



Research

Forces opposing sustainability transformations: institutionalization of ecosystem-based approaches to fisheries management

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ABSTRACT. Moving toward new ways of governing ecosystems in varied contexts worldwide is likely to be a critical part of achieving the global Sustainable Development Goals, yet understanding of the tensions between forces driving and opposing such sustainability transformations is very limited. Here, I shed light on this critical research and policy domain by applying participatory actor and influence mapping (Net-Map) and innovation histories methods to understand the power relations and social processes involved in enabling and blocking the institutionalization of an ecosystem approach to fisheries management (EAFM) in the Philippines. Drawing upon a case study of an intermunicipal alliance in Lanuza Bay, the results highlight how challenges such as vested and divergent interests, corruption, weak coordination between levels of government, and the particular contingencies of place conspire to weaken and undermine initial EAFM successes. I conclude that agents of resistance, the role of power and agency, and socio-political realities need to be central to resilience conceptualizations of sustainability transformations.

Key Words: *institutionalization; power and politics; small-scale fisheries; transformations*

INTRODUCTION

Mounting evidence shows that current human development is causing large-scale changes to ecosystems worldwide and undermining the vital services they provide humanity (Millennium Ecosystem Assessment 2005, UNEP 2007, IPCC 2014). At the same time, a large proportion of the world's population remains trapped in conditions of income poverty, ill-health, and malnutrition (Raworth 2012, Leach et al. 2013). Humanity has set itself an unprecedented challenge of ensuring that the planet remains within ecological boundaries that are suitable for humans to thrive while also improving global equity and the well-being of all the Earth's citizens, embodied in the 2015 Sustainable Development Goals (United Nations 2015). There is growing recognition that radical socio-cultural, institutional, political, and technological changes are required to meet these societal goals. Thus, sustainability transformation, or how to transform deliberately from unsustainable development pathways, at local to global scales, toward more sustainable ones, is emerging as a critical research domain (Kates et al. 2001, Folke et al. 2005, Chapin et al. 2011, O'Brien 2012).

The state of marine ecosystems and fisheries is emblematic of the global sustainability challenge. With rampant marine ecosystem degradation, high dependence on overexploited and dwindling marine resources, and entrenched poverty, there is an urgent need for transformations toward more sustainable development trajectories (McManus 1997, Burke et al. 2011, Abernethy et al. 2014). This change will require new ways of governing natural resources, such as the ecosystem approach to fisheries management (EAFM), which is a widely advocated approach to managing the entire ecosystem that supports fisheries and their interactions with humans, and addresses multiple drivers of change (McLeod et al. 2005, UNEP 2011). Understanding how to shift governance systems toward ecosystem approaches is likely to be critical for making fisheries sustainable.

Several empirical studies have identified factors that enable governance transformations (e.g., Olsson et al. 2004, 2008, Biggs et al. 2010, Gelcich et al. 2010), but very little is mentioned about what blocks new governance arrangements from being sustained, mainstreamed, and embedded, or in other words, institutionalized. However, cultural norms, set world views and attitudes, rigid social institutions, and vested interests can make change from the status quo very challenging indeed (Pierson 2000, Gunderson and Holling 2002, Pelling 2010, Geels 2011).

My aim here is to highlight the tension between forces driving and opposing transformations through an empirical study of the initiation and implementation of EAFM in the Philippines. EAFM there required the rescaling of fisheries management from national and local levels to multilevel polycentric governance at a large ecosystem scale. This rescaling, if successful, implies transformative changes to institutions, social networks, the distribution of power, the types of knowledge employed, and human behavior.

To begin, I review the existing resilience literature on the enablers of and barriers to governance and sustainability transformations. Second, I introduce the concept of EAFM and my case study of an intermunicipal alliance in Lanuza Bay, Philippines, that is working toward EAFM. Third, I outline the participatory methods used to capture the process of, and social relations involved in, institutionalizing the alliance. Fourth, I present the observed events and strategies of actors and the contextual factors driving and opposing the alliance's institutionalization. Finally, I discuss how weak cross-scale institutional support, socio-political culture, and entrenched power relations engender resistance to new institutional arrangements. I suggest that this finding has profound implications for not only the conceptualization and practice of EAFM, but also the way we theorize, analyze, and put to work resilience theory on sustainability transformations at multiple scales and across diverse contexts.

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THEORY AND BACKGROUND

A social-ecological resilience perspective on transformation

Social-ecological systems continuously change in response to external drivers of change and internal dynamics (Carpenter and Gunderson 2001, Holling 2001). When these changes are radical, such as when new variables are introduced and others lost, ecological and social thresholds can be crossed, and the system undergoes a transformation (Gunderson and Holling 2002, Walker et al. 2004, Chapin et al. 2010). The crossing of thresholds can be forced by internal dynamics and external drivers of change, such as a coral reef dominated ecosystem shifting to an algae-dominated ecosystem, or be deliberately initiated by societies in recognition that the current system trajectory is untenable, such as planned resettlement in response to sea-level rise (Walker et al. 2004, Nelson et al. 2007). Although some confusion remains, a deliberate transformation is generally thought to entail major shifts in societal regimes, including reconfigurations of social networks; implementation of institutional reforms; shifts in underlying norms, values, perceptions, and meanings; changes in practices; implementation of new management paradigms; cultural changes; production of new forms of knowledge; and redistributions of power (Folke et al. 2010, Pelling 2010, Field et al. 2012, O'Brien 2012). Governance change is therefore inherently a critical part of transformation toward sustainability (Patterson et al. 2017).

Moore et al. (2014), building on the work of Olsson et al. (2004, 2006), identify phases to a deliberate transformation, including trigger events, actors preparing for and navigating a transition, and, finally, institutionalizing a new system trajectory. Empirical studies of transformations have explored shifts in governance toward ecosystem management of, for example, a wetland landscape in Kristianstad, Sweden (Olsson et al. 2004), the Great Barrier Reef, Australia (Olsson et al. 2008), Chilean coastal fisheries (Gelcich et al. 2010), the Sabie River Basin, South Africa (Biggs et al. 2010), the Coral Triangle region, western Pacific Ocean (Rosen and Olsson 2013), and small-scale fisheries in Cau Hai Lagoon, Vietnam (Andrachuk et al. 2018). These studies have provided important insights into the character of transformations, the drivers of change, and the strategies and capacities of individuals and informal networks involved in the trigger, preparatory, and transition phases of a transformation. However, there has been little empirical work on the institutionalizing phase, including the factors blocking institutionalization. This phase refers to the strengthening of new dominant system feedbacks by actors routinizing new practices (Moore et al. 2014). This process may involve dedicating funds and personnel to a new activity or changing the regulatory framework so that the new trajectory continues beyond the informal network that initiated the change. The process is critical for embedding and diffusing new norms, values, and practices so that new governance regimes persist beyond their initiation. The lack of attention to the institutionalization phase may be due to important social processes remaining hidden during the limited temporal observation window of existing studies. However, institutionalization is potentially the most challenging of the phases because there is likely to be resistance from those who stand to lose from any change to the status quo, and because of critical barriers to routinizing new practices, such as the challenges of maintaining the enthusiasm of participants and the relatively high levels of

financial and human resources needed to support transitions in ecosystem governance. Analyzing the institutionalization phase can help to fill the current knowledge gap on the social and political factors that hinder transformations toward sustainability (Görg et al. 2017).

