Press.

Biggs, R., Westley, F. and Carpenter, S. 2010. Navigating the back loop: Fostering social innovation and transformation in ecosystem management. *Ecology and society* 15(2), art9.

Briassoulis, H. 1997. How the others plan: Exploring the shape and forms of informal planning. *Journal of Planning Education and Research* 17(2), pp. 105–117.

Canzanelli, G. 2010. *State of the art review on Local Economic Development Agencies*. ILS-LEDA International Link and Services for Local Economic Development Agencies.

Canzanelli, G. 2011. *Models of Territorial Development Agencies in Europe and in the world*. ILS-LEDA International Link and Services for Local Economic Development Agencies.

Castro-Arce, K., Parra, C. and Vanclay, F. 2019. Social innovation, sustainability and the governance of protected areas: Revealing theory as it plays out in practice in Costa Rica. *Journal of Environmental Planning and Management* 62(13), pp. 2255–2272.

Castro-Arce, K. and Vanclay, F. 2020a. Community-led green land acquisition: Social innovative initiatives for forest protection and regional development. *Land* 9(4), p. 109.

Castro-Arce, K. and Vanclay, F. 2020b. Transformative social innovation for sustainable rural development: An analytical framework to assist community-based initiatives. *Journal of Rural Studies* 74, pp. 45–54.

Certomà, C., Chelleri, L. and Notteboom, B. 2020. The 'fluid governance' of urban public spaces. Insights from informal planning practices in Rome. *Urban Studies* 57(5), pp. 976–995.

Certomà, C. and Notteboom, B. 2017. Informal planning in a transactive governmentality. Re-reading planning practices through Ghent's community gardens. *Planning Theory* 16(1), pp. 51–73.

Chaffin, B.C. and Gunderson, L.H. 2016. Emergence, institutionalization and renewal: Rhythms of adaptive governance in complex social-ecological systems. *Journal of Environmental Management* 165, pp. 81–87.

Collier, D. 2011. Understanding process tracing. *PS: Political Science and Politics* 44(4), p. 823.

Cooke-Davies, T., Cicmil, S., Crawford, L. and Richardson, K. 2007. We're not in Kansas anymore, Toto: Mapping the strange landscape of complexity theory, and its relationship to project management. *Project Management Journal* 38(2), pp. 50–61.

de Roo, G., Rauws, W. and Zuidema, C. 2020. Adaptive planning and the capacity to perform in moments of change. *Handbook on Planning and Complexity*, pp. 85–109.

Eizaguirre, S. and Parés, M. 2019. Communities making social change from below. Social innovation and democratic leadership in two disenfranchised neighbourhoods in Barcelona. *Urban Research & Practice* 12(2), pp.173–191.

European Commission 2013. *Guide to social innovation*. Available at: http://s3platform. jrc.ec.europa.eu/documents/20182/84453/Guide_to_Social_Innovation.pdf

Folke, C. 2006. Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change* 16(3), pp. 253–267.

Folke, C. 2019. Governing for emergence in social-ecological systems. In: Galaz, V. ed. *Global Challenges, Governance, and Complexity: applications and frontiers*. Cheltenham & Nothhampton: Edward Elgar Publishing, pp. 24–37.

Folke, C., Hahn, T., Olsson, P. and Norberg, J. 2005. Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources* 30(1), pp. 441–473.

Godin, B. 2012. Social innovation: Utopias of innovation from c.1830 to the present. *Project on the Intellectual History of Innovation* Working Paper No. 11. Available at: www.csiic.ca.

González, S. and Healey, P. 2005. A sociological institutionalist approach to the study of innovation in governance capacity. *Urban Studies* 42(11), pp. 2055–2069.

Harris, R. 2018. Modes of informal urban development: A global phenomenon. *Journal of Planning Literature* 33(3), pp. 267–286.

Healey, P. 2006. Transforming governance: Challenges of institutional adaptation and a new politics of space. *European Planning Studies* 14(3), pp. 299–320.

Hillier, J. 2000. Going round the back? Complex networks and informal action in local planning processes. *Environment and Planning A* 32, pp. 33–54.

Howaldt, J., Kaletka, C., Schröder, A. and Zirngiebl, M. eds. 2018. *Atlas of social innovation – New practices for a better future*. Dortmund: Sozialforschungsstelle, TU Dortmund University.

Imperiale, A.J. and Vanclay, F. 2016. Experiencing local community resilience in action: Learning from post-disaster communities. *Journal of Rural Studies* 47, pp. 204–219.

Imperiale, A.J. and Vanclay, F. 2021. Conceptualizing community resilience and the social dimensions of risk to overcome barriers to disaster risk reduction and sustainable development. *Sustainable Development* 29(5), pp. 891–905.

Kombe, W.J. and Kreibich, V. 2000. Reconciling informal and formal land management: An agenda for improving tenure security and urban governance in poor countries. *Habitat International* 24(2), pp. 231–240.

Loorbach, D., Wittmayer, J., Avelino, F., von Wirth, T. and Frantzeskaki, N. 2020. Transformative innovation and translocal diffusion. *Environmental Innovation and Societal Transitions* 35(January), pp. 251–260.

Massey, D. 2005. *For Space*. London: Sage.

McFarlane, C. 2012. Rethinking informality: Politics, crisis, and the city. *Planning Theory and Practice* 13(1), pp. 89–108.

Mehmood, A. 2016. Institutional forms of social innovation. *International Journal of Innovation and Sustainable Development* 10(3), p. 300.

Meijer, M. and Syssner, J. 2017. Getting ahead in depopulating areas - How linking social capital is used for informal planning practices in Sweden and The Netherlands. *Journal of Rural Studies* 55, pp. 59–70.

Miraftab, F. 2009. Insurgent planning: Situating radical planning in the global south. *Planning Theory* 8(1), pp. 32–50.

Moulaert, F. 2009. Social innovation: Institutionally embedded, territorially (re) produced. In: MacCallum, D., Moulaert, F., Hillier, J., and Vicari, S. eds. *Social innovation and territorial development*. UK: Ashgate Publishing Company, pp. 11–23.

Moulaert, F., MacCallum, D., Mehmood, A. and Hamdouch, A. 2013. General introduction: The return of social innovation as a scientific concept and a social practice. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 1-6.

Moulaert, F. and van den Broeck, P. 2018. Social innovation and territorial development. In: Jürgen Howaldt, Kaletka, C., Schröder, A., and Zirngiebl, M. eds. *Atlas of Social Innovation – New Practices for a Better Future*. Dortmund: Sozialforschungsstelle, TU Dortmund University.

Mulgan, G. 2007. *Social Innovation: What it is, why it matters and how it can be accelerated*. London: The Young Foundation.

