

Lessons from implementing, adapting and sustaining community-based adaptive marine resource management



Australian Government
Australian Centre for
International Agricultural Research



RESEARCH
PROGRAM ON
Aquatic
Agricultural
Systems

LESSONS FROM IMPLEMENTING, ADAPTING AND SUSTAINING COMMUNITY-BASED ADAPTIVE MARINE RESOURCE MANAGEMENT

Authors

Philippa Cohen, Anne-Maree Schwarz, Delvene Boso and Zelda Hilly

Citation

This publication should be cited as: Cohen, P., Schwarz, A.M., Boso, D., Hilly, Z. (2014). Lessons from implementing, adapting and sustaining community-based adaptive marine resource management. CGIAR Research Program on Aquatic Agricultural Systems. Penang, Malaysia. Lessons Learned Brief: AAS-2014-16.

TABLE OF CONTENTS

Key messages	4
Introduction	5
Community-based management in Solomon Islands	5
Information sources and context	5
Lessons	7
Implementing management in practice	7
Adaptive management	8
The community's ability to govern and sustain management	9
The way forward	12
Notes	14
Bibliography	15

KEY MESSAGES

Community-based marine resource management is recognized by the Government of Solomon Islands as the principle strategy for use in marine conservation and small-scale fisheries management. This strategy is particularly important in Solomon Islands due to the constitutionally recognized customary tenure systems that are in place in rural areas where the majority of the population resides. Many government agencies and non-governmental organizations (NGOs), including WorldFish, provide support to rural communities in their efforts to improve the management of their marine resources. During the last eight years in which WorldFish has worked alongside communities to support the implementation of community-based resource management (CBRM), various lessons have emerged or been reinforced. These lessons represent important considerations for CBRM, and for engaging with and supporting communities.

- CBRM incorporates a suite of resource-use rules and governance arrangements. These arrangements emerge from community-driven deliberations, often with guidance from a support partner. Management arrangements are recorded in management plans that are designed to be 'living' and 'adaptable' guiding documents.
- Differences between planned and implemented management may emerge because of the following:
 - a shift in the external environment (e.g. policy change, a new opportunity)
 - shifts in community priorities
 - difficulties in implementing or enforcing planned measures
 - a requirement for more flexibility
 - learning and new knowledge
 - a response to changes in the status of fisheries resources or the marine environment.
- Implementation of a management plan is supported by strong leadership, sustained community-wide awareness of arrangements and their rationale, sustained community-level involvement and ownership of the management process, and community leaders that can guide management through shocks and changes.
- Tambus¹ are a preferred and commonly used management measure, but additional measures may be required to improve resource sustainability. Management outcomes may be improved if both partners and communities have an improved understanding of the benefits and limitations of various management tools.
- Communities need to address a range of concerns and priorities across all sectors in order to develop their community. Fisheries and resource management must be one of these priorities in order for CBRM to be effective, but CBRM may often compete for people's time and energy with other equally important issues such as community health or education needs.
- Efforts to address fisheries concerns through CBRM may be more effective where it is integrated into planning for broader community development.

INTRODUCTION

The purpose of this brief is to distil lessons from community experience of implementing management plans for community-based adaptive resource management in Solomon Islands.

A summary of key lessons learned from NGOs and other organizations working as partners with communities in developing marine resource management plans was previously published: *Community-based adaptive resource management in Solomon Islands: Lessons learned*. A facilitator's guide to working with communities in marine resource management followed: *Community-based marine resource management in Solomon Islands: A facilitators guide*.

In this brief we focus on the lessons learned from the different stages of: *implementing, adapting* and *sustaining* community-based adaptive marine resource management.

This brief aims to complement lessons learned by other initiatives in the country and through the 'Solomon Islands locally managed marine area network' www.SILMMA.org.sb. This brief makes these lessons available to the people and Government of Solomon Islands, and those working with CBRM throughout the Pacific region.

Community-based management in Solomon Islands

Community-based adaptive marine resource management arises from participatory, collaborative processes where the focus is on local communities managing their marine and coastal resources, with a particular focus on fisheries. This involves a management system in which those who are involved in fisheries take responsibility for implementing management by participating in decision-making on aspects of management; defining access rights; limiting harvesting; practice enforcement and compliance; undertaking monitoring; and periodically reviewing and adjusting management arrangements.

