Chapter 3
Community-Based, Co-management for Governing Small-Scale Fisheries of the Pacific: A Solomon Islands' Case Study

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Abstract The discourse on solutions to address small-scale fisheries concerns in the Pacific tends to focus heavily on community-based forms of co-management. Decentralizing governance to the community level permits responsiveness and specificity to local dynamics, not possible through hierarchical governance. It also allows for proper recognition of the (often legally backed) customary rights of local resource owners, common throughout the Pacific. Partnerships between communities and governments, NGOs or research organizations draw together knowledge, expertise and institutions to develop and implement co-management arrangements. In exploring Solomon Islands as a case study we find that interactions between community-based, co-management (a form of co-governance), and self-governance (particularly customary institutions) are fundamental for contextualizing and 'fitting' management to the community level – and that this helps to account for the exceptionally high social and ecological diversity and complexity of Solomon Islands. Community-based, co-management represents a hybrid of traditional and contemporary, local and higher level images, instruments and actions. Interactions between community-based, co-management and hierarchical governance can bolster and inform local management and governance solutions. This is particularly true (and necessary) for pressures (e.g., population growth and commercial, export-orientated exploitation) that extend beyond the local scale or have not before been encountered by customary institutions. While these relations can increase governability, they can also be contradictory and undermining, particularly when objectives are dynamic

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and differ across scales. Finding the 'best mix' of governance modes and responses is a moving and elusive target. Nonetheless, we conclude that while community-based, co-management is an appropriate and fitting mode for increasing the governability of Pacific small-scale fisheries in some contexts, in its current form it alone is not up to the task of realizing fisheries sustainability objectives. We recommend that small-scale fisheries policy more explicitly seeks, and tests, new forms of governance interactions amidst the diversity and complexity of Pacific small-scale fisheries.

Keywords Co-governance • Decentralised • Coral reef • Food security • Customary • Network • Hybrid

Introduction

Small-scale fisheries provide food, income, and a way of life for a high proportion of the largely rural and coastal dwelling populations of Pacific Island Countries and Territories. Within the Pacific region small-scale fisheries are deemed important for their role in maintaining self-sufficiency and for their potential to fuel development in rural areas. Pacific populations commonly demonstrate high levels of participation in small-scale fisheries and very high consumption rates of fresh fish as the major source of protein (Bell et al. 2009) where Pacific people consume on average around 34–37 kg of fish per year compared to 16.5 kg for people worldwide (Gillett 2009). Coastal marine resources provide the Pacific Islands with US$262 million in annual revenue, and are a major contributor to many national economies (World Bank 2000). Although cash-based economies are expanding, in many Pacific Island countries where human development is low, the subsistence economy, including small-scale fisheries, plays an important role in human well-being (Adams 2012). However, there are concerns for the sustainability of small-scale fisheries in the light of rapid population growth, increased connectedness to global markets, intensifying interactions with commercial enterprise and projected effects of climate change (Gillett and Cartwright 2010).

The discourse on solutions to address small-scale fisheries concerns in the Pacific tends to focus on co-management, and in particular on community-based, co-management. This reflects a more global trend that is based on the growing realization that resource status and exploitation are driven by social and economic factors, and therefore that governability will be increased when resource users are actively involved in designing and implementing management solutions (Pomeroy 1995; Berkes 2009). As a result, co-management strategies are now globally a mainstream approach to managing many natural resources, including those utilized by small-scale fisheries (Evans et al. 2011). Resource-user involvement supports social justice, equity and empowerment, and legitimacy, which can lead to improved 'fit', better acceptance and enhanced compliance with management (Pomeroy 1995; Berkes 2009). Fisheries co-management is defined by relationships between a

resource-user group (e.g., local fishers) and another entity (e.g., a government agency or non-government organization) in which management responsibilities and authority are shared (Pomeroy and Berkes 1997; Evans et al. 2011). In practice, co-management arrangements vary according to the degree of authority and influence the resource users have over management, relative to partners (Sen and Nielsen 1996). In this chapter, we focus on the 'collaborative, community-based' end of the co-management spectrum (Pomeroy 1995), that many initiatives within the Pacific region aspire towards (Govan et al. 2009).

In many Pacific Island Countries and Territories national governments are poorly resourced (most resources that are tagged to fisheries are directed towards industrialized fisheries such as tuna) relative to the scope of small-scale fisheries. Small-scale fisheries are typically diverse, but particularly in the Pacific due to the region's exceptionally high cultural diversity and marine biodiversity (Veron et al. 2009). Small-scale fisheries support subsistence of the predominantly rural and coastal dwelling populations, and so most fishing activities are hundreds to thousands of kilometers from urban centres where governments are based. Further, in many Pacific countries, there are legally recognized systems of self-governance involving customary tenure and traditional management. Resultantly, from the perspectives of resourcing and logistics, well-being, and legal rights community-based, co-management is a mainstream and popular strategy for addressing small-scale fisheries concerns (Jupiter et al. 2014). However, concerns about small-scale fisheries sustainability, economic performance, and governance more broadly, persist widely across the Pacific.

Research Questions and Methods

We present Solomon Islands as a Pacific Island case study of coastal small-scale fisheries. We dig deeper into a series of examples of community-based, co-management within Solomon Islands by drawing on published and unpublished work, particularly (Cohen et al. 2012, 2013; Cohen and Alexander 2013; Cohen and Steenbergen 2015). The methods include semi-structured interviews, fish catch surveys, and key informant interviews. Methods are described in detail in the articles from which we cite results.