Neumeier, S. 2012. Why do social innovations in rural development matter and should they be considered more seriously in rural development research? – Proposal for a stronger focus on social innovations in rural development. *Sociologia ruralis* 52(1), pp. 48–69.

Novikova, M. 2021. Transformative social innovation in rural areas: Insights from a rural development initiative in the Portuguese region of Baixo Alentejo. *European Countryside* 13(1), pp. 71–90.

Olsson, P. and Galaz, V. 2012. Social-ecological innovation and transformation. In: *Social innovation. Blurring Boundaries to Reconfigure Markets*. London: Palgrave Macmillan UK, pp. 223–247.

Olsson, P., Gunderson, L.H., Carpenter, S.R., Ryan, P., Lebel, L., Folke, C. and Holling, C.S. 2006. Shooting the rapids: Navigating transitions to adaptive governance of social-ecological systems. *Ecology and Society* 11(1), art18.

Olsson, P., Moore, M.-L., Westley, F.R. and McCarthy, D.D.P. 2017. The concept of the Anthropocene as a game-changer: A new context for social innovation and transformations to sustainability. *Ecology and Society* 22(2), p. art31.

Parés, M., Ospina, S.M. and Subirats, J. 2017. Social innovation and relational leadership: Opening up new perspectives on social change. In: *Social Innovation and Democratic Leadership*. Edward Elgar Publishing, pp. 3–20.

Pradel, M., García, M. and Eizaguirre, S. 2013. Theorizing multi-level governance in social innovation dynamics. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook of Social Innovation Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 155–168.

Randolph, R. 2017. Subverting the present, planning the future: Proposing a counter-planning. In: *Spaces of dialog for places of dignity* (July) Lisbon: AESOP. Available at: https://www.academia.edu/33304987/Subverting_the_Present_Planning_the_Future_Proposing_a_Counter-Planning

Rivera-Arriaga, E., Williams-Beck, L., Vidal Hernández, L.E. and García Arjona, M.E. 2021. Crafting grassroots' socio-environmental governance for a coastal biosphere rural community in Campeche, Mexico. *Ocean & Coastal Management* 204(2021) p. 105518.

Schneider, P., Walz, A., Albert, C. and Lipp, T. 2021. Ecosystem-based adaptation in cities: Use of formal and informal planning instruments. *Land Use Policy* 109, p. 105722.

Syssner, J. and Meijer, M. 2017. Informal planning in depopulating rural areas: A resource-based view on informal planning practices. *European Countryside* 9(3), pp. 458–472.

Tsenkova, S. 2012. Urban planning and informal cities in southeast Europe. *Journal of Architectural and Planning Research* 29(4), pp. 292–305.

van Assche, K., Beunen, R. and Duineveld, M. 2014. Formal/informal dialectics and the self-transformation of spatial planning systems: An exploration. *Administration and Society* 46(6), pp. 654–683.

van Dyck, B. and van den Broeck, P. 2013. Social innovation: a territorial process. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 131–141.

van Lunenburg, M., Geuijen, K. and Meijer, A. 2020. How and why do social and sustainable initiatives scale? A systematic review of the literature on social entrepreneurship and grassroots innovation. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 31(5), pp. 1013–1024.

Vanclay, F., Baines, J.T. and Taylor, C.N. 2013. Principles for ethical research involving humans: Ethical professional practice in impact assessment Part I. *Impact Assessment and Project Appraisal* 31(4), pp. 243–253.

Westley, F., Antadze, N., Riddell, D.J., Robinson, K. and Geobey, S. 2014. Five configurations for scaling up social innovation. *The Journal of Applied Behavioral Science* 50(3), pp. 234–260.

Westley, F.R., Tjornbo, O., Schultz, L., Olsson, P., Folke, C., Crona, B. and Bodin, Ö. 2013. A theory of transformative agency in linked social-ecological systems. *Ecology and Society* 18(3), art27.

Yin, R.K. 2009. *Case study research: Design and methods*. London: Sage Publications.

CHAPTER

6

CONCLUSION

Conclusion

Introduction

Researching regions, regional development and sustainability, as with any other investigation about space and territoriality, requires that the problem be broken down into component parts and that, due to the complexity of the phenomenon, there be specialised scholarship into the relevant topics. However, as expressed by Madanipour (2013), in this process, the fields of knowledge, as well as theory from practice, often need to be disentangled. This becomes challenging, because in complex systems, problems, solutions, knowledges, research and action are interrelated. Madanipour insists that "knowledge and action … need to be re-connected to facilitate the necessary conditions for addressing the current problems and fostering the emergence of new ideas and practices" (2013, p.373). Moreover, complexity is poorly understood when its parts are isolated from each other; rather it is more enlightening to explore its emergent and entangled dynamics (Westley et al. 2014). Therefore, in this thesis, I offered a multidisciplinary approach that connects social, economic and environmental knowledges to explain regional development phenomena. Furthermore, I not only considered theoretical knowledge, I also explored empirically the histories, actions, relations, and outcomes of local organisations, and by this, opened-up discussion and feedback between theory and practice.

The primary aim of the PhD was to help in understanding how social innovation, as a proactive response within regions, influences flexible governance processes of social-ecological systems, socio-spatial transformations, and sustainable development. To achieve this research aim, I developed one general objective: through a combination of theory and practice to provide evidence about how governance systems and planning cultures actually 'play out in practice'. For this purpose, I used a case-study research methodology to examine: the Huetar-North region in Costa Rica; the Juan Castro Blanco Water National Park; and six social innovation initiatives (APANAJUCA, AFAMAAR, ADEZN, ZEE-Cartago, ADE-TJ, and ZEE-Osa). I used a social-ecological systems lens for that examination, and explored theories on social innovation, adaptive planning and governance, and regional spatial planning.

The main question that guided this research was: **How can social innovation contribute to spatial transformation and sustainable regional development?**

Key findings of the research

In exploring for answers to my research question, three significant conclusions arose. First, *social innovation has the potential to be transformative.* This means that it is possible for social innovation to transcend the local and have an impact on wider geographical scales and political levels, pushing the territory and the governance systems towards more sustainable development. Through my research, I identified three ways social innovation can do this: (1) pursuing – and acting upon – the greater good and benefit for all; (2) scaling up and out provoking changes in the governance system; and (3) developing bottom-linked governance along with actors from public institutions and academia sector. These ways are not mutually exclusive.

