

Scaling and sustaining local marine conservation

A Resource Kit for Madagascar

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beyond conservation

MIHARI
Locally-Managed Marine Area- Madagascar Network

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Preface

Traditional small-scale fisheries are critical to the livelihoods and food security of hundreds of millions of people worldwide. Yet marine ecosystems and the fisheries they support are facing unprecedented pressures from overfishing and climate change. 90% of global fish stocks are either overfished or fully fished, and at least \$50 billion is lost every year through mismanaged fisheries.

This fisheries collapse represents a critical challenge at the nexus of food security, poverty and biodiversity conservation, and has prompted greater interest in alternative forms of management, particularly those which place responsibility in the hands of local resource users.

Locally Managed Marine Areas (LMMAs) are areas of ocean managed by coastal communities to help protect fisheries and safeguard marine biodiversity. LMMAs encompass diverse approaches to management and governance, and their sizes and contexts vary wildly, but all share the common theme of placing local communities at the heart of management. From as far afield as Fiji, Kenya and Costa Rica, LMMAs have proven highly effective in reducing local conflicts over fisheries, conserving marine biodiversity, and improving catches.

At Blue Ventures, we've spent the last decade working with communities in Madagascar and the Indian Ocean Region, supporting them to establish LMMAs to help protect the marine resources upon which their livelihoods depend.

This Resource Kit distills 10 years of learning into a series of practical guides covering how to establish and maintain successful LMMAs in Madagascar. Aimed at NGOs and community leaders, it is designed as a living document that can be easily changed as the context in Madagascar changes, or new information comes online and new experiences are shared. Comments, feedback, case studies and examples are welcomed.

No two LMMAs are the same, of course. Since contexts differ from village to village, there is no one way to right way to set up and sustain an LMMA. But there are certain processes, tools and techniques that we've found can increase the chances of a successful outcome. You'll find these, and more, described in the pages that follow.

About Blue Ventures

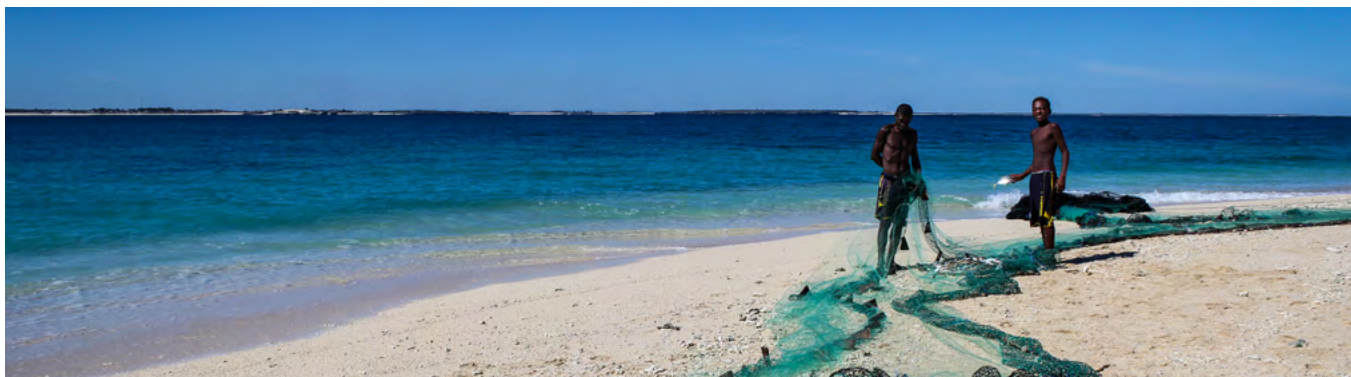
We rebuild tropical fisheries with coastal communities.

Blue Ventures develops transformative approaches for catalysing and sustaining locally led marine conservation. We work in places where the ocean is vital to local cultures and economies, and are committed to protecting marine biodiversity in ways that benefit coastal people.

Our conservation models are designed to demonstrate that effective management improves food security and makes economic sense. We've created the largest Locally Managed Marine Areas (LMMAs) in the Indian Ocean, proven new models for community-led fisheries management, built sustainable aquaculture businesses, and developed effective approaches for integrating community health services with marine conservation. Our award-winning ecotourism social enterprise provides year-round sustainability and match funding to enhance the impact and stability of our field programmes.