Our overarching research question is*; In Pacific Island developing country contexts, can community-based, co-management (a) deliver culturally appropriate and locally governable measures adequate to deal with contemporary pressures on resources, (b) be locally governed in an equitable and participatory manner, and (c) influence and be influenced by higher scales of governance and learning?* To put Solomon Islands small-scale fisheries under the microscope we use the Interactive Governance Framework to: (i) analytically examine features (diversity, complexity, dynamics across scales) of the *system-to-be-governed* (section "System-to-be-governed"), and the *governance system* (section "Governing system"); (ii) concentrate explicitly on

interactions between the hierarchical governance, co-governance and self-governance modes, and interactions with the *system-to-be-governed* (section "Governance interactions and outcomes"), and (iii) examine the goodness of fit, responsiveness and performance (Chuenpagdee and Jentoft 2013) of the *governing system* in addressing challenges faced by small-scale fisheries (section "Governance interactions and outcomes"). In section "Governance interactions and outcomes", we are broadly asking; what characteristics and interactions between the features of the Solomon Islands' small-scale fisheries *system-to-be-governed* and the *governing system* render it more or less governable? What does this mean for the future of small-scale fisheries governance in Solomon Islands and the Pacific Islands region?

In answering our research question we also align our responses to the three conditions that are the main focus of the Framework (Chuenpagdee and Jentoft 2013). First, by examining local governability and cultural appropriateness we explore 'goodness-of-fit' between the *governing system,* including governance institutions, and the *system-to-be-governed*. We then look at how the creation of institutions is influenced from across scales and how 'responsiveness' of institutions differs between modes of governance. Third, in examining the adequacy of management for dealing with contemporary pressures on resources, and whether governance is equitable and participatory, we start to understand the 'performance' of the governing system. Chuenpagdee and Jentoft (2013) highlight that decentralized governance faces its own set of challenges; in this chapter we unpack some of the particular challenges associated with our case and critically analyze community-based, co-management as a principle vehicle with which to govern small-scale fisheries of the Pacific.

System-to-Be-Governed

The Solomon Islands form a double-chained archipelago (Fig. 3.1a) spanning 1,500 km, and is comprised of large and small islands and atolls surrounded by reef, mangrove and seagrass habitats and extending rapidly into deep ocean (Fig. 3.1b). Solomon Islanders predominantly (80 %) reside in rural areas, and 94 % of the rural population live within 5 km of the coast (Fig. 3.1d; Foale et al. 2011). While population densities are relatively low on a global scale, the population growth rate is amongst the highest i.e., 2.3 %. The population is incredibly *diverse* in terms of history, language (>70) and culture, ranking 6th in the world in terms of biocultural diversity (Table 3.1; Harmon and Loh 2004). Land and marine tenure rights and inheritance are dictated by complex social relationships; customary matrilineal or patrilineal descent systems (depending on region), kinship or clan affiliations, and other social relationships and transactions. Cultural relationships and social norms are embodied in *kastom.*[1] Many aspects of *kastom* have proven resilient to external pressure from colonization, Christianity, ethnic conflict and international

[1] Kastom is the pidgin English word for 'custom'; referring generally to cultural norms and institutions.

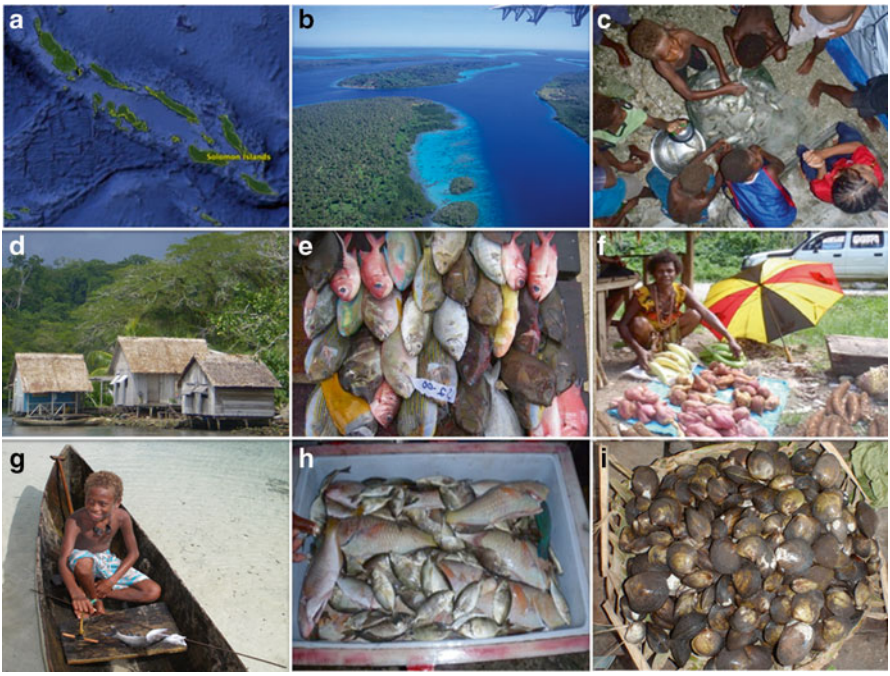

Fig. 3.1 Panel figure depicting Solomon Islands, showing (from *left* to *right*, *top* to *bottom*); (**a**) the double-chained archipelago, (**b**) low lying islands, (**c**) fish critical in diets, (**d**) coastal housing, (**e**) multi-species fin fisheries, (**f**) small-scale agricultural and fisheries marketing, (**g**) participation in fisheries, (**h**) transportation of fish to markets, and (**i**) mangrove invertebrates for household subsistence