Barriers to institutionalizing a transformation

Resilience theory has captured how undesirable social-ecological system states can become trapped and resistant to change. Social-ecological traps are “situations when feedbacks between social and ecological systems lead towards an undesirable state that may be difficult or impossible to reverse” (Cinner 2011:835). Adaptation and transformation can also be inhibited by “rigidity traps”, whereby actors and institutions persevere with the current governance system and reject change despite acknowledging that change is necessary (Gunderson and Holling 2002). Actors are thus locked into a particular trajectory and are unable to respond to new challenges and opportunities (Olsson et al. 2010). The system has reinforcing feedback mechanisms, which means an action or event pushes a system further along a pathway, in other words, it is path dependent (Pierson 2000). For example, despite continued declines in fish stocks, subsidies continue to be provided to the fishing industry to maintain catch levels, incomes, and identities, which encourages further overexploitation and resource decline (Pauly et al. 2005).

The notion of traps can inform a study of barriers to institutionalizing transformations, but this theory is incomplete and lacks empirical investigations of how culture, set world views and attitudes, established power dynamics, politics, and institutional rigidity synergize to make shifting to a new pathway difficult (Gelcich et al. 2010, Pelling 2010). In a rare empirical example from the resilience literature, Schlüter and Herrfahrtd-Pähle (2011) show the importance of historic and political contexts for inhibiting transformability in the Amudarya River basin, central Asia, despite the failures of the current governance regime being made apparent by a major environmental crisis. When considering transformative change, issues of power and politics become especially pertinent (O'Brien 2012). Because transformation involves, among other things, radical shifts in technologies, institutions, culture, and values, it requires change from the status quo, which creates winners and losers and is likely to affect the interests of powerful actors that benefit from the existing system state (Pelling 2010). Entrenched power relationships such as vested interests reinforce feedbacks in the existing system trajectory. A consideration of power relations and politics is therefore critical for understanding barriers to change and whether a new governance regime can be institutionalized in the face of continued resistance (Leach et al. 2010), yet current sustainability discourse frames transformation as apolitical (Blythe et al. 2018).

In sum, there is a need for empirical research on the social processes that enable and block the institutionalization of transformations. By analyzing a shift toward EAFM in the Philippines, I seek to develop a stronger foundation for theory and policy formulation on sustainability transformations.

Ecosystem approach to fisheries management

Ecosystem-based management is “an integrated approach to management that considers the entire ecosystem, including humans”, which requires the cumulative influences of multiple

sectors on ecosystems to be managed (McLeod et al. 2005:1). When ecosystem-based management is applied to the fisheries sector, it is known as EAFM (FAO 2003) or ecosystem-based fisheries management (e.g., Pikitch et al. 2004). The primary aim of EAFM is to sustain marine ecosystems to enhance the fisheries they support. Goals can include halting or minimizing degradation of ecosystems, reducing excessive discard and mortality of nontarget or undersized fish species (i.e., bycatch), and managing target fish species by understanding links with other ecosystem components, e.g., their habitat and relations with nontarget species (Pikitch et al. 2004). EAFM embraces a number of principles that imply significant changes to how fisheries and ecosystems are governed (Table 1). EAFM therefore offers a relevant example through which to study the social processes involved in a governance transformation with the potential to improve the sustainability of fisheries systems.

Table 1. Governance changes implied by selected principles of ecosystem-based fisheries management and ecosystem approach to fisheries management. Adapted from Staples et al. (2014).

Principle	Governance change
Appropriate scale	Shift from management by political or administrative jurisdiction to better align with multiple ecological, socioeconomic, and temporal scales
Increased participation	Stakeholders become a central part of the management process, meaning that power is redistributed, typically away from government to communities of resource users; stakeholder participation also implies accounting for both indigenous and scientific knowledge
Institutional cooperation and coordination	New coordinating institutions and the reconfiguration of social networks are normally required to ensure coordination among management levels, sectors, and jurisdictions

Building upon a legacy of community-based marine protected areas (Alcala and Russ 2006), the Philippines is home to some of the first attempts to implement ecosystem-based management in the tropics (Aswani et al. 2012). Because EAFM seeks to match the scale of fisheries governance with the supporting ecosystem, it often requires coordination among institutions established along the lines of administrative and political jurisdictions. In the decentralized governance context of the Philippines, management of coastal resources is the responsibility of municipal governments out to 15 km offshore. To manage resources at an ecosystem scale, such as bays, estuaries, or contiguous resources, municipal governments have formed alliances to manage their shared waters using ecosystem approaches and tools such as “ridge to reef” management, marine protected area (MPA) networks, and enforcing bans on destructive fishing practices (Pomeroy et al. 2010). Horigue et al. (2012) identified 40 alliances in the Philippines, comprising 270 cities and municipalities, and 484 MPAs. However, only one-quarter of the established alliances are known to still be active, begging the question: Why is it so difficult to institutionalize EAFM in this context?

METHODS

Case study: Lanuza Bay Development Alliance

Lanuza Bay is located on the Pacific coast of the island of Mindanao in the southeast of the Philippines (Fig. 1). It is situated

within the Province of Surigao del Sur in the region of Caraga and is shared by five coastal municipalities: Carrascal, Cantilan, Madrid, Lanuza, and Cortes. Coastal ecosystems include extensive mudflats, seagrass beds, coral reefs, and mangroves. It has a mainly rural economy, with 70% of the population dependent on farming and fishing.

Fig. 1. Map of the Philippines showing the Lanuza Bay Development Alliance focus area (Surigao del Sur, Philippines). Star shows the location of the study area within the Philippines. Source: reproduced from FISH Project (2010a) by Jennifer McWhorter.