This approach to management is encapsulated by the term: community-based resource management (CBRM). The term CBRM is adopted here for consistency with current policy (e.g. Solomon Islands National Plan of Action; Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security 2009) and to reflect a more holistic approach to fisheries management in accordance with the Ecosystem Approach to Fisheries Management (EAFM). CBRM has been associated with decentralized management approaches, which empower communities to become better stewards of their customary land and sea resources. In a broad perspective, CBRM relates to communities, government institutions and civil society groups that work together to manage resources at the community level.

Information sources and context

These lessons are based on WorldFish collaboration with communities through the ACIAR-funded project: FIS/2010/056 Scaling-out Community-based Marine Resource Governance in Solomon Islands. Primarily, lessons have been drawn from experiences in Western Province, although lessons from Isabel and Malaita were also relevant. They draw on observations made by WorldFish staff whose work focuses on supporting communities to undertake CBRM, and on community perspectives shared at a 2012 workshop of Western Province communities who have been undertaking CBRM for the past eight years, with support from WorldFish. Throughout this document, the symbol † indicates where experiences or lessons were directly raised by communities in that meeting.

WorldFish's approach to CBRM is conceived around a conceptual framework that specifically addresses the challenges that least developed countries face in managing small-scale fisheries (Figure 1). This framework provides broad guidance on the various stages of working with a community to understand its particular context, and support the implementation of appropriate management – the framework highlights important considerations within each of those stages.

We focus here on experiences of supporting the implementation of community-based adaptive marine resource management (indicated by the dark box in Figure 1). Support partners, such as WorldFish, commonly provide guidance in community-led processes to form management arrangements that suit the community context and address their fisheries concerns (Boso et al. 2010). The lessons and recommendations presented here relate to *implementing, adapting and sustaining* community-based adaptive marine resource management. These lessons are not necessarily new, but they represent important ongoing considerations for CBRM, and for engaging with and supporting communities.

Consultative processes lead to the negotiation and formation of community-appropriate and informed management arrangements. These arrangements are often represented in written management plans. Subsequently, the implementation of management arrangements usually falls to communities. This refers to the implementation of rules and the activation of governance institutions – or when a management plan comes alive.

WorldFish, and many other partners in community-based management, promote *adaptive* resource management, which emphasizes the adjustment of management as situations change or as there is learning by the community managers. Over time, knowledge is generated which can guide adjustments to management in a bid to improve the performance of management for reaching the desired objectives.

Sustainable management is necessary for long-term fisheries goals - more food and improved livelihoods - to be realized. This emphasizes the importance of having resilient management institutions i.e. those that can absorb disturbance or shocks, and change, while retaining the same functions and structure. In other words, even if community managers face significant challenges or changes, efforts to manage the resources will continue.