development agendas even where these have acted to undermine traditional arrangements (Ruddle 1994, 1998; Hviding 1998). *Kastom* and associated customary tenure can both foster and hinder resource management and rural development (Hviding 1998), and remain critical dimensions of the governability of small-scale fisheries in the Pacific and Solomon Islands. Additionally, population growth, urbanization and market integration have been influential to differing degrees in different locales and underpin highly *dynamic* social landscapes (Table 3.1).

People's livelihoods in Solomon Islands are diverse and dynamic: the norm is that rural dwelling people are non-specialist fishers and farmers (Fig. 3.1c, f), and opportunistically participate in other forms of livelihood activities for food and income (Govan et al. 2013b). While participation in small-scale fisheries is high (i.e., estimated to be over 80 % of households), it is also variable in space and time, depending on conditions within the fishery and external opportunities and constraints. Fisheries are viewed as a mainstay of subsistence lifestyles and a foundation of food security (Bell et al. 2009), but also as a potential engine to drive local and national development. Men, women and youth participate in small-scale fisheries (Fig. 3.1g) – harvesting, processing and marketing. Men's fishing activities often

Table 3.1 Summary of the diversity, complexity and dynamics of the social and natural subsystems of small-scale fisheries in the Pacific across national, provincial and local levels

	Social	Natural
Diversity	Ethnicity	High coral diversity (486 species)
	Language (70+) i.e., a proxy for cultural diversity	High fish diversity (1,019 species)
	Non-specialized fishers	Extensive seagrass and mangrove habitats
	Multi-species fishery	Relatively low value, subsistence fisheries
	Gear diversity	
	High participation – men, women, children	High value, commercial small-scale fisheries
Complexity	*Kastom* (cultural norms and institutions)	Geography (Volcanic archipelago, low-lying islands)
	Intermarriage	
	Conflict (Ethnic tensions 1999)	Connectivity between land and sea (Impacts from logging and mining)
	Colonial history (Independence 1979)	
	Gender dynamics	
Dynamics	Very high population growth	Increasing rates of environmental decline
	High rates of urbanization	Climate change
	Market integration	
	Changing aspirations	
	Changing place of *kastom* and *d*ecreasing respect for customary authority	
	Fisheries (highly dispersive or migratory) cross tenure boundaries (small governance units)	
	Importance of fisheries at individual, household and community level are dynamic, relative to other opportunities or issues	

involve the use of small boats, fishing close to home exploiting coastal habitats to deeper waters further afield. Women more frequently harvest from shore or in shallow reef and mangrove areas (Fig. 3.1i) proximate to their home village (Kronen and Vunisea 2009). The benefits derived from fisheries are mediated not just by direct participation in harvesting, but also by factors ranging from intra-household gender relations to urbanization to international markets, as articulated by Foale and colleagues (2013) in the context of future food security. The cross-scale complexities of the social *system-to-be-governed* in Solomon Islands, and the Pacific more widely, provide both opportunities and challenges to the governability of small-scale fisheries, as expanded below.

Solomon Islands hosts coral reef systems that are globally recognized for their exceptionally high biodiversity (Veron et al. 2009). Small-scale fisheries operate in coral reef, mangrove, lagoon and near-shore pelagic environments, but concern for small-scale fisheries, resource and habitat decline and impetus for management tend

to focus heavily on coral reefs (e.g., Bell et al. 2009; Solomon Islands Government 2009). In fact, Solomon Islands' reefs and reef-associated resources are in relatively good shape if considered globally (Green et al. 2006). Nonetheless, fishers, managers and researchers are concerned about the resource declines they observe in all coastal zones. For example, based on estimates of coral reef fisheries production relative to future demand for reef fish, Solomon Islands is projected to be one of 11 Pacific Island countries for which there will be a food security shortfall by 2030 (Bell et al. 2009).

Rich biological diversity translates into a high diversity of small-scale fisheries target taxa (Fig. 3.1e). Small-scale coastal fisheries focus on 20 reef-associated families of fish for food (Pinca et al. 2009) or around 180 species (Skewes 1990); however, invertebrates, near-shore pelagic and mangrove-associated species also contribute to small-scale fisheries. Invertebrates play an important role in diets, and trochus (*Trochus niloticus*) and sea cucumbers dominate small-scale fisheries exports. However, sea cucumber fisheries of the Pacific commonly operate on "boom and bust" cycles, iterating between national bans implemented in response to concerns about over-exploitation, and relatively intense harvesting to capture benefits from the lucrative trade (Friedman et al. 2011). Common small-scale fishing methods include spear fishing, handlining, netting and gleaning. The composition of catches and the prevalence of fishing methods vary substantially between villages, regions and fishers. Vessels are most commonly dug-out paddle canoes (Fig. 3.1g), and to a lesser extent boats with outboard motors. Finfish and invertebrates harvested from inshore areas are commonly consumed locally, though any opportunities for sale locally or at provincial centres may be seized depending on proximity and accessibility to transportation (Fig. 3.1h).