Beginning in the early 2000s, in response to concerns over declining fish catches, community-based and collaborative fisheries management became coordinated at the scale of the entire Lanuza Bay ecosystem, a network of MPAs was established to protect critical habitats, and enforcement of legislation banning destructive fishing gear was strengthened. These ecosystem approaches are implemented through the Lanuza Bay Development Alliance (LBDA), comprising the five riparian municipalities, plus the neighboring municipalities of Tandag and Carmen because their citizens either fish or consume fish caught in the bay (Fig. 1). Thus, the case provides an example of fisheries management moving toward an ecosystem-based approach (also see Table 2).

Data collection and analysis

The study employed two participatory methods to explore the process of governance change at multiple levels and the network of social relations among actors influencing the emergence and institutionalization of EAFM in Lanuza Bay. The participatory methods recorded the lived experience of actors involved in, influencing, or being influenced by the shift toward EAFM and facilitated reflection and learning among participants to support the future improvement of marine governance in Lanuza Bay.

The “innovation histories” method, developed by Douthwaite and Ashby (2005), is a technique for recording and learning from the development and adoption of past innovations. I adapted the method to record the history of the evolution of fisheries management leading up to, and following, the LBDA’s establishment in 2004 until 2015. The method involved: (1) a workshop with stakeholders that participate in fisheries

Table 2. New fisheries management institutions in Lanuza Bay, Philippines. LBDA = Lanuza Bay Development Alliance, LGU = local government unit, MPA = marine protected area.

New formal institution	Description	Significance
LBDA Covenant (LBDA 2008)	Seven member LGUs are signatories to the covenant, which stipulates the organizational structure and guiding principles of the LBDA	Fisheries of Lanuza Bay should be governed by ecosystem approaches and not by political divisions
LBDA Council, Project Office, and Executive Director	LBDA Council is the decision-making body; the Executive Director and Project Office are responsible for coordinating municipal legislation, enforcement, and fisheries management programs across the bay	Coordination of municipal-level activities at the scale of the bay
Unified Fisheries Ordinance (LBDA 2004)	A harmonized legal framework for the alliance waters, aligned with the Fisheries Code (1998)	Common legal framework governing the fisheries of the bay
Comprehensive Fishery and Aquatic Resources Management ordinances	A set of shared rules for the fisheries of Lanuza Bay embodied in a legislative template, which was enacted in each member LGU with some adaptations	Similar legal framework for each municipality in the alliance
Namanaka (<i>Nagkahiusang Mananagat na Nag-amping sa Kadagatan</i>)	An association of chairpersons of each people's organization responsible for management of individual MPAs	Social network of MPAs created

management in Lanuza Bay; and (2) semistructured interviews with stakeholders past and present. Participants cocreated timelines by identifying key events such as critical decisions made; important meetings, actions, and activities; changes in relationships between actors; something new learned; problems and challenges; and unexpected events such as a typhoon event (adapted from Abernethy et al. 2014). Participants then identified and discussed the most important events on the timeline. During semistructured interviews, events identified at the workshop were discussed in depth by the same participants, allowing them to voice perspectives that they may have felt uncomfortable providing in a public forum. Interviews were also held with stakeholders involved in earlier phases of the history (e.g., retired personnel) and those unable to attend the workshop. Overall reflective questions were also asked about the timeline to investigate emerging themes, including key actors (leadership and agency), resistance, and overall constraints and challenges.

The LBDA comprises a diverse range of stakeholders (Fig. 2). To analyze the complex relationships among them, I adopted Net-Map, a participatory social network mapping tool that “helps people understand, visualize, discuss, and improve situations in which many actors influence outcomes” (Schiffer 2007:3). The Net-Map toolbox provides a process for mapping power relationships and understanding the differential influence of actors on a policy domain (Schiffer and Hauck 2010). By capturing the perceived influence of actors within a social network, I sought to reveal power relations and how they affected the ability of actors to enable, shape, and inhibit the emergence and institutionalization of EAFM in Lanuza Bay. Conducting Net-Map in interviews, as opposed to a focus group, ensured that participants could speak freely about politically sensitive relationships, issues, and barriers.

The workshop facilitation team included myself, an external facilitator native to the Philippines, and, to increase its ownership of workshop outcomes, LBDA staff. Each member of the team was trained in the method and guided a group of stakeholders to develop their innovation history. Net-Map and innovation history interviews were conducted in the regional language of Cebuano by a translator, who translated responses into English in situ and

Fig. 2. Key actors involved in an ecosystem approach to fisheries management in Lanuza Bay (Fortnam 2017). BFAR = Bureau of Fisheries and Aquatic Resources, CRMC = municipal Coastal Resource Management Coordinator, DENR = Department of Environment and Natural Resources, LBDA = Lanuza Bay Development Alliance, MEAT = Municipal Enforcement Action Team, MFARMC = Municipal Fisheries and Aquatic Resource Management Council, NGO = nongovernmental organization, PFARO = Provincial Fisheries and Aquatic Resources Office, PNP = Philippines National Police, PO = people's organization.