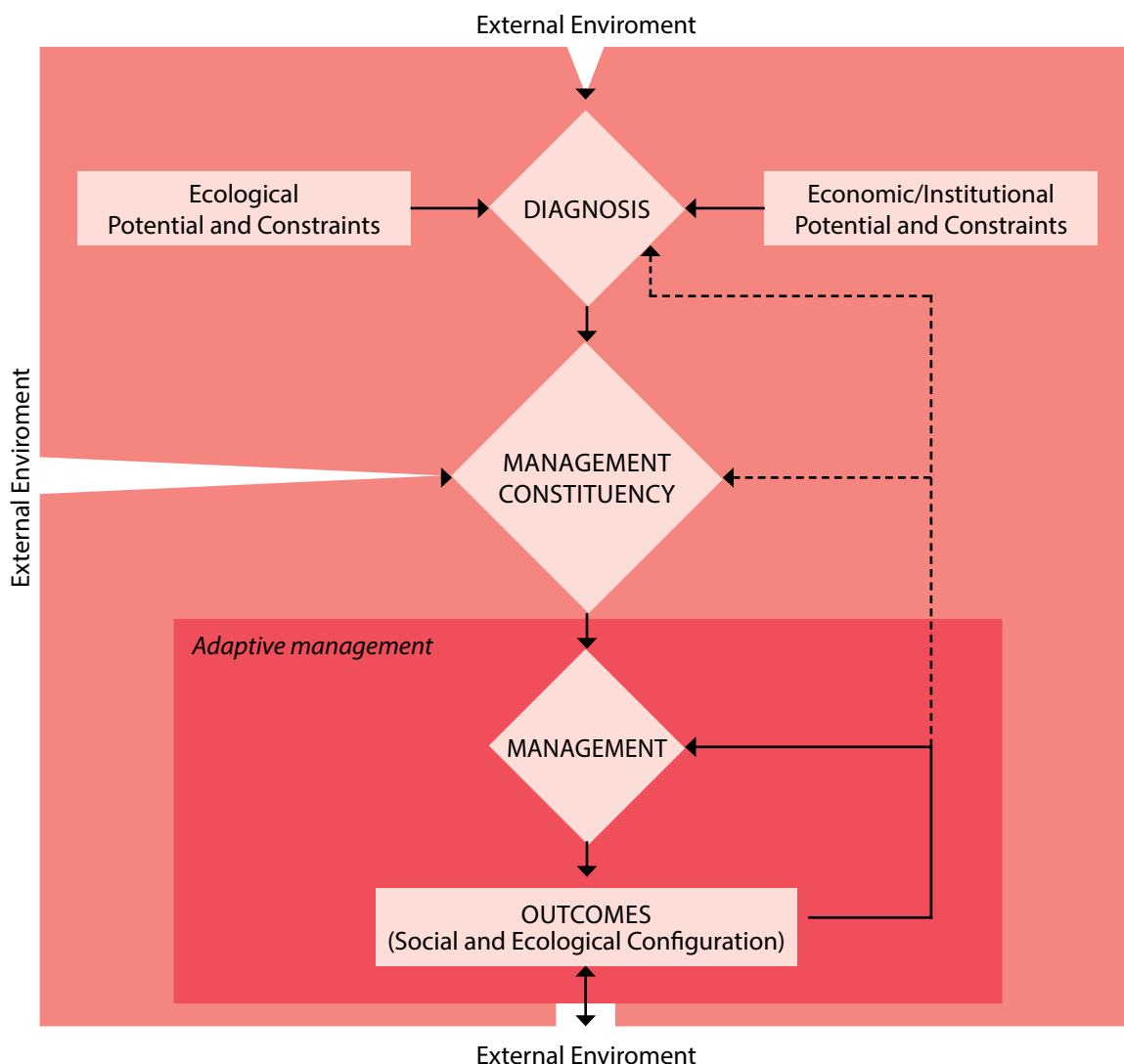


Figure 1: Participatory diagnosis adaptive management framework: A conceptual scheme for the diagnosis and management of small-scale fisheries (Andrew et al. 2007)

Implementing management in practice

Tambus¹ are the most commonly used rule applied to resource use, but additional measures may be required to improve resource sustainability

In the management planning phase of CBRM, a suite of resource-use rules emerged from discussions between communities and their partners. The resultant management plans cover a range of resource-use controls such as: size limits, gear restrictions, access controls, species bans and closed areas. Tambu areas, which reflect traditional customary practices of closing reefs, are a common CBRM resource-use control measures (Cohen and Foale 2013).

At implementation phase, tambu areas are the most common, and in some case *the only*, resource-use control used. Despite identification of the need for rules and controls such as: size limits, gear restrictions or the area of open fishing grounds, these appear to be harder to implement (Cohen et al. 2013). Nationally legislated resource-use rules, in particular trochus (*Trochus niloticus*) size limits and the ban on harvest-for-export of sea cucumber are two exceptions. Fishers can be reluctant to harvest undersized trochus, as village-level buyers will not buy them because exporters will face difficulties exporting undersize trochus due to government enforcement of export size limits. However there are cases where national regulations are not so effectively implemented in community fisheries. For example, communities often choose to reinforce the national regulation on net mesh size in their management plan, but as this regulation is not enforced nationally at the point of import, community enforcers are unable to enforce it within their fishing grounds.

Building strong and effective CBRM can take time. While communities may successfully implement components of management or some resource-use rules (such as tambus) early on, it can take longer to create the right conditions for implementing the suite of management measures that will be necessary to achieve broad and lasting fisheries benefits.

Monitoring activities must be simple, reliable and cost-effective, and have community interest

Communities are interested in monitoring the biological or ecological outcomes of their management. Many partner organizations have learned that underwater counts of fish and/or invertebrates can be carried out by trained community members. However, community representatives continue to request financial and technical support to conduct this type of monitoring† and when support is ‘project based’ and finite this is not a sustainable option. We have found that some community representatives can, with training, self-sufficiently sustain low intensity and simple catch monitoring where they use catch per unit effort data to monitor the results of management. Other communities and fishers tend to use perceptions or ‘expert observation’ techniques, whereby fishers consciously use their intimate knowledge and regular exposure to fisheries to assess any changes.