Governing System

Governance of small-scale fisheries is influenced by formal national and provincial level governing bodies and institutions, as well as informal cultural and local institutions that operate at the community or clan level. The relative influence of state versus local institutions varies depending on social group, geographic location, resource of concern, exploited habitat and fishing method, but is also dynamic depending on local or state responses to resource decline, harvesting opportunities or conditions external to the fishery. In Solomon Islands, coastal ecosystems and fisheries are formally governed by the state through environment and fisheries legislation administered by their respective government ministries (Lane 2006). Additionally, nine Provincial governments are recognized, in theory (Lane 2006) and in policy (e.g., Solomon Islands Government 2009), as key units for decentralization of resource management and development. In reality, the financial, technical, and human resources required for delivering services or governing in rural areas far exceeds those made available to Provincial Governments (Lane 2006; Govan et al. 2013b). The national government concentrates on managing commodity

invertebrates (e.g., trochus and sea cucumber) at points of export. Management instruments include size restrictions, export licensing and (in the case of sea cucumber) indefinite moratoria; instruments that are implemented to optimize economic efficiency, profitability, resource rent and/or sustainability. Rural communities are legally required to adhere to these regulations, but awareness and enforcement in rural areas is minimal. In practice, national and provincial governments have had low levels of success in affecting management on non-exported, small-scale fisheries (Ruddle 1998; Govan et al. 2013b).

This governance and management 'gap' has, in effect, been filled by numerous non-governmental organizations (NGOs) and research agencies working in Solomon Islands to support conservation of coastal ecosystems and management of small-scale fisheries. While these organizations hold no formally legitimized governing role, they commonly act as co-management partners to coastal communities and have been recognized as government 'partners' since 2007. In Solomon Islands, these partnerships have led to the formation of at least 137 community-based, co-managed areas (Cohen et al. 2012). In most situations the national and provincial governments have relatively little direct involvement in these management efforts, in part because their capacity has been prohibitively low. Yet, in the last 5 years several national level, government-led policies have sought to capitalize on this emergent model by (1) explicitly recognizing and promoting community-based, co-management as a principle, national approach for resource management and rural development, and (2) creating and investing in mechanisms (e.g., governance networks) to coordinate the 'partner' agencies involved, and to improve alignment with national policies and strengthen relationships with government agencies to build and supplement their capacity (discussed further in section "Can community based management of small-scale fisheries influence, and be influenced by, higher scales of governance and learning?").

At the village or local level, customary governance systems remain intact and influential to varying extents. In any one village or community there may be several clans, each with its own leaders and leadership structure, as well as elected village chiefs (White 2004). Since the introduction of Christianity into Solomon Islands in the early 1900s, the Church has also emerged as important in village governance (White 2004). The church is influential in deciding, declaring and enforcing rules, including those associated with community-based, co-management (Cohen and Steenbergen 2015).

Throughout much of the Pacific customary land and marine tenure systems persist; in Solomon Islands for example 87 % of land falls under customary tenure (AusAID 2008), which also frequently extends to coastal marine areas (Hviding 1998). Customary land and marine tenure align to different clans who have the rights to decide when and how resources are accessed, used and managed, and by whom (Hviding 1988). As a result, customary marine tenure is highly influential, and in fact foundational (Polunin 1984; Govan et al. 2009), in crafting and implementing contemporary small-scale fisheries management and development strategies in Solomon Islands, and many other Pacific Island countries.

In association with customary tenure, coastal societies throughout the Pacific have developed other norms and institutions that influence the way marine resources are used and governed (e.g., Johannes 1982). Scholars draw analogies between these customary instruments (e.g., bans on consuming or harvesting certain species; temporary reef closures; restrictions on fishing methods) and contemporary resource management instruments (Colding and Folke 2001). And in fact, customary instruments are commonly adapted, and integrated into contemporary community-based management efforts in Solomon Islands (discussed further in section "Can community-based, co-management of small-scale fisheries deliver culturally appropriate and locally governable instruments adequate to deal with contemporary pressures on resources?"), and throughout the Pacific (Johannes 2002; Govan et al. 2009; Cohen and Steenbergen 2015).

Governance Interactions and Outcomes

In this section we use our description of the *system-to-be-governed* and the *governance system* to analyze governability. It is argued co-governance is generally the better suited mode for governing highly diverse *systems-to-be-governed*, and will be more responsive to localized or relatively rapid change (Chuenpagdee and Jentoft 2013). Our case illustrates elements that fit with this generalization, but in this section we also highlight particular characteristics leading to reduced governability. We go beyond the typical focus on the implementation of management tools or institutions – taken to indicate effective community-based, co-management – to consider social and ecological outcomes of governability. In our discussion we provide examples and unpack ideas around flexibility, adaptation, sustainability, innovation and hybridization – which tend to be treated fairly favorably and uncritically in the literature. Here we explore what they mean for governability.

Can Community-Based, Co-management of Small-Scale Fisheries Deliver Culturally Appropriate and Locally Governable Instruments Adequate to Deal with Contemporary Pressures on Resources?