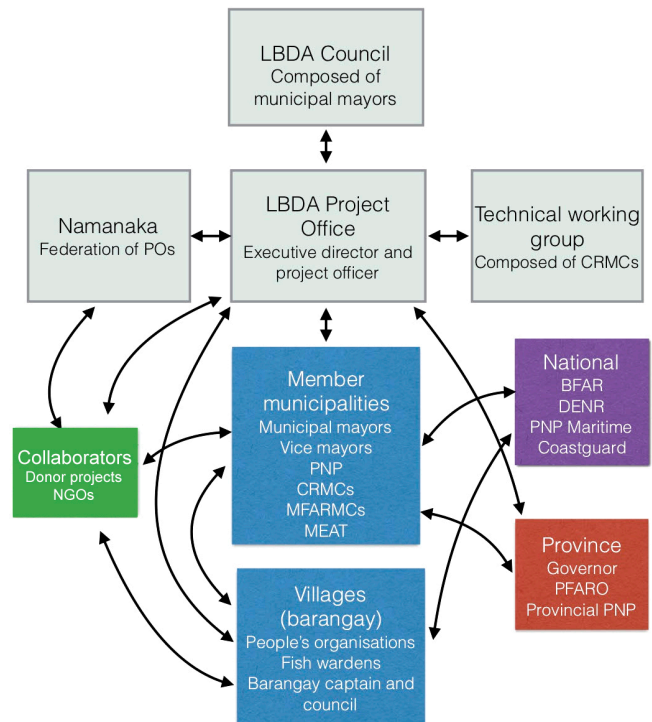
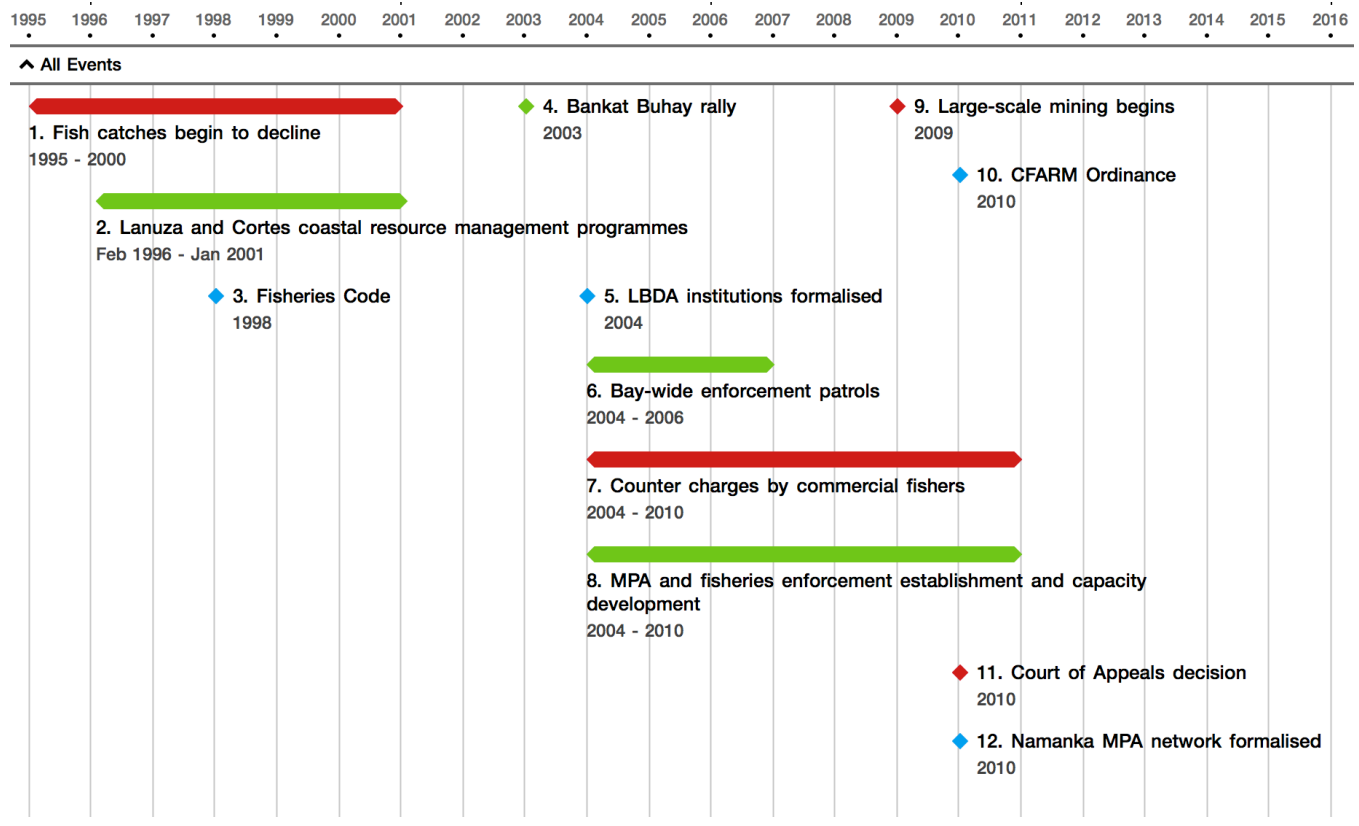


Fig. 3. Key events in the innovation history of Lanuza Bay Development Alliance (LBDA). Red = problems or challenges, blue = institutional developments, green = actions and activities.



later transcribed the digitally recorded interview. To analyze the innovation history data, a two-column learning history report conveyed quotations and paraphrases about key events in one column and researcher reflections in a second column to provide a wider perspective, make implicit meaning explicit, and provide additional information (see Douthwaite and Ashby 2005). Net-Map interview transcripts were coded and thematically analyzed using NVivo software. This analysis revealed perceptions of the roles and influence of actors, problematic relations and other network challenges, and the dynamics of relationships in relation to the innovation history.

RESULTS

The first part of the results is organized chronologically as much as possible to present the history of the emergence and development of the LBDA and the evolution of forces driving and opposing its institutionalization. The data revealed both agents of change and agents of resistance, as well as factors and strategies that facilitated and hindered the implementation and sustainment of EAFM. The second part of the results explores the influence of the institutional, economic, and socio-political contexts on this process. The results expose the tension between driving and opposing forces for institutionalizing transformations. However, more detail is presented on the opposing forces than the driving forces because the former have received little analysis to date.

History of Lanuza Bay Development Alliance development and resistance

Here, I present the analysis of the history of the LBDA, as shown in the timeline of key events (Fig. 3).

Emergence of LBDA

In the 1980s and 1990s, destructive fishing was rampant in Lanuza Bay. Small-scale fishers used dynamite and noxious substances such as cyanide that destroyed or degraded coral reefs, and fine mesh nets (e.g., beach seine) that indiscriminately caught juvenile fish and degraded nearshore habitats. Commercial fishing techniques, especially Danish seine (known locally as *liba-liba*), reportedly caught unsustainable volumes of fish and damaged marine habitats. During this period, fishers recalled that fisheries were abundant and catches were plentiful; few questioned the unsustainable practices employed because the link between habitat degradation and fisheries production was not recognized, and existing fisheries rules were not enforced.

Two events triggered change. First, the Local Government Code (1991) and a new national fisheries law, the Fisheries Code (1998), devolved responsibility for fisheries management out to 15 km offshore to local government units (LGUs) comprising municipal and village governments, and reserved these waters for small-scale fisheries (vessels < 3 gross tons). It also gave LGUs the right to cluster into alliances to manage contiguous coastal resources that straddle several municipalities.

Second, fishers noticed their catches were declining. In response, a newly elected mayor of Lanuza, Dr. Jerry Irizari, initiated a municipal coastal management program, *Sagip Karagatan* (1996–1999), which included the mobilization of community-based fisher organizations, known as people’s organizations, to support fisheries enforcement and the establishment of a 300-ha no-take MPA. In the neighboring municipality of Cortes, pioneering coastal resource management activities also began, including the establishment of two small fish sanctuaries and strengthened fisheries enforcement. However, by 2000, Mayor Irizari realized that management at the municipal level did not match the scale of the problem. The different regulatory and enforcement regimes across Lanuza Bay meant that small-scale and commercial vessels could escape apprehension by moving across jurisdictions. Between 1998 and 2004, with the support of a regional nongovernmental organization (NGO), intermunicipal discussions were held on shared fisheries concerns. NGOs and donor-funded projects also ran education campaigns to build awareness of the threat of unsustainable fishing practices, which culminated in an organized public rally called *Bankat Buhay* (“our boat is our life”) in 2003. The following year, the mayors of all the municipalities in the bay formed the LBDA.