Second, *social innovation is important in adaptive governance processes*. Social innovation improves the ability of a region to address challenges, such as economic crises or socio-environmental needs by creating opportunities to enhance the social-ecological system. Social innovation adds to the institutional diversity, and, when developing bottom-linked governance, entangles a structure of nested institutions; both conditions for an optimal adaptive governance system (Dietz 2003; Chaffin et al. 2014). Regions constantly face uncertainty and risk, aspects to which social innovation, as a self-organized response, reacts proactively (i.e. tends to initiate change and is anticipatory). One important characteristic that enhances proactivity is that the social innovation process is iterative (Castro-Arce et al. 2019). When social innovation acts upon satisfying the needs of people and regions, it is simultaneously altering the original context in which the crises arose; and in so doing, creates new opportunities, and also new spaces for new disturbances to occur, because the context in which societies operate (especially their continuity, stability and resilience) are affected. Westley and Antadze (2010) explained this dynamic as the *paradox of agency*, because the context, rules, and beliefs that set the structure and limits to people are also the substance people harness to create novelty. Therefore, social innovation is an agent that could enhance the region, preserving the complexity of the social-ecological system by means of its non-linear interactions, and the unintended, autonomous, self-organised, and/or intuitive reactions of people. The adaptive capacity of the region and of the governance system is increased through this process.

Third, *social innovation facilitates more flexible, inclusive, and effective spatial planning*. Flexibility in planning is necessary for understanding and navigating the multilevel and multiscalar social-ecological processes taking place in regions. Furthermore, is essential to embrace the intertwinedness of humans and nature, and of systems within systems. Flexibility is also needed for co-creating new or renewed institutional contexts, i.e., more adaptive governance contexts. In these, the emergence of social innovation is better supported, and its transformative capacity is fostered. Inclusive spatial planning acts upon the improvement of community wellbeing, by creating spaces of collaboration that involve non-traditional actors, and those with limited power and resources, or marginalized. Because spatial planning is flexible, and inclusive, it is also more effective. Both conditions foster an environment for bottom-linked governance to prosper, in which

actors and sectors meet to share decision-making. Furthermore, in developing bottom-linked governance, the actors would have to reconcile differences and grievances, thus, facilitating decision-making, and implementing actions towards sustainability more effectively.

Considerations for the field of spatial planning and environment

The above conclusions are important because they bring opportunities – and challenges – enriching the field of spatial planning and environment. The special focus placed in this PhD research on regions, regional development and adaptive capacity, which is explored through empirical evidence and theoretical discussion of social innovation, brings attention to some questions: What can regional planning and social innovation learn from each other, in theory and practice, especially in the context of the governance of social-ecological systems? What opportunities and challenges do this ensemble of theories bring to regional development in analysis and practice? Does social-ecological systems theory adequately explain a dynamic and dialectic relationship between social innovation and regional spatial planning?

Regions can be spatial units, formally demarcated areas in national or supranational plans; regions can be people and communities sharing and building their place and context, as well. Regions are social constructs and because of that recent discussion about regions and regional development focuses on the "social practices through which regions are constructed, gain their meanings, are reproduced, and ultimately destroyed or abandoned as part of a wider socio-spatial transformations" (Paasi et al. 2018, p.3). In this thesis, regions were understood as social-ecological systems in order to recognise the intertwinedness of people and nature, and the ways they shape each other, building up these complex systems. Regional development needs to be understood as a continuous process, and explored considering the multilevel and multiscalar dynamics of which regions are part of. At any scale, transformations in the governance systems, shifts in power relations, economic crises, and environmental challenges are embedded in the socio-spatial dynamics structuring regions. Analysing the ways communities, and social actors in general, respond to such disruptions, especially when effectively attending social-ecological needs and concerns is key for sustainable development.

My research demonstrated that social innovation fostered bottom-linked governance, that is, a multi-level middle ground where actors from various political levels, geographical scales and industry sectors come together to share decision-making (Pradel et al. 2013; Castro-Arce and Vanclay 2020). Bottom-linked governance is a space of action and co-creation. What would spatial planning in bottom-linked governance look like? Such planning must be conceived to deal with tensions and mismatches of levels, scales, and sectors, not just to negotiate for end results, but aim to connect these spaces and people with wider structures. Bottom-linked planning should also help the varied actors and institutions within a territory in understanding the intertwinedness of the

social-ecological systems. Moreover, spatial planning in bottom-linked governance must facilitate innovation in how things are done and how relations have been fostered, having the capacity to influence actors to develop sustainable socially innovative practices.

Bottom-linked governance needs bridging institutions, i.e., institutions that have the potential to influence other institutions, governance systems, and the degree of empowerment of social groups. In the practice, regional spatial planning must become a bridging institution. To have the capacity to deal with tensions and mismatches that arise in the negotiations and decision-making over the territory, planning practice should be able to influence the way crises are understood, problems are assessed, and needs satisfied, helping in the construction of the collective visions. However, to overcome the barriers of collaboration, planners must gain the trust of actors, institutions, and communities in the governance system. Trust is constructed by being clear and transparent, and by opening up the rules of governance. Trust is also built when the roles of each participant institution are respected, with no impositions, and limited intervention in the local processes of communities. Planning practice must bridge, assess, and facilitate the reduction of the costs of collaboration enhancing the benefits of all.

The processes of social innovation that aim at improved territorial development and wellbeing become part of the planning system of a region. As discussed in this PhD thesis, social innovation is an informal process because it is self-organised and spontaneous; social innovation would never have its origins through a top-down command or decree. Social innovation initiatives normally develop outside or entangled with formal rules, regulations, government agencies, or public/private partnerships constituted for social-economic and/or environmental development purposes; thus, becoming informal planning practices. Nevertheless, if social innovation is to be transformative and procure a more social-ecological regional development, it must take steps into more formal processes. In the critical success factors proposed in this thesis, three are remarkably important for social innovation initiatives to be successful in the planning system and deliver better – multilevel – sustainability outcomes: acknowledge that social innovation must scale up and out; acknowledge that formal institutions, policies and regulations are needed for both regional development and fostering more social innovation; and acknowledge that power needs to be shared, especially in a bottom-linked, adaptive governance system.

My research, as well as that of others (Briassoulis 1997; van Assche et al. 2014; Meijer and Ernste 2019), showed that spatial planning needs to embrace informality. But, informal, in this case social innovation, is suspicious, or at least controversial (Abad and Ezponda 2021). How are the needs of communities satisfied, who is to benefit, how are some benefiting, why are chosen certain paths for decision-making, and who made the choice, what is negotiated, who is to control that the things are going as they were planned, are the initiatives accountable? These and more questions are commonly asked by scholars, public institutions, organisations, actors, and people within communities, as my research revealed. There are always interconnections and interconnectedness between actors, expectations, benefits, and beneficiaries of social innovation. Therefore, as mentioned earlier, trust and transparency are needed. By definition, the ways social innovation address community interests necessarily involve socio-political mobilization,

which will normally lead to empowerment of communities (Moulaert et al. 2005; Moulaert et al. 2013). In a bottom-linked governance system, such processes are at the centre of the middle-ground where actors and institutions meet. Thus, despite being an informal process, social innovation when not co-created is at least endorsed by the system. An understanding of these informal processes is needed for planners coming from a formal context, because it will help them navigate the institutional framework, and also, be more capable of developing a bridging role in a renewed – adaptive – governance system.