Management spanning multiple villages may have advantages, but specific management rules and governance arrangements may, in many cases, be best devolved to the village level

Villages may prefer to work as a region, where multiple villages (usually between 3 and 5) form a regional unit because of a historical connection. Developing and implementing management by region (as opposed to management by village) may hold several advantages in terms of facilitating processes and outcomes. Working at the region level can extend management over a larger area. A regional management arrangement draws on natural social alliances that may facilitate the sharing of lessons, experiences and technical resources to support implementation. From an ecological perspective, managing a region or establishing a network of managed or protected areas can enhance the effects of management or protection because of larval dispersal and adult migration from neighboring, well-managed sites.

While villages within a region may appear, upon initial assessment, to have broadly similar management issues and external environments, as the management process proceeds, the differences in management needs, governance arrangements and shocks or changes faced emerge. Different villages can be at different stages along the management process and some villages may face problems in implementing or sustaining management.

In our experience, managing at a regional (multi village level) can be challenging, and can slow or hinder adaptation. The logistical difficulties of travel in Solomon Islands can make it expensive and difficult for representatives from across a region to come together for discussions – and meetings may be dependent on the availability of external financial support. In some cases, this challenge has appeared to slow the reassessment and adaptation of management arrangements.

Additionally, adaptations may be quite different in the different villages that have been trying to work together as one management unit. We have observed that communities that were more advanced in the management process could serve as a positive example and share lessons with communities that were less advanced. In other cases, if some communities were having problems in implementing management, this may have slowed the progress of other communities. Cross-community lesson-sharing may be useful at regional levels. However, specific management rules and governance arrangements may, in many cases, be best devolved to the village level – allowing rapid responses to change in a specific context.

Community to community exchange is popular and can be effective for promoting CBRM

Communities can learn from the experiences of others – word of mouth can stimulate other communities to implement CBRM (Abernethy, in review). This process of learning can be facilitated through structured ‘look and learn’ activities i.e. where NGO or government partners provide financial and logistical support to community representatives to visit another location where CBRM is operational, and there they participate in a structured program of learning. However the exchange of information and ideas about CBRM can also happen more naturally through family and market relations in particular (Abernethy, in review).

Adaptive management

Rules, norms and processes that are encapsulated in a written management plan tend to differ from those that are actually implemented

In a CBRM approach, management plans emerge from community discussions and deliberations, often with guidance and support from partners such as WorldFish. Despite making concerted efforts to have broad and inclusive consultative processes in the formation of management plans, we have found that management implemented by communities often differs from the arrangements originally decided upon and laid out in management plans. In other words, the rules on paper differ from the rules in use. There are three main ways in which this happens:

Failed implementation or enforcement

In certain cases the rules that communities hoped to implement and enforce were found to be unworkable. This was due to insufficient awareness in the broader community about the nature and the reasons behind resource-use rules† and/or resistance from the broader community or sectors of the community to following particular rules.† For example, some communities wished to ban nets or night spear-fishing, but in practice it was found to be difficult or impossible for these rules to be effectively implemented.†

The need for more flexibility than originally anticipated

In Solomon Islands, resource owners and users are accustomed to some degree of flexibility in accessing and using resources, such as the opening and closing of tambu areas. Tambus are area closures that are closed to manage or ‘save-up’ resources and are often opened when a community or the particular clan that holds tenure has a social or economic need to harvest. We have found that some communities commit to a few harvest events in their management plan, but as needs arise, they open areas more frequently than they had planned, to meet those needs (Cohen et al. 2013). As pressures on resources rise due to commercial markets and population increases, there is an increasing need to find a balance between allowing a tambu area sufficient relief from fishing pressure for stocks to rebuild, while still meeting the needs of the people.

Adaptation

Adaptation is a conscious reassessment and adjustment of management according to new circumstances. This is an explicit intent of *adaptive* co-management. In practice, some communities have modified their management rules, governance arrangements or monitoring strategies as circumstances change and according to what they learn as time goes on. For example, changing the length of time that a tambu is closed, or choosing to make a temporary tambu a permanent closure.