Implementing and institutionalizing an ecosystem approach to fisheries management

Attracted by the proactivity of politicians and fishers in the bay, foreign aid agencies introduced ecosystem-based approaches and provided technical assistance and resources for the development of new institutional arrangements for bay-wide management (Table 2).

A similar institutional framework therefore governed fishing activity across Lanuza Bay, but decision-making authority remained at the municipal level with the LBDA council and project office serving as coordinating bodies (Fig. 2). As such, EAFM in Lanuza Bay could be described as a polycentric governance system with several semiautonomous decision-making units and vertical and horizontal coordinating institutions (Ostrom 2010).

A network of 17 new or strengthened no-take MPAs, known as fish sanctuaries, was established, and municipal fisheries enforcement capacity was developed with support from the U.S. Agency for International Development Fisheries for Improved Sustainable Harvest (FISH) Project (2004–2010). The MPAs were networked socially through Namanka, an association of chairs of people’s organizations, which managed the individual MPA (Table 2). From 2004 until 2006, a bay-wide enforcement action team patrolled the shared waters of the member municipalities, enforcing fisheries rules and deterring encroachment into the bay by commercial vessels. Education and awareness campaigns during the FISH Project, and social marketing campaigns (2010–2012) in Lanuza and Cortes municipalities, sought to build constituencies in favor of conservation and fisheries management.

As a result of these developments, the LBDA strengthened fisheries enforcement, reduced destructive and commercial fishing prevalence in the bay, and made improvements to the ecological health of coral reefs in several MPAs, three of which have been recognized with national awards (in 2011 and 2013) for the effectiveness of their management (FISH Project 2010b).

Several key strategies were found to be important for the establishment and partial institutionalization of EAFM arrangements (Table 3). The history revealed the importance of the higher-level institutional and local environmental crises as triggers for change, and how different types of leader enabled these strategies. Collaborative leaders (such as the LBDA Executive Director and certain municipal coastal resource managers and people’s organization chairs) displayed political skills and personal qualities (e.g., charisma) to enroll political leaders with the formal authority and control of resources for municipal fisheries management, and also leveraged resources and brokered relationships horizontally among municipal actors and vertically to provincial, national, and international actors. Several of the strategies sought to institutionalize the new alliance-based EAFM regime: improving the national institutional enabling environment; establishing formal laws and organizational structures; securing the commitment of local governments to sustain financial and human resources; and changing attitudes and mindsets of fishers. Nevertheless, the process of institutionalizing the LBDA and its associated tools and practices met many challenges.

Resistance to new institutional arrangements

With bay-wide and municipal enforcement strengthened, apprehensions of commercial fishers operating illegally inside the bay led to court proceedings and the impoundment of their vessels and gear. Elite families had invested significant capital in Danish seine gear, and fishing beyond 15 km increased operational costs of fuel and labor. They therefore sought to resist the new institutional arrangements of the LBDA.

All cases filed against commercial fishers in the mid- to late 2000s were dismissed at the Regional Trial Court on various grounds, which most respondents attributed to the biases of judicial personnel because of their vested interests in Danish seine fishing. Also, some informants claimed that the political influence of the largest commercial fishing operators made it politically challenging for local politicians to fully enforce fisheries rules. Violent resistance was also reported, such as attempted assassinations of LBDA staff and MPA managers. A commercial fisher’s perspective was that they possessed permits for their activities, issued by the national fisheries agency, the Bureau for Fisheries and Aquatic Resources (BFAR), and yet they were being unfairly harassed by LBDA enforcers, pointing to the damage caused to their vessels.

Some owners of apprehended commercial vessels filed counter-cases against the LBDA that contested the legality of bay-wide laws and enforcement. In response, the LBDA ended bay-wide enforcement activities and began only to provide coordinating services to the municipalities rather than directly implementing activities such as enforcement and capacity development itself. In 2010, the national Court of Appeals reversed all the decisions of the regional court, but the institutional adjustments had already been made.

Although some fishers were actively involved in MPA management and fisheries enforcement, there was also strong resistance to MPAs and new fisheries rules from small-scale fishers because of the perceived short-term impact on their livelihood from restrictions on where they could fish and the prohibition of destructive but efficient gear. The innovation history and Net-

Table 3. Strategies for enabling and institutionalizing an ecosystem approach to fisheries management (EAFM) in Lanuza Bay, Philippines.

Strategy	Reasoning
Mobilizing powerful actors	Recognition of the fisheries crisis was not sufficient to bring about change; it required the enrolment of municipal mayors for action to be taken locally. Without their buy-in, agreement to form the alliance would not be possible, and donors would not have invested in the area
Building and sharing knowledge	The introduction of scientific knowledge through seminars and the communication of ecological assessments were cited by community leaders as turning points in their understanding of the decline in fisheries and the importance of protecting ecosystems for the fisheries
Developing social networks	Fisher relations (bonding ties) were strengthened through people's organizations, which provided a focal point for resources and training; the development of bridging ties among local government staff and mayors across the alliance; and developing ties with national and international donors to leverage resources and expertise to make EAFM feasible
Framing problems and having a rallying issue	Nongovernmental organizations and donors introduced ecosystem concepts to frame the problem and suggested ecosystem-based management tools and approaches as a solution. Danish seine fishing provided a rallying point for collective action because it was identified as a primary threat to small-scale fisher livelihoods. The Bukat Buhay rally was considered critical for building momentum in support of alliance-based EAFM
Strengthening cross-scale relations	The FISH Project sought to assist the national government with reviewing and enhancing the implementation of existing national laws and policies such as the Fisheries Code and expanded constituencies to generate political support for sustainable fisheries management through media and public awareness campaigns. In 2010, however, only one-third of policies supported by the project had been adopted or implemented (FISH Project 2010a)
Routinization	New laws and organizational structures formalized EAFM rules and collaborative arrangements in Lanuza Bay; personnel and resources were committed by local government units to fund and staff management activities beyond the termination of donor projects
Changing worldviews and constituency building	Several strategies (e.g., social marketing, education campaigns) to change values, mindsets, and attitudes of fishers were recognized as critical for sustaining EAFM in Lanuza Bay

Map revealed several resistance strategies. First, rules were flaunted by continuing to use outlawed gear as well as poaching from MPAs. Second, MPA guards and people's organization members were violently intimidated and MPA infrastructure was sabotaged, including the torching of one guardhouse and the cutting of marker buoys. Although the guards stressed their defiance in the face of such hostilities, one people's organization chair admitted that his members are no longer willing to confront intruders, and another, fearing for the safety of his family, migrated from the area. In some villages (*barangay*), active small-scale resistance was said to have declined over time for various reasons: strengthened enforcement and prosecution deterred it and appreciation of the need for ecosystem protection had grown (e.g., in the municipality of Cortes); or enforcement had weakened (e.g., because the people's organization had disbanded), reducing the need for resistance.