Throughout this research, I have argued that the ultimate goal of regional spatial planning should be to foster social-ecological development. Of course, this is an ideal state with considerable levels of sustainability, resilience, and community wellbeing. Under the right conditions, e.g., enabling factors and critical success factors described in Chapter 3, bottom-linked governance together with social innovation and adaptive planning practices could result in a process of transformation that leads to social-ecological regional development (SERD). SERD embraces continuous change, and recognises the capacity of local organisations to address their needs through a process of shared decision-making. SERD transcends the local and regional spaces to provoke transformation at multiple scales and political levels. SERD transcends the social-ecological system of the region to become intertwined with the various systems that facilitate adaptation and change for humans and nature alike. Undoubtedly, acting towards SERD involves changing hegemonic socio-political structures, therefore profound change will have to take place.

For such change to occur, institutions, and social actors in general, need to develop adaptive capacity. However, adaptive capacity in a context of and for social-ecological transformation is more than being reactive to crises, it implies to anticipate change and having the ability to influence more sustainable development trajectories (Imperiale and Vanclay 2021). As insisted in this thesis, there is a need to be proactive. Social relations are key in building adaptive capacity because, through these, knowledge and resources are shared, mechanisms of support are created, and trust is developed (Barnes et al. 2017). It is true that uncertainties that surface through the interactions of social-ecological systems, and through the crises that provoke thresholds, provide stimulus for innovation (Berkes et al. 2003; Plowman et al. 2007). As demonstrated in this thesis, a clear example is social innovation, which at its simplest, can be defined as innovation in social relations to satisfy social-ecological needs. But social innovation plays a bigger role in social-ecological systems than just fulfilling needs. Social innovation within social-ecological systems: is a result of the interactions and actions among levels and scales of social-ecological systems; is a response provided by the governance system in face of conflicts, crises or needs; is the emergence of new levels of exchange and interaction, as well as, governance systems and norms; is the shaping and transformation of the system – social, natural, spatial settings – into renewed resources, components and relations; and is a way of empowerment, especially for those usually marginalised. Through social innovation, institutions and social actors enhance their adaptive capacity, mobilising the region towards a more social-ecological regional development (SERD).

To achieve SERD, in regional planning regions must be understood as social-ecological systems, therefore all the dynamics of the territory, the landuses, the management

systems, actors, and transactions between actors, need to be part of the planning process. In Costa Rica, and elsewhere, protected areas (PAs) often receive a 'fence and forget' treatment that stretches, depending on the case, from 'allowing nature to take its course', to decoupling communities from their traditional practices in PAs, to detaching the PA from local development plans (Pearce et al. 2003; Hoole and Berkes 2010; Hill et al. 2016). In this thesis, the significance of PA for regional sustainable development was widely discussed. Furthermore, it was shown that there is a clear nexus between biodiversity conservation, land productivity, hydro-electricity generation, drinking water supply, other economic activities, and cultural practices. The cases discussed in this thesis, offered a view of planning practices in which, through social innovation initiatives, PA management and local and regional socio-economic development are fully integrated. Moreover, these two issues become one in social-ecological systems governance; given that, for the actors of those initiatives, the value of biodiversity conservation is very evident (Pearce et al. 2007).

Using an SES perspective for the examination of literature on social innovation and regional spatial planning helped in many ways. It helped in contextualising the social-ecological challenges and the needs of communities by envisioning the intertwinedness of people and nature. It also helped in understanding the reciprocities, the imbalances, and feedbacks in the creation or renewal of social relations. Moreover, a SES perspective place these social relations at the centre of the situations and circumstances when the varied actors and institutions make choices in search of sustainable development. Elinor Ostrom encouraged to see through this lens, as this is the way to confront and explore the complexity of a SES without reducing it. She argued:

> "We do not need to be complex, just to be complex. But we need to get over our simplicity hang-ups … 'keeping it simple' is a stupid response, when what we are studying are complex social-ecological system that are nested into many levels. Obviously, our theories will always be simpler than the world we study. Otherwise, we are trying to reproduce the world itself rather than theories about the world that can be tested." (Ostrom 2012, p.129).

Through a SES perspective, in my research I was able to advance a dialectic relationship between social innovation and regional spatial planning, placing adaptive governance as an aspiration for both. I described adaptive governance as inclusive, horizontal and sensitive to the context of the SES, facilitating collaboration between actors and institutions. Adaptive governance encourages regional development to be social-ecological, where the planning system and the planning practice is flexible, capable of addressing the uncertainty, diversity and spontaneity of society, and the social and environmental challenges it faces. In such regional development, people and nature will not only adapt together, but will bounce forward (Davoudi 2012) into an improved region.

Final reflection and suggestions for further research

As a result of this PhD research, the outputs presented in Chapters 2 to 5 offered several important findings and theoretical propositions for the field of spatial planning and environment, and many other areas of literature. First, the understanding of several key concepts was enhanced (e.g., protected area, region, multilevel governance, adaptive governance, resource management, social innovation, scaling, bridging institutions, bottom-linked governance, green land acquisition, informal planning practice). Some of these were tested using empirical evidence (e.g., social innovation, land grabbing, transformative social innovation, bottom-linked governance, and replication of social innovation). Second, the research explored the relationship and impact of social innovation in regional development through varied situations (e.g., protected area governance, land management, infrastructure development projects, socio-economic development, tourism, etc). Third, I developed and tested an analytical framework for transformative social innovation with the intention of understanding and revealing how social innovation contributes to system change. This framework has the strength that is not only useful for scientists explaining social innovation potential and limitations, but also could be considered by planning practitioners, policy makers and social innovators as a roadmap to guide their efforts if transformation of the region and wellbeing improvement are their ultimate goals. Fourth, presented arguments to question the replication of social innovation as a panacea formula to attend to social-ecological challenges and crises elsewhere. And fifth, this PhD research provided empirical evidence on how social innovation processes, governance mechanisms and planning practice actually 'play out in practice' shaping the pathways and history of a region.