In the CBRM approach that WorldFish has supported, it was envisaged that regular (i.e. annual), structured (i.e. assessment against management plans and objectives) and formal (i.e. involving committee representatives, village leaders and resource owners) meetings would be useful for review of the management arrangements. However such management reviews have rarely been carried out independently by the communities. Additionally, adjustments to management (such as increased flexibility of tambu openings) are not always made in relation to the longer-term objectives that had been identified in the management plans. Rather they tend to be responses to shorter-term needs. This highlights that management will frequently involve a compromise between long- and short-term objectives and needs.

Changes or shocks at the village level can interfere with management, particularly if they are unanticipated and not planned for

Over time, communities face changes or shocks (e.g. infringement of the rules, conflict in the village, opening of a managed area) that can lead to difficulties in returning to the level of management implementation that they had achieved prior to the change.† Sustaining management requires management institutions (rules and governance arrangements) to be resilient i.e. able to absorb disturbance or shocks, and change, while retaining essentially the same functions and structure (Andrew et al. 2007). We have learned that communities must be prepared for these shocks, as they are the norm, not the exception. At the management planning stage, discussing potential shocks and working through scenarios of response may assist communities in their responses and

adaptation approaches. Some communities are more resilient and can more easily return to pre-shock levels of management, and there are lessons to be learned from these scenarios.

Issues related to resource ownership can arise at any time, and may stall management efforts if unresolved

It is critical to consider resource ownership and rights to resources when forming management plans (Boso et al. 2010). In forming management arrangements, communities must come to an agreement over who has the right to make management rules about different areas. Despite these consultations and clarifications, communities often find that when implementing management, issues related to resource ownership and rights can still arise.

Similar to the experiences of others working in Solomon Islands, we find that increased interest in an area (e.g. for increasing access or use restrictions for management purposes, or due to increased commercial interest in resources within an area) tends to highlight concerns about rights and ownership that may have not been at the surface before. Initial queries about ownership may not uncover these complexities; they may arise in response to the changes, such as those caused by implementing management. While the risk of this may be reduced by effective consultations in the development of management approaches, we appreciate that this will still be a shock that communities will experience and need to anticipate, or even prepare for.

The community's ability to govern and sustain management

The ability to enforce rules varies amongst communities

Within CBRM, the formation of rules and their enforcement are both necessarily community-driven processes, and the responsibility for these often falls to clans holding tenure, chiefs and/or the resource management committee (where one has been established). Management rules are more easily enforced when leadership is strong† and when leaders are proactive in publicizing and enforcing their management plans. Management rules are more likely to be respected if they do not cause undue hardship to certain groups of people e.g. women.

However in some situations, communities face difficulties in enforcing the rules. When the rules have been infringed by a person or people who are from a clan that has ownership rights to that particular area, it is difficult to enforce the rules.† These are people that have historical, customary rights to access those resources and despite broad consultations prior to implementation of management, they either do not agree with the increased restrictions placed over the resource, or they agree in principle, but expect exceptions to be made for them.

Communities also find difficulties in enforcing their management rules when those infringing rules are from outside of the village†. This is not a pressing issue for all communities. However, where this is a concern, we have found that community requests for legal reinforcement of management plans and assistance with enforcement are particularly strong.

Innovative approaches may improve broader involvement in decision-making

CBRM emphasizes broad involvement in decision-making (especially involving resource-owners, the church, women and youth). The principles of CBRM engagement for Solomon Islands (Boso et al. 2010; Alexander et al. 2011) imply that where there is emphasis on considering the opinions of women and youth, as well as men, there will be greater community understanding, ownership and commitment to management plans. In many places the church plays a very important role in decision-making and inclusion of the church may facilitate support for management plans and rules.†

However, messages do not necessarily travel well within a community. A common communication channel is to work most closely with chiefs, resources-owners and a management committee (where one has been established). This can mean that communication is targeted at these focal points (due to resource limitations and a requirement for efficiency), who have the responsibility to share messages with the broader community. However, in some instances updates do not reach the broader community from these focal points.†

The effectiveness of focal points depends on the characteristics and commitments of these particular people. To account for potential

problems with relay or redistribution of information from focal points, using a diversity of mechanisms and will help media better ensures effective and sustained information exchange. Additionally, it may be beneficial not to assume information has traveled well through community via the focal-point strategy.