Patterns of resistance at the barangay level could be linked to a common ongoing problematic relationship identified on Net-Maps between the people's organizations, responsible for MPA management, and barangay councils. It transpired that people's organizations, although assumed to be representative of the fishing community by donor programs, often only represented a minority of the community and were often affiliated with a political party. In some cases, they formed a de facto opposition to the elected barangay council, which, representing the majority of constituents, generally opposed MPAs or sympathized with small-scale fishers intruding into the sanctuary because of the effects on their families' subsistence. Some barangay councils were reported to collude with illegal fishers in resistance strategies by, for example, withholding resources for MPA management,

releasing apprehended fishers without punishment, or taking direct action. In one example, members of a barangay council were jailed by the municipal government for threatening with *bolos* (knives) and spear guns workers who were constructing a MPA. If the barangay captains oppose fisheries management activities, the communities will tend to follow them, according to a key informant. Thus, they were sometimes thought to provide leadership for those resisting the new institutional arrangements.

Participants described a network of vested interests in destructive fishing among politicians, the Philippines National Police (PNP), and small-scale fishers.

Fisherfolk had protection from corrupt political leaders, the PNP, and the Municipal Office for Prosecution, who received a daily supply of fish from the people.... When they informed officials about dynamite fishers, the case was dismissed every time by the Office for Prosecution. [People's organization] members felt afraid for their personal safety because of this protection of illegal fishers ... The PNP were even the suppliers of the dynamite, so they would alert fishers when they were on patrol by firing warning shots and collect fish from the fishermen. (Chair of a people's organization).

Under the Philippines' administrative system, municipal mayors have political control over the police in their territory (Varona 2010). With this authority, mayors were alleged to pardon apprehended illegal fishers in return for political support at elections, a form of corruption known as clientelism (Reid 2008). Barangay captains also engaged in similar clientelism by releasing fishers caught fishing inside no-take MPAs. The police were

widely accused of accepting bribes from illegal fishers and tipping off their kin when undertaking enforcement patrols. The police were often portrayed as apathetic or unwilling to enforce the law, which was attributed by three informants to the police fearing counter-charges in the courts by fishers protected by powerful interests or politicians. Thus, even those who did not benefit from patron-client relations with serving politicians expected protection from opposition politicians when they were prosecuted for a fisheries offence. Persisting throughout the studied period of the LBDA's history, corruption undermined the legitimacy of EAFM rules, weakened enforcement, demotivated enforcers, and reduced trust among collaborating actors.

Erosion of unembedded institutions

From the late 2000s, resistance strategies and social and political dynamics resulted in the weakening of EAFM institutions in Lanuza Bay. First, the counter charges from commercial fishers led to a weakening of bay-wide enforcement and a return to LGU-dominated fisheries management, which, according to an innovation history interviewee, resulted in the reascendance of parochialism and clientelism.

Second, following the end of the FISH Project in 2010, financial resources declined dramatically, leading to a reliance on limited LGU budgets, which are stretched across multiple local development priorities, including health and education. Management activities, enforcement, and ecological monitoring became under-resourced, and damaged equipment and infrastructure such as MPA guardhouses destroyed by typhoons failed to be repaired or renewed. At the alliance level, LGUs suspended financial contributions to the LBDA, which was then unable to perform all its functions or facilitate transmunicipal meetings. Thus, sustainable financing had not been fully routinized.

The successful transition from donor to LGU resourcing relied on maintaining the political will of municipal mayors, which proved challenging across three-year election cycles. When the LBDA was founded, the mayors shared an ecosystem approach perspective, nurtured by donor programs. Over time, however, all the founding mayors had completed their term limits and had been succeeded by mayors that were widely considered to be less committed to the alliance. Some new mayors prioritized the development of nonfishing economic sectors such as agriculture or commercial mining. Weak political will was reflected in poor attendance at LBDA council meetings, failures to pay financial contributions to the LBDA, and the underfunding of municipal fisheries programs. Dependence on political will was found to make the institutionalization of EAFM problematic.

Political will varied markedly among the municipalities, which led to variable investment in and implementation of fisheries management, with stipends to MPA guards often unpaid and fisheries rules not enforced. As a consequence, poaching from MPAs remained common in most of the municipalities, and some fishers continued to use destructive gear. The most progressive LGUs became reluctant to allow entrance into their waters by fishers from municipalities that were not regulating fishing activities. This reflected a further retreat to parochialism from bay-wide ecosystem management.

Diverging development priorities

The year 2009 marked the beginning of a nickel mining boom in Carrascal, the northernmost municipality of the LBDA (Fig. 1). The clearance of forest for open pits and roads exposed soils and increased sediment run-off into coastal waters, causing the siltation of coral reefs, according to conservationists and MPA managers. Ships, exporting the raw material to China, were also reported to have grounded in an MPA in Carrascal and caused minor oil spills. In addition to the environmental effects, the Net-Maps showed that mining threatened relations among the LBDA members. Mining was not discussed at the LBDA council meetings out of respect for the legal autonomy of each member municipality to make development decisions, which negatively affected trust among the LBDA members, according to Net-Map interviewees. Conservationists claimed that the economic opportunities of mining are changing the attitudes of the public away from marine conservation, and that mining companies are influencing local politics by bribing local officials and financing the election of pro-mining candidates. Thus, in addition to the reported impacts on the marine ecosystem of Lanuza Bay, mining divided the members of the LBDA council and revealed its limitations as an institution to resolve transboundary issues that are not shared concerns of all member LGUs.

Contextual forces

The history of the development of and resistance to the LBDA was influenced by the socioeconomic, political, and institutional contexts. While other factors are also likely to be important (e.g., cognitive and cultural; Coulthard 2008), the discussion of contextual factors is presented to illuminate the specific challenges raised by participants during the participatory research process.