This research opened up spaces to formulate further questions and connections with different bodies of literature. I suggest that research could consider the following topics in the future: (a) from a historic perspective, the relationship between path-dependency and what hinders and fosters transformative social innovation in regions; (b) from a democratic point of view, the relationship between social innovation and new or renewed ways of democracy, and also, the 'blacks, whites, and grays' of informal planning practices in well-established democratic regimes; (c) using power related literature, to understand further the ways in which bottom-linked governance is developed and decision-making negotiated; (d) from a knowledge production and diffusion perspective, to explore the role of social innovation initiatives in bringing transdisciplinary wisdom to spatial planning system and practice; and (e) from within the social innovation discourse, to further question if the resulting new initiatives of rolling-out social innovation can also be considered as social innovations, and if so, under what conditions.

References

Abad, A.G. and Ezponda, A.G. 2021. Controversies in social innovation research. *Innovation: The European Journal of Social Science Research*, pp. 1–21. doi.org/10.1080/13511610.2021.1964348

Barnes, M.L., Bodin, Ö., Guerrero, A.M., McAllister, R.R.J., Alexander, S.M. and Robins, G. 2017. The social structural foundations of adaptation and transformation in social-ecological systems. *Ecology and Society* 22(4), art16.

Berkes, F., Colding, J. and Folke, C. eds. 2003. *Navigating social-ecological systems. Building resilience for complexity and change*. Cambridge, UK: Cambridge University Press.

Briassoulis, H. 1997. How the others plan: Exploring the shape and forms of informal planning. *Journal of Planning Education and Research* 17(2), pp. 105–117.

Castro-Arce, K., Parra, C. and Vanclay, F. 2019. Social innovation, sustainability and the governance of protected areas: Revealing theory as it plays out in practice in Costa Rica. *Journal of Environmental Planning and Management* 62(13), pp. 2255–2272.

Castro-Arce, K. and Vanclay, F. 2020. Transformative social innovation for sustainable rural development: An analytical framework to assist community-based initiatives. *Journal of Rural Studies* 74, pp. 45–54.

Chaffin, B.C., Gosnell, H. and Cosens, B.A. 2014. A decade of adaptive governance scholarship: Synthesis and future directions. *Ecology and Society* 19(3), art56.

Davoudi, S. 2012. Resilience: A Bridging Concept or a Dead End? *Planning Theory & Practice* 13(2), pp. 299–307.

Dietz, T., Ostrom, E. and Stern, P.C. 2003. The struggle to govern the commons. *Science* 302(5652), pp. 1907–1912.

Plowman, D.A., Baker, L.T., Beck, T.E., Kulkarni, M., Thomas Solansky, S. and Villarreal Travis, D. 2007. Radical change accidentally: The emergence and amplification of small change. *Source: The Academy of Management Journal* 50(3), pp. 515–543.

Hill, J., Terry, A. and Woodland, W.A. eds. 2016. *Sustainable development: national aspirations, local implementation*. Routledge.

Hoole, A. and Berkes, F. 2010. Breaking down fences: Recoupling social–ecological systems for biodiversity conservation in Namibia. *Geoforum* 41(2), pp. 304–317.

Imperiale, A.J. and Vanclay, F. 2021. Conceptualizing community resilience and the social dimensions of risk to overcome barriers to disaster risk reduction and sustainable development. *Sustainable Development* 29(5), pp. 891–905.

Madanipour, A. 2013. Researching space, transgressing epistemic boundaries. *International Planning Studies* 18(3–4), pp. 372–388.

Meijer, M. and Ernste, H. 2019. Broadening the scope of spatial planning: Making a case for informality in the Netherlands. *Journal of Planning Education and Research*, pp. 1–14. doi.org/10.1177/0739456X19826211

Moulaert, F., MacCallum, D. and Hillier, J. 2013. Social innovation: Intuition, precept, concept, theory and practice. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 13–24.

Moulaert, F., Martinelli, F., Swyngedouw, E. and Gonzalez, S. 2005. Towards alternative model(s) of local innovation. *Urban Studies* 42(11), pp. 1969–1990.

Ostrom, E. 2012. Why do we need to protect institutional diversity? *European Political Science* 11(1), pp. 128–147.

Paasi, A., Harrison, J. and Jones, M. 2018. New consolidated regional geographies. In: Paasi, A., Harrison, J., and Jones, M. eds. *Handbook on the Geographies of Regions and Territories*. Edward Elgar Publishing, pp. 1–20.

Pearce, D., Hecht, S. and Vorhies, F. 2007. What is biodiversity worth? Economics as a problem and a solution. In: MacDonald, D. and Service, K. eds. *Key Topics in Conservation Biology*. Blackwell Publishing, pp. 35-45.

Pearce, D., Putz, F.E. and Vanclay, J.K. 2003. Sustainable forestry in the tropics: panacea or folly? *Forest Ecology and Management* 172, pp. 229–247.

Pradel, M., García, M. and Eizaguirre, S. 2013. Theorizing multi-level governance in social innovation dynamics. In: Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. eds. *The International Handbook of Social Innovation Collective Action, Social Learning and Transdisciplinary Research*. Cheltenham, UK and Northampton, USA: Edward Elgar, pp. 155–168.

van Assche, K., Beunen, R. and Duineveld, M. 2014. Formal/informal dialectics and the self-transformation of spatial planning systems: An exploration. *Administration and Society* 46(6), pp. 654–683.

Westley, F. and Antadze, N. 2010. Making a difference: Strategies for scaling social innovation for greater impact. *The Innovation Journal: The Public Sector Innovation Journal* 15(2), pp. 1–19.

Westley, F., Antadze, N., Riddell, D.J., Robinson, K. and Geobey, S. 2014. Five Configurations for Scaling Up Social Innovation. *The Journal of Applied Behavioral Science* 50(3), pp. 234–260.

EXECUTIVE SUMMARY

SAMENVATTING

Samenvatting

Wetenschappers, praktijkmensen, beleidsmakers en gemeenschappen uiten op grote schaal hun bezorgdheid over milieucrises, sociaaleconomische kwetsbaarheden en gezondheidsbedreigingen. Het tempo van deze sociale en ecologische veranderingen, en de omvang van de effecten ervan, hebben geleid tot vraagtekens bij de huidige manier van bestuur en ruimtelijke ordening. Als de mensheid ons welzijn en dat van de toekomstige generaties wil verbeteren, zijn transformaties van sociale relaties en bestuursprocessen nodig. Tevens moet het bewustzijn groeien dat mens en natuur wederzijds afhankelijk van, en verweven met, elkaar zijn. De term sociale innovatie wordt steeds vaker gebruikt in overheidsbeleid en in academisch onderzoek om sociaaleconomische verbetering en duurzame ontwikkeling te stimuleren. Er is echter behoefte aan een beter begrip van sociale innovatie als een concept om op een proactieve manier sociale en ecologische uitdagingen binnen regio's aan te pakken en tegelijkertijd de ruimtelijke ordening en bestuursprocessen te beïnvloeden, zowel in theorie als in de praktijk. De belangrijkste onderzoeksvraag die aan dit onderzoek ten grondslag ligt was dan ook: Hoe kan sociale innovatie bijdragen aan ruimtelijke transformatie en duurzame regionale ontwikkeling?