The processes of consultation and communication that lead to involvement in decision-making and sustained involvement in management may be best facilitated by using existing community groups† (e.g. women's groups, youth groups etc.). To date we have observed enhanced interest in the management planning process by engaging with women's groups separately from the men's groups, as well as using mixed forums. The role of women in decision-making about resource use can be enhanced through consultation and education processes facilitated by partners that support community-based management (Hilly et al. 2007). Where fishing is a primary livelihood for male youth, some of whom may be excluded from mainstream community church groups, this sector of society is sometimes overlooked and excluded from decision-making about management. In some instances youth 'champions' within a management committee have made considerable efforts to ensure that youth are actively engaged in management activities. However, ensuring effective sustained engagement of youth with their management plan remains a challenge.

We emphasize that this lesson refers to mechanisms for *more effective* consultation and engagement, as opposed to *more* consultation.

In some communities, approaches for empowerment and strengthening governance may help sustain CBRM

Where leadership is weak or ineffective (such as in enforcing and publicizing rules) CBRM is unlikely to be implemented or sustained. Communities differ in their leadership situations and in their ability to work together. Some communities feel that their village leadership has been too weak and ineffective to support the implementation of management.† Communities may need support to build and strengthen their leadership and other aspects of governance for successful CBRM implementation.

Some communities that have implemented CBRM with WorldFish as partners have noted that it has taken some years to fully understand that they have the right and knowledge to manage their own resources – and that responsibility does not rest with external agencies such as the national government or NGO partners. For example, at the review of their management plan one resource-owner and manager said, “Now we understand what WorldFish mean when they said that the management plan belongs to us, and if we want to change the management, that is up to us”. While this may reflect the community’s internal governance arrangements and previous experiences with projects, finding ways to empower communities to plan and determine their own future, and feel ownership of the process at an early stage of engagement, can be just as important as the decisions about which rules to implement. To further promote community ownership, we have modified the elements of our engagement processes, such as reducing the length of the management plans (Boso et al. 2010).

There are important roles for the government to play in supporting CBRM

Collaboration and communication between government authorities and communities is important since management of marine resources is the responsibility of the national and provincial governments, and resource-owners. Involving provincial and national fisheries staff in CBRM which is being supported by an external organization, allows them to gain the necessary experience to interact effectively with communities and can help community perspectives reach higher levels of governance and planning (Cohen et al. 2012). At the receiving end, communities often ask for government involvement† and appear to be appreciative when national and provincial governments are aware of what they are doing.

At this stage, a lack of resources limits the support that provincial and national government can offer on the ground to communities. National and provincial governments do have an interest in supporting rural communities, and see CBRM as a key strategy for national conservation (Solomon Islands Government 2009) and fisheries management (MFMR 2008).

Communities have competing priorities that can affect their ability to implement or sustain CBRM

Competing priorities within a community can slow down and sometimes halt CBRM. The need for cash places a lot of pressure on communities when they try to manage marine resources for their daily needs. Communities need to make difficult decisions about where their priorities lie for the use of their resources, and this can vary between short-term economic gain and longerterm resource sustainability. While recognizing its importance, marine resource management is not necessarily the main or the most pressing concern of communities. Community members have busy schedules, filled with family commitments, gardening for food, church and other community commitments (e.g. school)†. Understanding the broader context and priorities of communities forms a basis for understanding their concern about, and ability to engage in, marine resource management. The priority for managing marine resources must rate high in the list of overall community priorities in order for CBRM to be effective.

The busy daily lives of community members means that implementing and sustaining management can be achieved with reasonable (i.e. not excessive) investments of time (i.e. not so much so that it is a burden) and this reiterates the importance of simple management processes and plans. In appreciation of the broad range of concerns, issues and priorities that are held by communities, WorldFish has a renewed focus on inter-sectoral engagements at the community level.

These lessons reinforce the importance of previous lessons learned in forming management plans (Boso et al. 2010). The work that WorldFish has done on CBRM to date has been premised on an action research approach: learning-by-doing in partnership with communities in order to learn how to do CBRM better. The lessons presented here are not necessarily new, but they represent important ongoing considerations for CBRM, and for engaging with and supporting community development. The lessons that have been reinforced or learned are encapsulated in the two lessons learned documents and provide an opportunity to inform the way forward for working with communities to improve resource management and community development.