'Self-governance' of land and marine resources is prolific throughout the Pacific through local and customary governance structures (e.g., chiefly systems) and institutions (e.g., customary tenure, and area, method and consumption taboos). Yet, scholars argue that customary institutions evolved for social reasons and were not intended or necessary (due to low resource-use pressure on marine ecosystems) to promote ecological sustainability (Polunin 1984; Foale et al. 2011). This differentiation is important because it suggests fundamentally different *images* – whereby

customary resource rules are *social* institutions (underpinned by complex, often opaque and dynamic social relations and with the purpose of building and maintaining social capital), with the *potential* to be adapted and applied in a way that can address contemporary sustainability concerns. Extending this argument would suggest that, without some adaptation, self-governance is a poor *fit* in today's contexts and illaligned with *images* of longer-term sustainability or economic efficiency. In other words, in their current form customary institutions or self-governance are an important and fitting foundation and starting point, but not the *end point* for increasing governability of small-scale fisheries today. Integration of self-governance authorities and institutions with other governance arrangements needs to acknowledge their social and cultural foundations so as not to romanticize their promise for conservation purposes (Foale et al. 2011; Fabinyi et al. 2014).

To improve sustainability outcomes in contemporary contexts where pressures on resources are more diverse and intense, scholars argue that the application, design and intent of customary institutions will need to evolve (with various caveats and degrees of caution) – incorporating scientific information, modern management principles, and cross-institutional bolstering (Cinner and Aswani 2007; Foale et al. 2011). Interactions between self-governance and co-governance are common place in that local and customary institutions are explicitly and formally recognized as the foundations of contemporary community-based, co-management of coastal resources and fisheries (e.g., Apia Policy 2008). Co-governance inherently encourages the combination of knowledge sources, but also provides a platform for deliberation, identification and hybridization of values, norms and institutions (Jentoft and Chuenpagdee 2009). In practice partners might provide management advice, facilitate processes to integrate forms of knowledge and practice, and pursue mechanisms to bolster local management efforts and governance arrangements. In the Pacific a hybrid between local (customary) and science-based management and conservation practice is often sought (Govan et al. 2009; Aswani and Ruddle 2013). Yet, the resultant governance and management arrangements are rarely well-described or critically appraised. Here we ask, is the "resultant 'hybrid' form of management socially appropriate, locally governable and able to deliver benefits to fisheries and fishing communities?"

We focus our analysis on a specific *instrument* (and associated *governance system*); periodically-harvested marine closures or area "taboos", which are commonly employed in community-based, co-management in the Pacific (Govan et al. 2009; Cohen and Foale 2013). Taboos are cultural institutions that were historically implemented for relatively short periods to control use and access to resources for social objectives, e.g., to mark the death of a prominent community member, protect sacred sites, or "save-up" stocks prior to harvests for feasts or trading (Hviding 1998; Foale et al. 2011). We found that in contemporary community-based, co-management, taboos are closed for prolonged periods (whereas historically taboos were instated only on special occasions for finite periods) reflecting attempts to alleviate fishing pressure and enhance ecological sustainability. In practice, area openings were flexible, in response to local social and economic needs (e.g., school fees, contributions to social events), and were opened more frequently than origi-

nally planned (Cohen et al. 2013). The flexibility to change management practices in response to altered conditions or new knowledge is an important element of adaptive co-management (Armitage et al. 2008). Social and economic triggers to harvest make this measure locally acceptable and culturally fitting – yet too much flexibility may not align with longer term objectives of sustainability. While Kooiman and Chuenpagdee (2005, 327) suggest that "governing diversity takes a broad and long-term view on fisheries and incorporates fine-tuning and feedback", our case highlights that such fine-tuning may represent adjustments between longer and shorter term goals, rather than tuning towards better achievement of the longer term goals. It is arguable that "local fishers…often have a longer temporal perspective than government" (Kooiman and Chuenpagdee 2005, 338), but in developing country contexts in particular, necessity and desire for (relatively modest) improvements to livelihoods may take precedence over a longer-term view. This is an example of a hard choice between two desirable goals that may, in some cases, be contradictory (Kooiman et al. 2005).

Taboo areas are commonly employed to manage the diversity of multi-species and multi-method fisheries – something for which spatial management is often promoted. However, any particular harvesting cycle – whether planned or unplanned, annual or more frequent, intense or light, for hours or weeks – may fit with social objectives but may not allow for sufficient replenishment for some taxa (Cohen and Foale 2013). Taboos in the Pacific have, in some cases, been seen as a panacea, and managers may be asking too infrequently "What [particular] problem is this instrument supposed to solve? Why was this particular instrument chosen and not another one?" (Kooiman and Chuenpagdee 2005, 331–332). A more comprehensive suite of instruments might better fit the diversity of small-scale fisheries, yet other measures tend to be less readily accepted or implemented than taboos in Pacific community-based, co-management (e.g., Cohen et al. 2013; Léopold et al. 2013).