In dit proefschrift zijn de concepten regio's, regionale ontwikkeling en adaptief vermogen onderzocht door een sociaal-ecologisch systeem (SES) perspectief. Een SES-lens maakt het mogelijk om de verwevenheid van mens-natuurrelaties en hun terugkoppelingen te bestuderen. Literatuur uit verschillende vakgebieden - waaronder adaptieve planning en governance, regionale ruimtelijke planning, beheer van beschermde gebieden, management van landgebruik en hulpbronnen, instituties en institutionele capaciteit, en veerkracht - is gecombineerd met de literatuur over sociale innovatie met als doel om middels kruisbestuiving tot nieuwe inzichten te komen. Specifiek is gekeken naar een reeks deelvragen: Wat kunnen ruimtelijke ordening en sociale innovatie van elkaar leren, in zowel theorie als praktijk, vooral in de context van het besturen van sociaal-ecologische systemen? Welke kansen en uitdagingen bieden deze theorieën voor regionale ontwikkeling in analyse en praktijk? Verklaart de sociaal-ecologische systeemtheorie voldoende een dynamische en dialectische relatie tussen sociale innovatie en regionale ruimtelijke ordening?

In duurzaamheids- en sociaal-milieuonderzoek is de grens vaak vaag tussen het fenomeen zelf en de context waarin het wordt bestudeerd. Om deze reden is in dit onderzoek de methodologie van case-study onderzoek gebruikt om sociale innovatie als een proactieve manier van bestuur binnen regio's empirisch te analyseren. In dit proefschrift is onderzocht wat de invloed is van sociale innovatie op flexibele bestuursprocessen van sociaal-ecologische systemen, sociaal-ruimtelijke transformaties en regionale duurzame ontwikkeling. Dit is gedaan door een case-study van de regio Huetar-Noord in Costa Rica. Het onderzoek stond in het teken van het begrijpen van de dynamiek in en om de regio als geheel, maar ook van hoe deze regio zich verhoudt tot

een specifiek beschermd gebied (het Juan Castro Blanco Water National Park). Tevens is de relatie onderzocht tussen de regio en twee sociale innovatie-initiatieven (ADEZN en APANAJUCA) en is bestudeerd hoe verschillende andere lokale en nationale initiatieven door hen werden beïnvloed (AFAMAAR, ZEE-Cartago, ADE-TJ en ZEE-Osa). Als onderdeel van het case-study-onderzoek zijn verschillende soorten data en bronnen gebruikt en zijn verschillende technieken voor het verzamelen van data en data-analyse toegepast. Het empirische onderzoek omvatte 87 interviews; participatieve observatie tijdens dertien bijeenkomsten; het bijwonen, op persoonlijke uitnodiging, van twee congressen (een nationaal en een internationaal); verkenning en observatie van de context door middel van vijf veldwerk periodes; en follow-up van de activiteiten van de sociale innovatie-initiatieven via sociale media. Gedurende het hele onderzoek zijn ethische principes van sociaalwetenschappelijk onderzoek in acht genomen.

Het onderzoek leverde drie belangrijke conclusies op:

- *Sociale innovatie heeft het potentieel om transformatief te zijn.* Transformatie is mogelijk als sociale innovatie-initiatieven verder reiken dan lokale processen en wanneer resultaten bereikt worden op grotere geografische schalen en politieke niveaus. Als dit plaatsvindt kan er grote impact zijn op het grondgebied, op bestuurssystemen en zelfs op de houding van mensen. Sociale innovatie maakt dit mogelijk door in te spelen op het grotere geheel, op- en af te schalen, en een middenweg van governance te ontwikkelen waar actoren uit verschillende sectoren samenkomen, namelijk *bottom-linked governance*.

- *Sociale innovatie is belangrijk in adaptieve bestuursprocessen*. Volgens dit onderzoek bevordert sociale innovatie adaptieve manieren van bestuur, omdat het de betrokkenheid van verschillende actoren mogelijk maakt. Daarmee stimuleert het een diversiteit aan waarden, belangen en perspectieven en bovendien moedigt het aan om verschillende managementmethoden uit te proberen. Uiteraard kunnen er conflicten ontstaan in dit proces, maar een van de voorwaarden voor succesvolle sociale innovatie is het kunnen verzoenen tussen actoren wanneer er conflicten zijn.

- *Sociale innovatie maakt meer flexibele, inclusieve en effectieve ruimtelijke ordening mogelijk.* De praktijk - en theorie - van ruimtelijke planning wordt verbeterd door de processen, acties en resultaten van sociale innovatie. Ruimtelijke planning kan verbeteren en effectiever zijn in een adaptief bestuurssysteem omdat de dynamiek die op meerdere niveaus en schalen in regio's plaatsvindt beter kan worden begrepen, er meer ruimte is voor samenwerking waarbij niet-traditionele actoren betrokken zijn, en de institutionele context kans op vernieuwing en verandering in zich heeft.

Dit onderzoek biedt een aantal belangrijke inzichten voor zowel de theorie als de praktijk, vooral op het gebied van het besturen van sociaal-ecologische systemen, die het begrip van regionale ontwikkeling en regionale planning kunnen versterken en tevens inspiratie kunnen bieden voor strategieën voor regionale planning en ontwikkeling. Verschillende

concepten zijn verrijkt en getest met empirisch bewijs, waaronder: sociale innovatie, beheer van natuurlijke hulpbronnen, *green grabbing,* transformatieve sociale innovatie, *bottom-linked governance* en informele planningspraktijken. Verder is de relatie tussen sociale innovatie en regionale ontwikkeling - en de effecten tussen beide - bestudeerd aan de hand van verschillende situaties, zoals bestuur van beschermde gebieden, landbeheer, infrastructuur ontwikkelingsprojecten, sociaaleconomische ontwikkeling en toerisme. Dit onderzoek leverde tevens inzichten op om in twijfel te trekken of sociale innovatie daadwerkelijk een wondermiddel is om sociaal-ecologische uitdagingen en andere crises aan te pakken. In beleid wordt het vaak als zodanig aangeprezen. Het belangrijkste doel van dit proefschrift is dat het een analytisch kader biedt voor transformatieve sociale innovatie om te begrijpen en te onthullen hoe sociale innovatie bijdraagt aan systeemverandering. Dit raamwerk biedt niet alleen de kans om het potentieel en de beperkingen van sociale innovatie aan wetenschappers uit te leggen, maar kan ook als routekaart worden beschouwd voor planologen, beleidsmakers en sociale innovators om hun inspanningen te sturen met als doel regionale transformatie en verbetering van het welzijn te bereiken.