Implementing management in practice

The first four lessons presented here focus on implementing management and emphasize the importance of continuing to better understand and improve resource management as it is applied in practice. This is a focal area of ongoing research in which WorldFish works with local communities and stakeholders as co-researchers.

Throughout the Pacific, tambus are a popular management tool and in some cases they may have some benefits for fisheries. Yet a range of factors (e.g. the growth rates of species, how heavily they are fished, when they are opened, how long they are closed etc.) will affect whether tambus can improve the sustainability of fisheries (Cohen and Foale 2013). Partners can provide better support and advice if they understand these factors, and management outcomes may be improved if partners and communities have a good understanding of the benefits and limitations of various management tools. To enhance resource sustainability, communities may be encouraged to monitor (through quantitative or qualitative observation) resource status and availability, and to adapt harvesting patterns accordingly.

Additionally, there is a diversity of management tools that can (and in many cases, should) be applied by communities to address issues or reach different objectives (Jupiter et al. 2014). In supporting the development of management

plans, partners and communities can match different tools to different issues or objectives. For those communities that are implementing some forms of management (e.g. tambus) they will already have the foundations on which to build more comprehensive management arrangements.

Adapting management

Three of the lessons presented here relate to changes to planned management. Adaptation is important to ensure that management responds and remains effective as the local community context changes, and as new knowledge comes to light about the effectiveness and suitability of different management measures. However, in our observations to date, adaptation that results from conscious reassessment and readjustment, while considering broad community objectives, has been limited. To promote effective *adaptive management*, partners can continue their role in providing advice and information to inform ongoing decision-making processes. In addition, partners may support communities to prepare for change that will inevitably challenge their management. This entails a greater emphasis on strengthening governance and building the resilience of management institutions.

A community's ability to govern and to sustain management

The final five lessons presented here are based on themes of governance, ownership, empowerment and community priorities. Responding to these lessons can mean a change in engagement processes (i.e. the way partners work with communities) and an increased emphasis on processes that seek to improve governance. Since 2012, WorldFish's work had been influenced by the CGIAR Research Program on Aquatic Agricultural Systems (AAS; <http://aas.cgiar.org/>; Apgar and Douthwaite 2013). Specifically this has meant a move toward an explicit *research in development* approach that is built on the belief that rural people have the potential and resources to bring about positive change in their lives. The premise is that this can be achieved through participatory action research (PAR), which empowers local communities and strengthens their capacity to harness the farming, fishing

and livestock potential of AAS. There is a strong focus on strengthening governance, building the adaptive capacity of communities to respond to changes and shocks, and increasing their capacity to innovate and progress development. The AAS program has a long-term commitment to work with local communities and stakeholders as co-researchers (a distinctive quality of participatory action research).

In our efforts to support and strengthen community-level governance, we seek to understand aspects of representation, accountability mechanisms and distribution of authority (Ratner et al. 2013). While it can be appropriate and necessary to work with existing governance structures and community groups, these structures may not capture the voices or needs of all community residents. In situations where this is recognized, engagement with communities may need to include explicit efforts to support opportunities for marginalized groups (which may include all, or some, of the women and youth) to be represented and included in decision-making and opportunities related to natural resource management and community development.

In 2013, a community planning approach to identify community priorities for participatory action research was implemented by the AAS program in Solomon Islands. Through a facilitated process, community members agreed on a common vision across all the sectors of concern and interest, assessed their situation, prioritized, set targets, planned actions and set their own indicators. The community then took action, measured their progress and learned how to improve their processes and outcomes. As time goes on, communities will be supported to share and learn amongst themselves and with other communities. While not restricted to CBRM, the process considers all priorities a community might have, and has clear alignment and synergies with the process of implementing CBRM. It potentially has the advantage to allow communities to clearly identify where in their priority list CBRM lies, and what resources they can commit to the CBRM process, and when. Updates of this work can be found at <http://aas.cgjar.org/>.

NOTES

- ¹ Tambus are based on historical or customary practices, and are often non-permanent closures placed over areas of reef or coastal waters to 'save-up' or replenish marine resources. In many contemporary contexts, tambus are closed to harvesting for a period of time, or closed indefinitely until a need for resources arises.