Implicit in community-based, co-management is that communities will be able, to some extent, to deal with enforcement and sanctioning locally. Partners may therefore prioritize their efforts towards communities where local governance is relatively robust and functional, and where customary institutions are intact. However, given there is declining respect for local authority and *kastom* in many regions of the Pacific (Macintyre and Foale 2007) governance may need local strengthening and external bolstering. Where enforcement and sanctioning are localized a range of traditional, religious and formal legal institutions and associated sanctions may be invoked; providing institutional diversity and redundancy that reflects Jentoft and colleagues' (2009) notion of legal pluralism. For example in our community-based, co-management cases, we found that sanctions might include the customary payment of food or shell money (customary governance), 'bad luck' from forces beyond the human realm (customary and Christian belief systems), or a warning, and a monetary fine (state or NGO-supported governance) (Cohen and Steenbergen 2015). Yet, even in situations where local governance might be considered intact, respected and strong, it is almost inevitable that communities will appeal for enforcement support from the government, particularly for repeated infringements, or infringements by "outsiders" (Govan et al. 2009); illustrating community

perceptions and experiences of the limits to local governability. In situations where tenure is unclear or disputed, self-governance is perceived as "weak" and resource use is intense, particularly when driven by lucrative international markets (i.e., situations that are becoming more common across the Pacific), community-based, co-management may be unviable. In fact, many community-based, co-management efforts fail, but tend to go unreported. In these situations hierarchical governance or greater involvement of the government as a co-management partner may be required to address small-scale fisheries concerns.

Taboos are employed within most Pacific community-based, co-managed systems (Govan et al. 2009), and emerge as a socially acceptable and locally implementable measure with potential to enhance sustainability – something that has largely been untested to date. We used an interdisciplinary approach to examine four periodically-harvested taboos; firstly looking at harvesting dynamics (i.e., fishing effort, gear and method use, periodicity of harvesting) that would affect sustainability, and secondly looking at indicators of fisheries performance (i.e., catch rates, yield, fish length and displacement of fishing effort) for multi-species, multi-method fisheries (Cohen and Alexander 2013; Cohen et al. 2013). We made comparisons between four taboos and 55 nearby continuously-fished reefs. We found total annual effort and catch in taboos was low to moderate compared to reefs continuously open to fishing. When taboos were opened, effort in the area was very intense, but because taboos were only opened for a small proportion of the year total yield did not exceed annual benchmarks of sustainability but nor was it appreciably different from reefs continuously open to fishing (Cohen et al. 2013). Catch rates of invertebrates during openings were significantly improved suggesting that the periods of closure or overall relief from fishing pressure were sufficient to allow some recovery, however we did not find evidence that the strategy had substantially benefited multi-species finfisheries (Cohen and Alexander 2013). While taboos may alleviate fishing pressure in a small area of fishing grounds, it is unlikely they provide substantial benefits to broader fishing grounds. Further, openings of long duration, high frequency and intense exploitation, may lead to unsustainable harvesting within the area. While the instrument *fits* well with the local *governance system*, in many forms its *performance* will be inadequate to deal with all the diversity and complexity of the *system-to-be-governed*.

Can Community Based Management of Small-Scale Fisheries Be Locally Governed in an Equitable and Participatory Manner?

Co-management helps to ensure that benefits from small-scale fisheries remain at the local level, rather than being accumulated by few in more centralized, 'wealth-based' models of management (Béné et al. 2010). While many community-based, co-management initiatives aim to improve community-wide wellbeing, the reality is

that inequitable distribution of benefits or involvement in decision making is not uncommon when initiatives work within customary governance structures (Béné et al. 2009; Cinner et al. 2012). In short, chiefly systems and customary tenure are not built on western ideas of participatory decision-making and equitability. A chief's or clan's propensity for participatory process and equitability are influenced by leaders' and communities' worldviews and characteristics. While customary tenure can be used to *exclude*, it may also be used to build social capital with non-tenure holders by *permitting* them access and use rights (Carrier 1987). Many land and marine areas might effectively operate as open-access, at least for some resources, despite there in fact being a mosaic of different tenure claims. Exclusivity via tenure is more frequently enacted when competition or interest in resources intensifies (e.g., for commercial exploitation or other uses) (e.g., Carrier 1987; Macintyre and Foale 2007). In efforts to build equitable processes and to ensure management instruments (such as those that create exclusive access) are not to the (substantial) detriment of particular people within a community, many community-based, co-management partners promote democratic and participatory processes and structures e.g., resource management committees with representatives from different sectors of society. Nonetheless, tenure is often bolstered and used as a mechanism for access exclusivity (Jupiter et al. 2014). The ability to restrict access is a foundation of effective resource governance (Ostrom 1990). However, this illustrates the wickedness of small-scale fisheries governance (Jentoft and Chuenpagdee 2009); where resources are limited, but people's reliance on resources is high "solutions for one group of stakeholders may cause problems for other stakeholders" (Chuenpagdee and Jentoft 2013, 346).

A key assumption of co-governance is that "no single actor is in control" and that between actors there is some degree of equality (Kooiman and Chuenpagdee 2005, 336). However, in practice power asymmetries may cause governability challenges (Jentoft 2007), and as discussed in the previous paragraph equitable benefit and cost sharing, or involvement in decision making can be problematic when working with customary governance structures (Béné et al. 2009). We found that in some cases community-based, co-management arrangements supported the use of the benefits from harvesting for communal, village-wide purposes, but in other cases decision making and distribution of benefits were based on genealogy or social standing. For example, particular clans benefited from the potentially more profitable early stages of harvesting newly opened taboos, and in the most extreme case benefits of harvests were appropriated largely by particular elites (Cohen and Steenbergen 2015). As competition for resources intensifies, scenarios of "elite capture" or inequitable distribution of benefits may become more common and have greater implications for non-elite or marginal groups. Despite explicit efforts to enhance inclusion of women and other marginalized groups in decision making, males who held traditional leadership roles took the lead in decisions in the cases we examined. In summary, the distribution of benefits and costs, and representation in resource related decision making are highly variable and dynamic depending on local context and the processes employed to establish management. Community-based, co-management

partners face a significant and ongoing challenge to understand and align with local governance and social structures without compromising equitability objectives.