Door het onderzoek van de regio Huetar-Noord leverde dit promotieonderzoek empirisch bewijs over de werking van sociale-innovatieprocessen, bestuursmechanismen en planningsprocessen in de praktijk. Hiermee beïnvloedt sociale innovatie niet alleen de geschiedenis van een regio, maar stimuleert het bovendien mogelijke ontwikkelingstrajecten naar meer sociaal-ecologisch innovatieve regio's.

Executive summary

Scientists, practitioners, policy-makers, and communities widely express their concerns about environmental crises, social-economic vulnerabilities, and health threats. The pace of social and environmental change and the magnitude of impacts have led to a questioning of the standard practices of governance and spatial planning. If humanity intends to improve our wellbeing and that of the future generations, transformations in social relations, governance processes, and in the understanding of social-nature dependency will be necessary. Social innovation has become a term frequently promoted in government policy and in academic research as a way to encourage socio-economic enhancement and sustainable development. However, there is a need for better understanding social innovation as a proactive response within regions to address social and environmental challenges while influencing spatial planning practice and territorial governance processes, in theory and practice. Therefore, the main research question that structured this research was: *How can social innovation contribute to spatial transformation and sustainable regional development?*

In this thesis, a social-ecological systems (SES) lens was used to examine the concepts of regions, regional development, and adaptive capacity. An SES lens enables the exploration of the intertwined human-nature relations and their feedbacks. Several bodies of literature, including adaptive planning and governance, regional spatial planning, protected area governance, land use and resource management, institutions and institutional capacity, and resilience were combined with the social innovation literature to provoke cross-pollination in order to facilitate new insights. A set of research sub-questions were specifically considered: What can regional planning and social innovation learn from each other, in theory and practice, especially in the context of the governance of social-ecological systems? What opportunities and challenges do this ensemble of theories bring to regional development in analysis and practice? Does social-ecological systems theory adequately explain a dynamic and dialectic relationship between social innovation and regional spatial planning?

In sustainability and socio-environmental research, the boundary between the phenomenon and the context of study is often fuzzy. For this reason, in this investigation, case-study research methodology was used to empirically analyse social innovation as a proactive response within regions. This thesis examined how social innovation influences flexible governance processes of social-ecological systems, socio-spatial transformations, and regional sustainable development. It does so by exploring the Huetar-North region in Costa Rica. This exploration involved understanding the dynamics within and around the region as a whole, as well as, as they related to a specific protected area (the Juan Castro Blanco Water National Park), two social innovation initiatives (ADEZN and APANAJUCA), and several other local and national initiatives that were influenced by them (AFAMAAR, ZEE-Cartago, ADE-TJ, and ZEE-Osa). As case-study research, several

types of data, data sources, data gathering techniques, and methods for analysis were employed. The empirical research encompassed 87 interviews; participant observation in 13 meetings; attending, via personal invitation, at two congresses, one national and the other international; exploration and observation the context through five fieldtrips; and follow-up of the activities of the social innovation initiatives via social media content. Principles of social research ethics were observed throughout the investigation.

The exploration of the main research question provided three significant conclusions:

- *Social innovation has the potential to be transformative*. Transformation can be possible when social innovation initiatives advance beyond local processes and outcomes towards wider geographical scales and political levels. When this occurs, there could be significant impacts on the territory, governance systems, and even on people's attitudes. Social innovation does this by acting upon the greater good, scaling up and out, and developing a middle ground of governance where actors of varied sectors come together, namely, bottom-linked governance.

- *Social innovation is important in adaptive governance processes*. According to the findings of this research, social innovation fosters adaptive governance because social innovation enables the involvement of varied actors, and with them a diversity of values, interests and perspectives that provoke the trying-out of different methods of management. Of course, in this process some conflict may occur, but one of the conditions of successful social innovation is to be able to reconcile conflict amongst actors.

- *Social innovation facilitates more flexible, inclusive, and effective spatial planning*. The practice – and theory – of spatial planning is enhanced through the processes, actions and outcomes of social innovation. Spatial planning can progress and be more effective in an adaptive governance system because: the multi-level and multiscalar dynamics taking place in regions can be better understood; there are more spaces of collaboration involving non-traditional actors; and the institutional contexts have opportunity for renewal and change.

This research offered some significant insights for theory as well as for practice, especially within a context of governance of social-ecological systems that can enhance understanding of and inspire strategies for regional development and regional planning. Several key concepts were enriched and tested using empirical evidence, for example: social innovation, natural resource management, green grabbing, transformative social innovation, bottom-linked governance, and informal planning practice. Furthermore, the relationship and effects of social innovation in regional development were studied through varied situations, such as, protected area governance, land management, infrastructure development projects, socio-economic development, tourism, and others. This research also presented arguments to question the replication of social innovation as a panacea formula to attend to social-ecological challenges and crises elsewhere, a common recommendation that can be found in policy. Most significantly, with the intention of understanding and revealing how social innovation contributes to system

change, this thesis offers an analytical framework for transformative social innovation. This framework has the strength that is not only useful for scientists explaining social innovation potential and limitations, but also could be considered by planning practitioners, policy makers and social innovators as a roadmap to guide their efforts if regional transformation and wellbeing improvement are their ultimate goals.

By examining the Huetar-North region, this PhD research provided empirical evidence on how social innovation processes, governance mechanisms and planning practice actually 'play out in practice', shaping not only the history of a region, but furthermore, inspiring possible development pathways towards more socially-ecologically innovative regions.

