



Social capital in post-disaster recovery trajectories: Insights from a longitudinal study of tsunami-impacted small-scale fisher organizations in Chile



Andrés Marín^{a,b,*}, Örjan Bodin^a, Stefan Gelcich^c, Beatrice Crona^{a,d}

^a Stockholm Resilience Centre, Stockholm University, Stockholm, Sweden

^b Centro de Estudios del Desarrollo Local y Regional, Universidad de Los Lagos, Osorno, Chile

^c Departamento de Ecología, Center of Applied Ecology and Sustainability (CAPES) and Centro de Conservación Marina, Pontificia Universidad Católica de Chile, Santiago, Chile

^d Global Economic Dynamics and the Biosphere, Royal Swedish Academy of Sciences, Stockholm, Sweden

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ABSTRACT

Increased likelihood and severity of coastal disasters in the 21st century represent major threats for coastal communities' resource management capacity and livelihoods. Disaster research has frequently looked for singular factors explaining why some communities are more resilient and better equipped to cope with and recover from disasters. This study draws on Chile's 2010 tsunami to evaluate the effects of both internal (social capital) and external (level of damage and isolation) factors on fishing communities' recovery trajectories. Using qualitative comparative analysis (QCA) we assess how the concurrency of conditions explains fisher organization responses. By operationalizing social capital as the social networks developed for co-management, we also evaluate whether social capital developed for natural resource management can help communities overcome post-disaster challenges. Results show that the level of linking social capital is critical in determining post-disaster trajectories. While maintained or increasing levels of social capital are indispensable for positive trajectories to occur, a common denominator for less desirable post-disaster recovery trajectories is a low or reduced level of social capital. However, external factors, such as the amount of damage and geographical isolation, are also important in determining recovery trajectories, indicating the limits of relying solely on social relations for recovery. These concurrent factors can amplify or reduce the importance of supportive relationships. Understanding the implications of complex interplay between social capital and external factors for community recovery in response to coastal disasters can inform the design of more effective and efficient responses and policies in Chile and more broadly. Furthermore, social capital developed for the purpose of co-management of natural resources can actually promote desirable post-disaster trajectories.

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1. Introduction

More frequent and severe disasters are forecasted for the 21st century due to climate and other global environmental changes. These are likely to have greater impacts on coastal zones and dramatic consequences for fishing households and communities (Adger et al., 2005; Costanza and Farley, 2007; Smith, 2013). Poverty and high dependence on diminishing natural resources imply low abilities to recover, which make small-scale fishing communities one of the most vulnerable groups to coastal

disasters and perturbations (Pomeroy et al., 2006). In the last decade, for instance, tsunamis in South Asia, Chile and Japan have devastated entire communities, port infrastructure, fishing fleets and coastal ecosystems, threatening the livelihoods of millions of people (Miller et al., 2006; Marín et al., 2010; Palermo et al., 2013; Mimura et al., 2011). In general, fisheries and local communities recover from catastrophic events in the long-term, but show uneven capacities to respond. While some groups are able to react quickly and adapt to the new conditions, many have a hard time trying to normalize their lives and risk losing their livelihoods or moving towards unsustainable practices such as overfishing (Pomeroy et al., 2006; Santha, 2014). Understanding what makes a difference for fishing communities in the aftermath of coastal disasters can therefore inform the design of more equitable and sustainable livelihood recovery strategies.

* Corresponding author at: Stockholm Resilience Centre – Stockholm University, Kräftriket 2B, Stockholm SE-10691, Sweden.

E-mail address: andres.marin.r@gmail.com (A. Marín).

What makes communities better or worse prepared to respond and recover from extreme perturbations? Disaster research has largely drawn on resilience and vulnerability concepts to address this question (Manyena, 2006). Resilience refers broadly to the capacity of systems to absorb recurrent disturbances so as to retain essential structures, processes, identity and feedbacks (Walker et al., 2004; Adger et al., 2005). Disaster resilience, in particular, has been defined as “the ability to prepare and plan for, absorb, recover from, or more successfully adapt to actual or potential adverse events” (National Research Council, 2012, p. 16). In the face of a disaster, the resilience approach focuses on the *internal* or intrinsic factors of systems that lead to more or less capacity to respond to risks and adapt to change. Vulnerability, by contrast, reflects the level of exposure to risk. It has been defined as “the state of susceptibility to harm from exposure to stresses associated with environmental and social change” (Adger, 2006, p. 1). Vulnerability also has been associated with the circumstances of a person or group that determine their ability to withstand and recover from the impact of perturbations (Blaikie et al., 2004; Adger, 2006). Disaster vulnerability reflects the likelihood to be damaged, which varies in time and space, and among different social groups (Cutter et al., 2003). Unlike the resilience concept, the vulnerability approach highlights *external* or contextual factors that determine the exposure of a system to disasters and its possibilities to respond and recover.

Despite their differences, resilience and vulnerability are complementary concepts. Integrative approaches to the study of disasters attempt to understand how internal and external factors simultaneously determine processes and outcomes after a major shock (Berkes, 2007; Turner, 2010; Maru et al., 2014; Cutter et al., 2014). In this study of the Chilean 2010 tsunami and its impacts on the small-scale fishery in the BioBio region (Fig. 1), we adapt this integrative approach to explore the interplay between internal factors related to resilience (social capital; hereon SC) and external factors related to vulnerability (extent of the damage and geographic isolation) in affecting fisher organizations’ post-disaster recovery trajectories.