Can Community Based Management of Small-Scale Fisheries Influence, and Be Influenced by, Higher Scales of Governance and Learning?

To differing extents, community-based, co-management interacts with hierarchical governance via (a) government policies and actions that validate, support or undermine community-based, co-management, (b) national fisheries and environment legislation that simultaneously regulate the use of coastal habitats and resources, and (c) mechanisms and structures such as networks that seek to foster learning, institutional support and spread of improved management. Community-based, co-management in Solomon Islands and the Pacific involves interactions between national organizations, and regional and international initiatives and networks. While supporters of co-management place much emphasis on improving management practices at local levels (e.g., Jupiter et al. 2014), there has been less attention on how the institutional and cross-scale governance environments enhance localized outcomes. In this section we consider those cross-scale and cross-institutional interactions that create an environment that enables, constrains or otherwise interacts with community-based, co-management.

The constitutional recognition of customary tenure and governance provide the foundations for community-based, co-management in Solomon Islands. Current environmental (Solomon Islands Government 2009) and fisheries (MFMR 2008) policies recognize and promote a "*people-centred and integrated resource management approach that relies on a core of community based management as a national strategy to improve food security, adaptive capacity and conservation*" (Solomon Islands Government 2009, 9). Even regional scale objectives such as those articulated in the Coral Triangle Initiative[2] are delivered through community-based co-management (Solomon Islands Government 2009). In line with this there have been amendments to recent environmental and proposed fisheries legislation to provide further legal backing. In practice, however, operational budgets of government agencies remain low and do not trickle down to local level engagement or support (Govan et al. 2013a, b). To what extent strengthening legal backing will actually bolster the implementation and enforcement support that communities seek remains uncertain. Where there has been some success is in communities restating some national regulations in their local management plans (Cohen et al. 2013), as a form of 're-regulation' (sensu Chuenpagdee et al. 2013). However, there are also examples where interactions between hierarchical governance and

[2] The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security focuses on six countries (Solomon Islands, Indonesia, Malaysia, Philippines, Papua New Guinea and Timor Leste) based on their exceptionally high marine biodiversity.

community-based, co-management were beyond the control or influence of local governors, and experienced by communities as acute shocks. For example, sea cucumber fisheries had been an important source of cash in an otherwise largely subsistence economy of the community of Kia, and were the focus of Kia's early management efforts. However, in 2006, in response to concerns about overexploitation and resource decline, the government imposed, with very little warning, a national export ban and the 'fishery' ceased to exist. This created substantial hardship in the community until they were able to adapt their livelihoods and their management efforts.

Networks are a prime example of co-governance, providing a platform for deliberation, communication, cooperation and coordination (Kooiman and Chuenpagdee 2005). The Solomon Islands Locally Managed Marine Area Network (SILMMA; comprised of NGO, research agency, government ministry, and local community managers) was explicitly designed to facilitate cross-scale, cross-institutional learning, coordination and local-level representation associated with community-based, co-management (Cohen et al. 2012) – mirroring an option highlighted for improving governability (Kooiman and Chuenpagdee 2005). Solomon Islands' small-scale fisheries is an example of a highly diverse and complex *system-to-be-governed*; for which, it is argued, co-governance is the best suited mode for high diversity (Siry 2006), whereas highly complex systems are better suited to more coordinated, and even centralized approaches (Chuenpagdee and Jentoft 2013). The SILMMA network allowed community-based, co-management initiatives to account for diversity and dynamics at local scales, but simultaneously promoted multi-actor, cross-site learning on fit, responsiveness and performance. The network drew the government into a lead coordinating role, something that is reportedly rare (Kooiman and Chuenpagdee 2005). Yet, in practice, coordination was minimal, and the prime interactions were directly between co-management partners, and communities (Cohen et al. 2012). Durable and meaningful interactions with outcomes of learning and coordination are challenged by both the costs of interaction (relatively rarely recognized in theory, but commonly faced in practice) and by the intangible, but often stated, objectives of 'learning', 'sharing information' and 'coordination'. In contexts defined by high complexity, diversity and dynamism across scales these ideas can be hard for governors to pin down and progress. Further, while the network provided a critical pathway for higher-level representation of local issues in national and international policy arenas, there were still substantial challenges in improving representation and downward accountability (Ratner et al. 2013). Autonomy of stakeholders is an important characteristic of co-governance (Kooiman and Chuenpagdee 2005), but because community representation was financially and logistically reliant on their partners, autonomy to represent community interests may be jeopardized (Ratner et al. 2013).

In addition to national and sub-national interactions, networks can also link community-based, co-management to regional and international partners. The other network that mediates local to national to international linkages is the National Co-ordinating Committee formed in 2009 under the Coral Triangle Initiative. Committee representatives include the environment and fisheries ministries, other

government stakeholders (e.g., Ministries of Development Planning and Aid Co-ordination, Finance, and Provincial Government) and those NGO and research organizations operating nationally for small-scale fisheries and marine conservation. This committee has participated in formulation of regional policy associated with the Coral Triangle Initiative, but has also buffered the impact of this policy by translating it into a national context by developing its own targets and definitions contrary to those outlined in regional policy. For example, the network prioritizes community-based, co-management rather than the pervasive model of permanently closed Marine Protected Areas (Solomon Islands Government 2009). While designed to co-ordinate the Coral Triangle Initiative the National Co-ordinating Committee is increasingly becoming the *de facto* structure through which conservation and natural resource management initiatives are co-ordinated, and as such plays an important role for enhancing the fit of external-supported initiatives to the Solomon Islands context.