Institutional context

The Fisheries Code (1998) provided the enabling conditions for municipalities in the bay to group themselves to manage coastal resources. However, the legal framework did not specifically embrace EAFM as an overarching concept for fisheries management in the Philippines, and the conservation provisions of the Fisheries Code and subsequent policy and legislation remained largely unimplemented (Christie et al. 2007, Pomeroy et al. 2015). Although, technically, noncompliance can be punished by national agencies with fines and reduced project funding, and compliance can be incentivized with increased funding (Lowry et al. 2005), there was little evidence of their application in Lanuza Bay to encourage municipal, let alone alliance-based, management of inshore fisheries and habitats.

National agencies with responsibility for fisheries and coastal management, i.e., BFAR and the Department of Environment and Natural Resources, take a hands-off approach to management of municipal waters (Sparks 2012), despite having powers under Executive Order 533 (2014) to mainstream integrated coastal management at every level of government. The FISH Project (2010a) end of project report found that although national policy enshrines principles of sustainable development, BFAR's priority, in practice, remains to increase fisheries production to maintain the food security of a rapidly growing population. This bias of BFAR was evident in Lanuza Bay, where projects promoted mariculture and the adoption of new gear such as fishing nets and motorized fishing vessels. Similarly, the

provincial government has no mandate or incentives from national government to contribute to coastal management or facilitate intermunicipal cooperation on resource management. National agencies and the provincial government, it appears, only participated in EAFM when donor agency technical assistance and funding was available.

This national institutional context explains why local politicians can pick and choose in Lanuza Bay whether they implement provisions of the Fisheries Code (1998) and may explain the disparities in municipal implementation in the LBDA. Weak higher level support resulted in dependence on NGO and donor investment to incentivize EAFM. When donor projects end, financial incentives for EAFM disappear, offering a potential reason for the financial and material unsustainability of EAFM in Lanuza Bay across election cycles. Decentralization has enabled the proliferation of local initiatives and encouraged comanagement with stakeholders in the Philippines, but the need to account for ecosystem processes requires broader, integrated approaches at larger spatial and temporal scales. Without national or subnational institutional support, sustaining such approaches is likely to be problematic.

Political context

Many of the challenges to institutionalizing EAFM in Lanuza Bay are associated with the political culture of the Philippines. Patron-client relations and the influence of political elites are products of historic and macro-level political dynamics. Precolonial and postcolonial relations in the Philippines have left a legacy of entrenched power relations that have engendered poverty, extreme inequality, and a weak and corrupt state (Hedman 2006, Christie et al. 2009a). The Philippines is diagnosed by Johnston (2008:205) as a syndrome of “oligarchs and clans, with powerful families and their entourages plundering a weak state”. Political dynasties, clientelism, and election vote-buying are commonplace. The position of elected office as municipal mayor or provincial governor affords control over state resources and discretion on development priorities and law enforcement (Quah 2004, Sidel 2004).

The formal and informal power of municipal mayors makes them influential allies for EAFM in Lanuza Bay, but it also explains their capacity for clientelism and the dependence on their political will. Powerful local elites also make formidable opponents to EAFM if it affects their interests, including politicians funding counter-charges made by small-scale fishers and forwarding the interests of commercial fishing operators. A political dynasty was alleged to control local politics in the province of Surigao del Sur, according to key informants. The family was described as “king-makers”, and people opposing them risked political downfall. Such superordinate power brokers are often known to be behind the rise and survival of politicians in the Philippines (Sidel 2004). The family has vested interests in mining in Carrascal, and its power broker status was alleged to have muted opposition to mining activities among the political classes, despite the transboundary ecological impacts. These power dynamics may explain why the LBDA is unable to provide a forum to address mining concerns. A key informant said that the mayors were willing to address destructive commercial fishing because it did not harm their interests directly, but addressing the impacts of mining is not possible because it would affect the interests of the most powerful family in the province.

Socioeconomic and demographic context

In the 1980s, while destructive fishing practices were widely used, fish abundance remained high because, according to innovation history participants, there were few fishers and limited demand from the local population. However, the population grew by almost 12% between 2000 and 2010 (Philippine Statistics Authority 2013), which increased demand, the number of fishers, and, ultimately, fishing pressure. Furthermore, Lanuza Bay has high rates of poverty; five of the municipalities in the alliance are classed as 4th and 5th in terms of income (the lowest classes, with average annual incomes of PhP 15–35 million or USD \$287,000–\$671,000), and 67% of fisher households are poor (FISH Project 2010a). For fishers, generating income and producing food to meet daily needs is therefore a priority. Few alternative livelihood opportunities exist and, like elsewhere in the Philippines (Fabinyi 2010), fishers lack the capital to invest in larger vessels to expand their geographical range to the offshore fishery. They are therefore forced to increase fishing effort in nearshore waters to maintain catch levels. The dependence on the inshore fishery of Lanuza Bay is such that the disruption of fishing during bad weather results in temporary food shortage events. Under such precarious conditions, resistance to measures that have the potential to reduce catches by, for example, closing off traditional fishing grounds as no-take MPAs and imposing fishing effort restrictions, is likely. Despite the intention to provide livelihood benefits (e.g., from spillover of fish from MPAs), EAFM arrangements in Lanuza Bay have not yet addressed these demographic, poverty, and fishing-effort drivers, meaning that the fisheries remain unsustainable.

DISCUSSION AND CONCLUSION

I have presented data on the forces driving and opposing the institutionalization of EAFM in the Philippines and, more broadly, governance transformations that have the potential to contribute to sustainability goals. These findings have critical implications for the conceptualization, design, and practice of EAFM, and for how to theorize and enact transformations toward a sustainable future.

The analysis of driving forces largely confers with existing resilience theory on transformations. Two triggers, i.e., the fisheries crisis and decentralization of inshore fisheries governance, created a window of opportunity for local political and collaborative leadership to frame the fisheries problem from an ecosystem perspective, enroll powerful actors, leverage resources, and develop coalitions and social networks in support of developing new institutional arrangements for fisheries management based on ecosystem principles. Institutionalization strategies included the strengthening of cross-scale relations, development of formal institutions, efforts to routinize human and financial resourcing of EAFM tools, and changing social norms through behavior change, education, and constituency building initiatives. The data, however, go beyond current theory by exposing the tension between these driving forces and the deep-rooted forces opposing the institutionalization of transformations.

The results illustrate how transformations toward sustainability are likely to be extremely resource intensive and take a long time. In Lanuza Bay, national government support and local government budgets are limited, and donor funding is time limited, creating an inherent unsustainability of EAFM activities, an issue that pervaded integrated coastal management in the

Philippines in the past (Christie 2005, White et al. 2005). This situation points to the need for long-term investment and sustainable financing for transformations to be realized, given the implied depth of change of institutions, technologies, beliefs, and values (Lockwood 2015). Sustaining investment for sufficient time to institutionalize a transformation fully is likely to be challenging without addressing forces of resistance.