SC broadly captures a group or an individual’s ability to act and make use of various types of resources through the existence of social relations, shared norms and mutual trust (Coleman, 1988; Krishna, 2002), and has been regarded by some as a key determinant of disaster recovery highly dependent on actors’ capacities (Munasinghe, 2007; Aldrich, 2010, 2011a). In the aftermath of disasters, the underlying networks between and among individuals, groups and organizations are believed to channel crucial resources and information that facilitate collective action and more prompt and sustainable recovery (Nakagawa and Shaw, 2004; Aldrich, 2012a,b). Other authors have claimed that recovery is determined by external factors beyond the control of impacted communities, such as the extent of damage suffered and the level of isolation, which (Haas et al., 1977; Régnier et al., 2008). So far, studies have analyzed the individual effect of internal and external factors on disaster recovery, but few have explored whether these effects are contingent to another. Yet better understanding of current problems in social-ecological systems greatly demands that we (re) think about complex causal pathways and the toolbox of methods and approaches used (Young et al., 2006). Consideration of concurrent and interacting rather than single factors can have important implications for more effective resource allocation and post-disaster recovery policies.

In this study we investigate if and how SC – in combination with the levels of damage and geographic isolation – determines fishing organizations’ ability to recover and innovate in response to a tsunami disaster. We hypothesize that this capacity is fundamental to post-disaster recovery and, in combination with other internal and external factors, will be critical in determining community

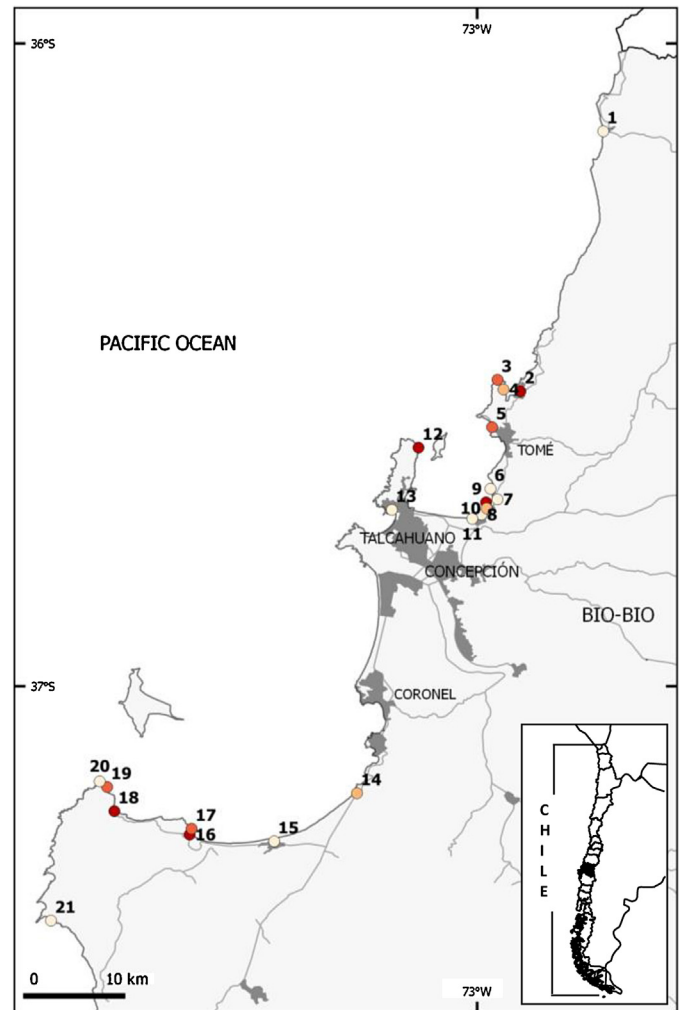


Fig. 1. Area of study and referential location of the 21 fisher organizations (FO; their names are omitted for confidentiality); colors express the level of damage (i.e., darker colors = higher damage); grey patches show urban areas; lines stand for main highways.

resilience and vulnerability (Pelling and High, 2005). The research draws on semi-structured and in-depth interviews with the leaders of fisher organizations and fishery authorities carried out before and after the 2010 Chilean earthquake and tsunami. In the following sections we first discuss what post-disaster recovery implies in the context of resource-based communities and the potential factors behind it; second, we introduce Chile’s small-scale fisheries and the coastal disaster that struck the country in 2010; third, we describe the data collection process and the tools employed, the operationalization of the outcome and explanatory variables, and our approach to data analyses. We then present and discuss our findings and limitations of the research.

1.1. Post-disaster recovery trajectories: bouncing back and beyond

Disasters can suddenly affect the livelihoods of small-scale natural resource users (Marín et al., 2014). Not only can they alter ecosystems on which people rely, but they can also destroy infrastructure and technology used to exploit and manage those ecosystems. A common expectation after a disaster is to rebuild, recover, or return to the normal (Leitch and Bohensky, 2014). In the literature, this notion is normally referred to as the capacity of a system to “bounce back” to a previous state (Manyena, 2006).

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