Over the past decade our models have guided national fisheries policy and been replicated by fishing communities, NGOs, businesses, donors and government agencies along thousands of miles of coastline. So far our work has impacted the lives of more than 150,000 coastal people.

We're looking for new partners to help us take these innovations to new communities, new countries and new fisheries. To learn more about the benefits of working with us, or to discuss partnership opportunities, please contact



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Introduction

How to use this Resource kit

1. Why Local Management?

2. Marine Management in Madagascar

3. LMMAs in Madagascar: A Background

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How to use this Resource Kit

This Resource Kit provides practical guidance in setting up and maintaining Locally Managed Marine Areas (LMMAs). The Resource Kit is aimed primarily at technical partners that assist communities with implementation, but is also designed to be accessible by community members trained in LMMA implementation. With a focus on Madagascar, practical experience and case studies from the field are used to present user-friendly 'How to' guidance at each stage of LMMA creation.

Divided into five stand-alone sections, the Resource Kit begins with a general introduction to local management and the situation in Madagascar. A simple flow chart is then presented to outline the four key stages of setting up an LMMA:

1. Initial Assessment
2. Planning and Design
3. Implementation
4. Ongoing Management

Each of these stages is presented as their own individual, stand-alone chapter that provides detailed guidance on processes specific to that stage of LMMA creation.

The Resource Kit is designed as a process – a set of practical steps – that the reader can follow to help set up and sustain successful LMMAs. Each section contains a blend of practical exercises, with frequent case studies outlining experience from the field, as well as links to useful resources and existing best practice guidance. As a living document, the Resource Kit will be updated as experience and best practice with LMMAs evolves.





1. Why Local Management?

1.1 Community-Based Resource Management

Natural resources are of vital importance to the livelihoods of millions of people across the world [1]. Traditionally, the management of such resources has been driven by top-down initiatives that do not always account for the rights and needs of local resource users. However, many developing countries often have limited means at the government level to address natural resource issues in rural and remote settings. This, coupled with continued global biodiversity decline, has led to increased interest in alternative styles of natural resource management.

The exclusion of local resource users in management decisions has been criticised as being counter-productive to meeting management aims, and diverse experiences worldwide have shown that local resource users can create institutions to manage their own resources sustainably over time [2]. In recent decades there has been a marked shift in natural resource management, from traditional 'top-down' forms of centralised management towards more 'bottom-up' and inclusive management in which authority is devolved to local resource users [3].

Community-Based Natural Resource Management (CBNRM) is an umbrella term that describes this devolved resource management authority from the state to local users. Across marine, freshwater and terrestrial systems different models of CBNRM exist, with communities either solely responsible for resource management or engaged in collaborative partnerships with government and/or non-state actors.

Communities vary widely both between and within countries, with different cultural, economic and political conditions influencing their nature. However, close examination of CBNRM has identified common factors that help to improve the success of the management approach, with the importance of local leadership, social cohesion and participation in management emphasised [4,5]. However, communities do not just vary between locations but also within themselves, and it is vital that these differences are acknowledged in CBNRM for it to work. Communities are heterogeneous and constantly in flux, being made up of different people at different times, with different interests and differing influence on decision-making [6–8]. Thus, for CBNRM to be most effective, it is important that it is founded on meaningful engagement and participation of all local stakeholders.



1.2 What are Locally-Managed Marine Areas (LMMAs)?

LMMAs are a style of CBNRM they represent a collaborative effort by fishers to manage their community's fishing ground, either on their own or with the support of a non governmental organisation (NGO). LMMAs are **'for the community, by the community'**, and can be defined as:

“An area of nearshore waters and coastal resources that is largely or wholly managed at a local level by the coastal communities, land-owning groups, partner organisations, and/or collaborative government representatives who reside or are based in the immediate area” [9].

Typically run by a village association with representatives from all concerned fishing villages, LMMAs put decision-making powers in the hands of resource users themselves, allowing fishers develop more sustainable use of their own fishing grounds using both traditional and modern management practices [9]. They accomplish this through a variety of management techniques, including gear restrictions, temporal closures, and permanent reserves. The bottom up approach incorporates indigenous knowledge of fishing, and takes into account community needs, making it particularly well suited for a country whose traditional fishing sector and local markets vary considerably from area to area.