The resistance to the new EAFM institutions in Lanuza Bay draws attention to the role of agents of resistance who seek to protect their vested interests by maintaining the status quo (Pelling 2010). In agreement with Meijerink and Huitema (2010), my results show that strategies and leadership capacities are displayed by those opposing new institutions in a similar fashion to those driving change. Local politicians were alleged to sponsor illegal fishing, barangay captains and councils often led resistance actions, and patron-client relations abetted noncompliance with rules. Past research has documented the lack of support for MPAs among fishers because of socioeconomic impacts (e.g., Jones 2006, Christie et al. 2009b, Chaigneau and Brown 2016), but my results highlight specific (legal, political, and violent) resistance strategies and how they become entangled in local politics. Literature on transformation leadership and, more widely, environmental leadership has focused uncritically on leaders bringing about positive change (Evans et al. 2015), but my findings suggest that those resisting change deserve to be analyzed to the same extent (Schmitz 2015). Indeed, the outcome of messy political tussles between coalitions of agents of change and agents of resistance, with differential power and interests, is likely to shape the character, viability, and sustainability of EAFM arrangements and, by inference, other deliberate transformations. This situation points to the necessity to account for politics and social diversity in resilience and transformation research (Fabinyi et al. 2010). Conflict in Lanuza Bay between fishers engaged in MPA management and other fishers resistant to new regulations, and the political affiliations of these two camps, demonstrates that even local fishing communities are highly socially diverse and politicized. Conceptualizations of social-ecological traps (Steneck et al. 2011, Enfors 2013, Boonstra and de Boer 2014) currently lack and would benefit from a consideration of such politics and acts of resistance that reproduce traps. Thus, my results add weight to the arguments that deliberate transformations are inherently political processes and that resistance is a central consideration in transformation research (Scoones et al. 2015, Blythe et al. 2018).

The capacity of stakeholders to drive or oppose the institutionalization of EAFM was linked to the unequal distribution of power among stakeholders, shaped by the cultural, historical, and political contexts. Powerful government actors, like the municipal mayors in this case, may need to be enrolled in enacting transformations, but reliance on them can make the process of institutionalization vulnerable to political dynamics (e.g., election cycles) and shifting development priorities. This finding highlights how the active participation of a benevolent state in supporting sustainability transformations cannot be assumed (Lawhon and Murphy 2012), especially in contexts like the Philippines, where the state can serve narrow interests (Sidel 2004). Similarly, the social position of nonstate agents of resistance determined their capacity to block the shift

to EAFM. Owners of commercial fishing vessels could file legal challenges because of their financial assets, have cases against them dismissed because of (allegedly) unscrupulous ties with the regional judiciary, and (allegedly) influence local government decision making on fisheries laws through kinship ties and patronage networks. Ultimately, these actions undermined collective action and the embedding of new rules, practices, and other institutions. Such power relations are common in Philippines fisheries (Fabinyi and Dalabajan 2011) and across Southeast Asia, negatively affecting the scope for changing fisheries systems (Ferse et al. 2012). EAFM, and ecosystem-based management more widely, was designed by and for developed nations; its successful institutionalization in tropical developing countries will require its reworking to account for such local political, socioeconomic, and governance realities (Aswani et al. 2012).

My study shows that the higher level institutional context may play an important role in addressing such parochial risks to the institutionalization of small-scale transformations. In this case, the lack of a national institutional framework, obligations, or incentives that promote EAFM led to a dependence on donor resources and local political will and elite capture of decision-making processes. As Jones (2014) asserts for effective MPA governance, national government obligations and incentives may be necessary for EAFM to be institutionalized in the Philippines. For transformation science, this insight supports the need to strengthen cross-scale relations to institutionalize new system trajectories (Moore et al. 2014) and the need to “scale up” governance innovations to have broader and lasting effects (Westley and Antadze 2010). In the Philippines, obligations could promote coordination among decentralized decision-making units to sustain EAFM across election cycles and to set and enforce targets for sustainable fisheries and biodiversity conservation that cannot be overruled by parochialism. Other studies have shown that higher level institutional support is important for ecosystem-based management to be sustained (Mulgan et al. 2007, Biggs et al. 2010), but it cannot be assumed that higher level actors would not also be enmeshed in contradictory relations of power.

The results also highlight how sectoral transformations do not occur in isolation; rather, the wider political economy and changing drivers affect institutionalization processes. The transboundary ecological and political effects of large-scale mining were regarded as the most severe challenge to EAFM success and institutionalization. Further, high population growth rates, poverty, and the lack of alternative livelihood opportunities maintain high dependence on fisheries, meaning that any restrictions of fishing effort will be strongly resisted. This result suggests that progress toward sustainability in one sector can be derailed by other politically prioritized sectors that divert resources toward goals that are not necessarily congruent with sustainability, and that changing the governance of one sector is unlikely to be sufficient given the cross-sector root causes of unsustainable development pathways. Therefore, EAFM alone is unlikely to resolve fisheries crises in tropical developing nations because fishing effort reductions will require, for example, sustainable alternative livelihoods, family planning, and poverty alleviation. Nesting EAFM within a broader ecosystem-based management framework and making explicit cross-sector links is

espoused in planning guidelines (FAO 2003), but examples of integrated approaches are rare, especially in the developing world.

I did not focus on the problems of institutionalizing EAFM for the sake of being negative and critical; the story of Lanuza Bay is predominantly one of successful collaboration in challenging circumstances. My point is to demonstrate the tension between driving and opposing forces, and how powerfully entrenched, mutually reinforcing feedbacks embedded in socio-politics and culture make transforming governance systems, and social-ecological systems more widely, extremely difficult. From this perspective, the institutionalization phase of transformative processes becomes a critical area of research. Because most existing studies of transformations in ecosystem management are conducted either during or just after the adoption of new management arrangements, they fail to observe how seemingly successful programs can become bogged down in political struggles, emergent challenges, and unintended consequences (Khavul et al. 2013). By understanding contextual barriers and sources of resistance, research and practice can begin to find ways to make sustainability transformations feasible, socially acceptable, and just. As the global community grapples with the realities and challenges of achieving the 2015 Sustainable Development Goals, the importance of this emerging field of social science will become ever more apparent.

Responses to this article can be read online at:
<http://www.ecologyandsociety.org/issues/responses.php/10996>

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