BIBLIOGRAPHY

Abernethy K., Bodin O., Olsson P., Hilly Z., Schwarz, A. (in review) Two steps forward, two steps back: The role of innovation in transforming towards community-based marine resource management in Solomon Islands. Submitted to *Global Environmental Change*.

Albert, J., Schwarz, A., & Cohen, P. (2013). Community-based marine resource management in Solomon Islands: A facilitator's guide. CGIAR Research Program on Aquatic Agricultural Systems (Vol. AAS-2013-17). Penang, WorldFish. Pp. 50. <http://aas.cgiar.org/publications/community-based-marine-resource-management-solomon-islands-facilitators-guide#.Uw>

Alexander T, Manele B, Schwarz A-M, Topo S, Liliqeto W. (2011). Principles for best practice for community based resource management (CBRM) in Solomon Islands. Honiara, WorldFish. Pp. 14.

Andrew N., Béné C., Hall S.J., Allison E.H., Heck S. and Ratner B.D. (2007). "Diagnosis and management of small-scale fisheries in developing countries." *Fish and Fisheries* 8:277-240.

Boso, D., Paul C., Hilly Z., Pita J. (2010). Community-based adaptive resource management in Solomon Islands: lessons learned. Pp 12. WorldFish, Honiara. http://www.worldfishcenter.org/resource_centre/WF_2661.pdf

Cohen, P., Cinner, J., Foale, S. (2013). "Fishing dynamics associated with periodically-harvested marine closures." *Global Environmental Change* 23:1702-1713.

Cohen, P., Evans, L., Mills, M. (2012). "Social networks supporting governance of coastal ecosystems in Solomon Islands." *Conservation Letters* 5:376–386.

Cohen, P.J., Foale, S.J. (2013). "Sustaining small-scale fisheries with periodically harvested marine reserves." *Marine Policy* 37:278–287.

Hilly, Z., Schwarz, A.-M., Boso, D. (2011). "Strengthening the role of Women in Community Based Marine Resource Management: Lessons learned from community training workshops." *SPC Women in Fisheries Information Bulletin* 22:29-35.

Jupiter, S.D., Cohen, P.J., Weeks, R., Tawake, A., and Govan, H. (2014). Locally-managed marine areas in the tropical Pacific: Diverse strategies to achieve multiple objectives. *Pacific Conservation Biology*.

Ministry of Fisheries and Marine Resources (MFMR). (2008). Solomon Islands national strategy for the management of inshore fisheries and marine resources. Ministry of Fisheries and Marine Resources, Honiara, p. 7.

Ratner, B.D., Cohen, P., Barman, B., Mam, K., Nagoli, J., Allison, E.H. (2013). "Governance of aquatic agricultural systems; analyzing representation, power and accountability." *Ecology and Society* 18:59.

Solomon Islands Government. (2009). Solomon Islands National Plan of Action; Coral Triangle Initiative on coral reefs, fisheries and food security. Ministry of Environment Conservation & Meteorology, Ministry of Fisheries & Marine Resources, Honiara, p. 58.



This publication should be cited as:

Cohen, P., Schwarz, A.M., Boso, D., Hilly, Z. (2014). Lessons from implementing, adapting and sustaining community-based adaptive marine resource management. CGIAR Research Program on Aquatic Agricultural Systems. Penang, Malaysia. Lessons Learned Brief: AAS-2014-16.

The CGIAR Research Program on Aquatic Agricultural Systems is a multi-year research initiative launched in July 2011. It is designed to pursue community-based approaches to agricultural research and development that target the poorest and most vulnerable rural households in aquatic agricultural systems. Led by WorldFish, a member of the CGIAR Consortium, the program is partnering with diverse organizations working at local, national and global levels to help achieve impacts at scale. For more information, visit aas.cgiar.org.

© 2014. WorldFish. All rights reserved. This publication may be reproduced without the permission of, but with acknowledgement to, WorldFish.



Contact Details:
CGIAR Research Program on Aquatic Agricultural Systems
Jalan Batu Maung, Batu Maung, 11960 Bayan Lepas, Penang, MALAYSIA
www.aas.cgiar.org

Photo credits: Front & back cover, Anne-Maree Schwarz/WorldFish



**100%
RECYCLED**

Paper made from
recycled material

With communities, changing lives



Australian Government
Australian Centre for
International Agricultural Research



RESEARCH
PROGRAM ON
Aquatic
Agricultural
Systems