2. Marine Management in Madagascar

Situated in the Indian Ocean, off the coast of east Africa, Madagascar is the fourth largest island on earth. Nearly 80% of the country's flora and fauna are endemic, making Madagascar's biodiversity unique the world over. The country is home to one of the largest reef systems in the Indian Ocean, with over 2,230km² of coral reefs underpinning Madagascar's small-scale traditional fisheries [10]. It's marine ecosystems boast huge diversity, from sea grass beds, mangrove forests, islands, estuaries, and coral reefs, and are home to a number of extraordinary and rare species such as dugongs, sawfish, and sea turtles.

2.1 Biodiversity hotspot under threat

Madagascar's rich biodiversity is declining, driven by demand for natural resources such as timber and fish, and land use change. In the past fifty years, Madagascar's forest cover has shrunk to a fifth of its original size, 87% of its coral reefs have been classified as threatened, and 83% of Madagascar's endemic species have made it onto the IUCN's Red List [10,11]. As commercial demand rises, nearly every fishery in Madagascar has become overfished, posing serious problems for the island's food security. Subsistence fishers are highly dependent on coral reef fisheries, and fish is the primary source of protein for 99% of households in the remote regions of the southwest of Madagascar [12].

Compounding the issue of Madagascar's biodiversity decline is the country's high level of poverty, with a lack of alternative livelihood options preventing fishers from switching to other income sources as fishing incomes decrease. This issue of poverty is compounded by Madagascar's rapid population growth, with increasing demand placing increasing pressure on marine resources. Fishers typically live in extremely isolated areas with limited access to markets, schools, social services, and limited economic opportunity. In an attempt to find more productive fishing grounds, many fishers are seasonally migrating along the coast or to offshore islands [13]. Added to these problems is the limited capacity at the national level to effectively manage the exploitation of near shore fisheries.

In response to these factors, communities across Madagascar have begun to develop alternative management systems that are less reliant on government enforcement capacity. With support from technical partners – often NGOs – communities have organised the management of their own resources and the model has spread. Currently, as of 2015, over 65 different LMMA initiatives exist across Madagascar.





3. LMMAs in Madagascar: A Background

Madagascar's LMMA movement began in 2004 in the southwest, with a single octopus closure in Andavadoaka. The community decided to close a small section of their octopus gleaning grounds for six months in order to allow stocks to replenish themselves. Octopuses are well-suited for short-term reserves because of their short growth cycles, and they are important to fishing communities because of the commercial value they represent in local and export markets. The pilot fishing grounds closure was successful, producing substantive financial benefits at the village level.

3.1 Madagascar's first LMMA

The economic benefits, combined with the simplicity of the model, sparked interest amongst neighbouring villages, whose fishers had observed declines in octopus landings from their reef flats. The closure was replicated successfully in many neighbouring villages, culminating in the development of Madagascar's first LMMA, known as Velondriake, which means 'to live with the sea' in Malagasy.

Velondriake spans 25 villages and is run by a committee of elected village representatives that spearhead fisheries management in their communities, choosing reserve sites, the length of reserve closures, and the methods of enforcement. Velondriake is supported by the NGO Blue Ventures Conservation, which provides technical support and collects landings data to help evaluate the impacts of closures.

Velondriake, like many LMMAs in Madagascar, incorporates traditional elements of local management through a Dina, a type of community-based law that is recognized in regional courts.

To create a Dina, communities decide upon rules and appropriate sanctions for violating them through a consultative process. They agree upon a community enforcement structure and ratify the law in a courtroom, giving the Dina legal weight. In areas where the Fisheries Surveillance Centre has little reach, a Dina has the potential to deter illegal fishing practices. However, the Dina's reliance on community enforcement can be both an asset and a weakness.

Dina give all community members the opportunity to define management rules, though close community ties means fishers are sometimes reluctant to accuse neighbours of violating them. When defining a Dina, communities must balance the objective of penalising poaching from reserves with the need to maintain social cohesion and create realistic enforcement goals. Dina give all community members the opportunity to define management rules, though close community ties means fishers are sometimes reluctant to accuse neighbours of violating them.