Discussion

In this chapter we have used the Interactive Governance Framework to examine governability of Pacific Island small-scale fisheries, focusing in particular on Solomon Islands community-based, co-management. In our discussion we draw out key learnings from our engagement with the framework, and highlight noteworthy aspects of Pacific small-scale fisheries that have emerged from our analysis.

The framework facilitates a novel analysis of Pacific small-scale fisheries in two main ways. First, in examining the *system-to-be-governed* the approach requires assessment of the diversity, complexity and dynamics across scales of both the social and ecological subsystems of the fishery. With these descriptions at hand we were able to analyze the goodness-of-fit, responsiveness and performance of community-based, co-management (as the *governance system*) relative to the *system-to-be-governed*. Our analysis highlighted some relatively unique aspects of governability of Pacific small-scale fisheries. The marine biological and cultural diversity within the Coral Triangle region (in which Solomon Islands is situated) is unmatched. Further, few places retain such extensive customary tenure systems as those in the Pacific that form the foundations of contemporary efforts to establish community-based, co-management. In the past, many places with tropical small-scale fisheries had customary management systems, but many have experienced their erosion or dissolution. For example, in the Philippines customary management is no longer considered a viable foundation of contemporary governance (Aswani et al. 2012). In other cases, a legacy of customary management remains and efforts to resurrect some of these traditional institutions continue e.g., *Sasi Laut* in Eastern Indonesia (Cohen and Steenbergen 2015). Nonetheless, we have shown that even in the Pacific these foundations can offer challenges to equitability in decision making and in the distribution of costs and benefits. The Pacific is rapidly changing through population growth (at a rate among the highest globally),

urbanization and increased market integration. In the Pacific this rapid change is often operating beyond the local scale, but nonetheless presents challenges to local governability of small-scale fisheries.

The second source of novelty in the Interactive Fisheries Governance framework is its explicit focus on three modes of the *governance system* – self-governance, co-governance and hierarchical governance – as interacting rather than as mutually exclusive pathways. In Pacific small-scale fisheries this analytical feature captures the different emphasis on these modes of governance for different parts of the small-scale fishery (e.g., finfish versus higher value invertebrate export fisheries) at different times thus better explaining the evolution of the governance approach, and its effects on increasing or decreasing governability. In Pacific small-scale fisheries community-based, co-management systems are founded on self-governance enabling them to remain culturally relevant and locally governed, however we found that some aspects of sustainability may be compromised. Hierarchical governance plays an important role in protecting high value invertebrate fisheries (which is a gap in self-governing modes), but plays a relatively small part in subsistence fisheries management. So while the community-based, co-management model appears to represent more idealized forms of co-management as outlined in Sen and Nielsen's (1996) spectrum of possible arrangements, in reality the government does not act as a service provider that responds to communities' governance support needs (Govan et al. 2013b). We highlight that in certain circumstances (i.e., where self-governance is weak, resource use is intense etc.) greater involvement of government may be required to effectively increase governability. Further, while mechanisms for promoting cross-scale coordination and learning exist, these are faced with the practicalities of working in diverse, dynamic and complex contexts – particularly in developing countries where there is commonly a deficit of technical resources, finances and capacity.

Conclusion

Within the Pacific region capacity limitations of national governments have meant that the hierarchical mode of governance has been challenged to address small-scale fisheries concerns. Hierarchical governance, throughout the Pacific, has also faced difficulties in reconciling top-down authority with the constitutionally protected rights of local resource owners to govern their own marine resources. Yet, in the face of intensifying pressures on fisheries resources, there have been increasing concerns from local resource users, the state and civil society alike, that the self-governance institutions, even where intact, are not up the tasks of ensuring fisheries sustainability, or realizing contemporary development objectives such as equality and broad participation. The Solomon Islands model of co-governance has similarities with co-governance practices throughout Melanesia and the broader Pacific region, and has emerged from global theory and local context, as the most appropriate model to compensate for the inherent short comings of hierarchical

and self-governing modes. The Interactive Governance Framework allowed us in this chapter to examine the hybridization of traditional and contemporary, local and state models of management and governance. We have highlighted that interactions between co-governance and self-governance modes are fundamental for improving the 'goodness-of-fit' to the community level, being highly diverse and complex on national and regional scales. Localizing governance permits responsiveness to local dynamics, not possible through hierarchical governance. Further, interactions between co-governance and hierarchical governance both bolster and inform local management and governance solutions, and are ultimately anticipated to improve governance performance. Yet, while community-based, co-management (or the co-governance mode) is recognized as an appropriate and necessary mode for governing Pacific small-scale fisheries, it is certainly not without a suite of challenges, and in certain situations will not be up to the task of increasing the governability of small-scale fisheries. To better address these challenges and shortcomings, we recommend that Pacific small-scale fisheries policy and practice more explicitly seeks, and tests, new forms of governance interactions, as they are starting to do with arrangements such as cross-scale governance networks.

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