Resumen ejecutivo

Las personas científicas, profesionales, políticas, y las comunidades locales, ampliamente expresan sus preocupaciones sobre las crisis ambientales, las vulnerabilidades socioeconómicas y las amenazas a la salud. El ritmo del cambio social y ambiental, y la magnitud de los impactos han llevado a cuestionar las prácticas comunes de gobernanza y planificación espacial. Si la humanidad se propone mejorar nuestro bienestar y el de las generaciones futuras, serán necesarias transformaciones en las relaciones sociales, en los procesos de gobernanza y en la comprensión de la dependencia que existe entre naturaleza y sociedad. La innovación social se ha convertido en un término que se promueve con frecuencia tanto en arenas políticas como académicas, como una forma de fomentar la mejora socioeconómica y el desarrollo sostenible. Sin embargo, existe la necesidad de comprender mejor la innovación social como una respuesta proactiva que surge desde de las regiones para abordar los desafíos sociales y ambientales; al tiempo que, la innovación social, influye en la práctica de planificación espacial y los procesos de gobernanza territorial, en la teoría y la práctica. Por lo tanto, la pregunta principal de investigación que estructuró esta investigación fue: *¿Cómo la innovación social puede contribuir a la transformación espacial y al desarrollo regional sostenible?*

En esta tesis, se utilizó como lente meta-teórico a la teoría de los sistemas sociales-ecológicos (SES) para examinar los conceptos de región, desarrollo regional y capacidad de adaptación. Una lente SES permite la exploración de las relaciones entrelazadas entre humanos y naturaleza, así como de sus retroalimentaciones. Varios cuerpos de literatura, incluidas planificación y gobernanza adaptativas, planificación regional espacial, gobernanza de áreas protegidas, uso de la tierra y la gestión de recursos, instituciones y capacidad institucional, y resiliencia, se combinaron con la literatura sobre innovación social para provocar una polinización cruzada, a fin de facilitar nuevos conocimientos. . Se consideró específicamente un conjunto de sub-preguntas de investigación: ¿Qué pueden aprender la planificación regional y la innovación social entre sí, en la teoría y la práctica, especialmente en el contexto de la gobernanza de los sistemas sociales-ecológicos? ¿Qué oportunidades y desafíos trae este conjunto de teorías al desarrollo regional en el análisis y la práctica? ¿Puede la teoría de los sistemas sociales-ecológicos explicar adecuadamente una relación dinámica y dialéctica entre la innovación social y la planificación regional espacial?

En investigaciones socio-ambientales y sobre sustentabilidad, el límite entre el fenómeno y el contexto de estudio es a menudo confuso. Por esta razón, en esta investigación se utilizó la metodología de investigación de caso de estudio para analizar empíricamente la innovación social como una respuesta proactiva dentro de las regiones. Esta tesis examinó cómo la innovación social influye en los procesos de gobernanza flexible de los sistemas sociales-ecológicos, las transformaciones socioespaciales y el desarrollo sostenible regional. Lo hace explorando la región Huetar-Norte de Costa Rica. Esta exploración

involucró la comprensión de las dinámicas dentro y alrededor de la región en su conjunto, así como, en relación con un área protegida específica (el Parque Nacional del Agua Juan Castro Blanco), dos iniciativas de innovación social (ADEZN y APANAJUCA), y varias otros iniciativas locales y nacionales que fueron influenciadas por ellos (AFAMAAR, ZEE-Cartago, ADE-TJ y ZEE-Osa). Como es costumbre en la investigación de caso de estudio, se emplearon varios tipos de datos, fuentes de datos, técnicas de recopilación de datos y métodos de análisis. La investigación empírica abarcó 87 entrevistas; observación participante en 13 reuniones; asistencia, por invitación personal, a dos congresos, uno nacional y otro internacional; exploración y observación del contexto a través de cinco salidas de campo; y seguimiento de las actividades de las iniciativas de innovación social a través de contenidos en redes sociales. A lo largo de la investigación se observaron los principios de la ética de la investigación social.

La exploración de la pregunta principal de investigación arrojó tres conclusiones significativas:

- *La innovación social tiene el potencial de ser transformadora*. Transformación puede ser posible cuando las iniciativas de innovación social avanzan más allá de los procesos y resultados locales hacia escalas geográficas y niveles políticos más amplios. Cuando esto ocurre, pueden haber impactos significativos en el territorio, los sistemas de gobernanza, e incluso, en las actitudes de las personas. La innovación social hace esto al actuar en pro del bien mayor, escalando hacia arriba y hacia afuera, y desarrollando un término medio de gobernanza donde los actores de diversos sectores se unen, a saber, la gobernanza vinculada desde la base.

- *La innovación social es importante en los procesos de gobernanza adaptativa*. De acuerdo con los hallazgos de esta investigación, la innovación social fomenta la gobernanza adaptativa porque la innovación social permite la participación de actores variados, y con ellos una diversidad de valores, intereses y perspectivas que provocan la experimentación de diferentes métodos de gestión. Por supuesto, en este proceso puede ocurrir algún conflicto, pero una de las condiciones de una innovación social exitosa es poder reconciliar el conflicto entre los actores.

- *La innovación social facilita una planificación espacial más flexible, inclusiva y eficaz.* La práctica, y la teoría, de la planificación espacial se mejoran a través de los procesos, acciones y resultados de la innovación social. La planificación espacial puede progresar y ser más efectiva en un sistema de gobernanza adaptativo porque: la dinámica multinivel y multiescalar que tiene lugar en las regiones se puede comprender mejor; hay más espacios de colaboración que involucran a actores no tradicionales; y los contextos institucionales tienen oportunidad de renovación y cambio.

Esta investigación ofreció algunas ideas significativas tanto para la teoría como para la práctica, especialmente en un contexto de gobernanza de los sistemas sociales-ecológicos, que pueden mejorar la comprensión e inspirar estrategias para el desarrollo regional y la planificación regional. Varios conceptos clave se enriquecieron y se probaron utilizando evidencia empírica, por ejemplo: innovación social, gestión de recursos naturales, acaparamiento verde, innovación social transformadora, gobernanza vinculada desde la base, y práctica de planificación informal. Además, se estudiaron la relación y los efectos de la innovación social en el desarrollo regional a través de diversas situaciones, como la gobernanza de áreas protegidas, la gestión del territorio, los proyectos de desarrollo de infraestructura, el desarrollo socioeconómico, el turismo y otros. Esta investigación también presentó argumentos para cuestionar la replicación de la innovación social como una fórmula panacea para atender los desafíos y crisis socio-ecológicas en otros lugares, una recomendación que se puede encontrar comúnmente en la política. Más significativamente, con la intención de comprender y revelar cómo la innovación social contribuye al cambio en el sistema, esta tesis ofrece un marco analítico para la innovación social transformadora. Este marco tiene la fuerza de que no solo es útil para los científicos que intentan explicar el potencial y las limitaciones de la innovación social, sino que también podría ser considerado por profesionales de la planificación, formuladores de políticas públicas, e innovadores sociales como una hoja de ruta para guiar sus esfuerzos; eso en tanto, la transformación regional y la mejora del bienestar sean sus objetivos finales.

Al examinar la región Huetar-Norte, esta investigación de doctorado proporcionó evidencia empírica sobre cómo los procesos de innovación social, los mecanismos de gobernanza y la práctica de planificación en realidad 'se desenvuelven en la práctica', dando forma no solo a la historia de una región, sino además, inspirando posibles vías de desarrollo hacia regiones más social y ecológicamente innovadoras.