When defining a Dina, communities must balance the objective of penalising poaching from reserves with the need to maintain social cohesion and create realistic enforcement goals.

As well as the Dina, which though effective at the local level, does not ensure exclusive user rights for local communities, LMMAs in Madagascar have also made use of two other governance frameworks: The GELOSE law has been applied to mangrove areas to transfer management rights to local communities, though has thus far not been successfully applied to marine areas or fisheries; and the Madagascar protected area framework via category V or VI co-managed protected areas.

The successful proliferation of LMMAs, primarily governed through community Dina, has generated considerable political will for stronger legal recognition of community management of marine and coastal resources.

Indeed, in a landmark speech at the 2014 World Parks Congress, the President of the Republic of Madagascar, Hery Rajaonarimampianina, committed Madagascar in the promotion of community management of marine resources, as well as the tripling of marine protected areas. This speech also announced plans to develop an improved legal framework for LMMAs to formalise community rights to manage their fisheries.



3.2 Building a network

LMMA in Madagascar have proliferated from one octopus closure in Andavadoaka to a large number of communities engaged in initiatives spread around the coasts of the country. This has led to greater need for information sharing, to communicate and streamline LMMA components and best practice. As a result, the first annual LMMA forum was organised by the different supporting NGOs in 2012, with the aim of facilitating peer-to-peer learning amongst coastal communities. From this initial forum, the MIHARI network was born.

The network facilitates fisher-fisher exchanges, allowing communities to showcase successes and discuss challenges amongst each other. Such exchanges have proven highly effective in transferring conservation knowledge [14]. Furthermore, MIHARI represents an opportunity to standardise LMMA monitoring methods, furthering collective knowledge of what works in small-scale fisheries management.

The MIHARI network has raised the profile of LMMA in Madagascar and serves as a collaborative network and advocacy platform for traditional fishing communities.

Madagascar's LMMA cover over 11% of the coast's inshore seabed, a remarkable achievement for only a decade of adoption, and one that has been driven almost entirely by local communities and non-state actors. This momentum indicates that LMMA are becoming an indispensable supplement to centralised fisheries management, rapidly changing the current open-access regime to bring traditional fishers into the fold of improving fisheries sustainability.

Given Madagascar's challenges with food security and coastal poverty, LMMA bring a much-needed pragmatic approach to mitigating overfishing for resource-dependent fishing communities.





4. How to set up an LMMA

In this Resource Kit, a framework for setting up an LMMA is presented (Figure 1). The process for setting up an LMMA is simplified into four key stages which guide each section of this Resource Kit:

Initial Assessment;

Planning and Design;

Implementation; and

Ongoing Management.

Each stage in setting up an LMMA involves a number of important processes, which are described in detail at each stage in the Resource Kit. Each stage is designed so that it can be accessed and understood individually, however it is important to always keep in mind the whole process when considering each component. The guidance presented here is intended to be comprehensive, yet not prescriptive. Each site and situation will have its own set of circumstances, and flexibility in approach is important. However, it is important to always keep in mind when designing and implementing LMMAs that they should be:

- 'For the community, by the community' and as such communication, participation and transparency is key.
- Founded on clear goals and objectives.

The framework presented in this Resource Kit is similar to that within the Pacific LMMA guide [9]. In this way, the Resource Kit is intended to complement the comprehensive guidance presented in the Pacific LMMA guide, while providing additional information and examples from LMMA experience in the Western Indian Ocean (WIO) area.

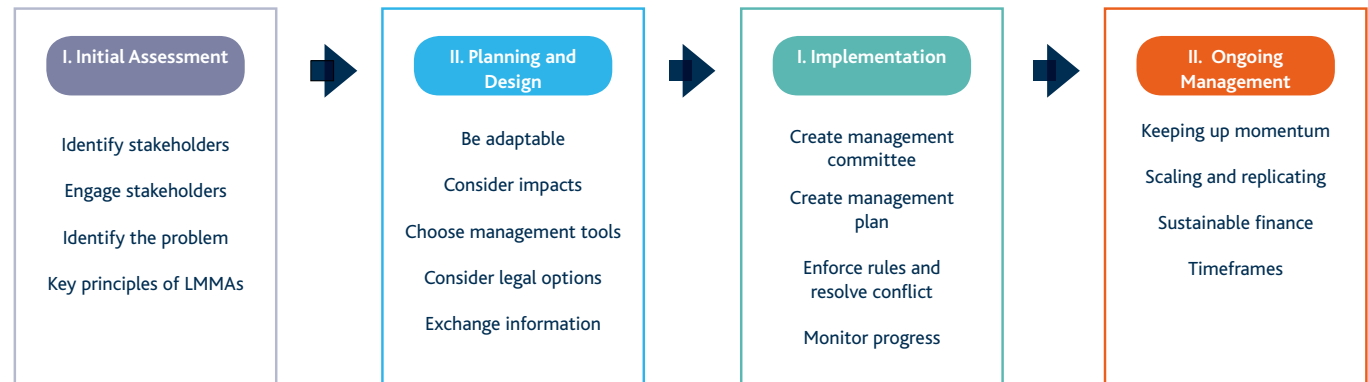


Figure 4.1 Flow chart depicting the four main stages of LMMA creation, and the key processes involved at each stage.



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Stage 1: Initial Assessment

Introduction to Stage 1

6. Identify Stakeholders

7. Engage Stakeholders

8. Identify the Problem

9. Key LMMA Principles

10. References



Introduction to Stage 1

This first stage of LMMA creation involves gathering as much information as possible about the resource problem, its causes and considering potential solutions.

The aim is to build a comprehensive picture of the resource issue and the stakeholders who will be affected by the LMMA approach. This helps to tailor management responses accordingly, and so is a vital precursor to LMMA planning and design.

As with all stages of LMMA creation this is not necessarily a linear process, approaches must be adapted according to context and may need to be repeated throughout the LMMA lifecycle.

By the end of this stage you will have begun the process of:

- Identifying stakeholders and their roles and responsibilities
- Engaging stakeholders to ensure their support and involvement in LMMA planning and implementation
- Identifying the resource problem and considering solutions





6. Identify Stakeholders

6.1 What are stakeholders?

Stakeholders of an LMMA are all the people who have an interest in the resource and/or the area that is being managed. These can be people who will support, oppose or be impacted by the LMMA.

LMMA stakeholders include, but are not limited to:

- Community members: Both individuals and households, including the resource users, women, youth and minority/marginalised groups
- Community leaders and community groups, including religious and environmental groups and the LMMA management committee (that will be formed upon LMMA creation)
- Government agencies: National and regional ministries and local authorities
- NGOs
- University/Research Institute experts
- Commercial purchasers/sellers of seafood
- Other resource/LMMA area users: e.g. migrant fishers, tourism operators

For the sake of clarity, in this Resource Kit we classify stakeholders into the following broad groups that represent similarity in interests:

1. Communities

Individuals and groups: including resource users (e.g. fishers), women, youth, marginalised groups, households, community leaders and community groups, and the LMMA Management Committee.

1. Administrators

The relevant Government agencies: including national, regional and local departments

2. Technical Partners

Those with expert knowledge on the area, the resource and/or its management: including NGOs and universities/research institutes.

3. Commercial Seafood Collectors

Those with a commercial interest in the resource, from local collectors that purchase/sell on local and regional markets to larger export-oriented companies.

4. 'Other'

All other individuals or groups with a vested interest: including migrant fishers outside the target communities and private enterprise such as tourism operators.

6.2 How to identify stakeholders

The communities that have requested/voiced interest in the LMMA are stakeholders, and are thus easily identified. Identifying other stakeholder groups such as the relevant government authorities, and technical experts working in the area is also likely to be fairly straightforward. However, other groups or people affected by the project may not be immediately obvious, and it is important to take the time to try and identify these stakeholders at this stage.

Arrangements regarding the use and management of natural resources are often very complex, involving multiple actors with varied stakes in and influence over the resource. Identifying as many stakeholders as possible prior to LMMA planning and design helps to build a comprehensive picture of the resource management problems, and its causes. This knowledge can then be used to tailor management plans appropriately, helping to maximise the chances of LMMA success and minimise the chances of unexpected obstacles.

Working through the following steps will help to identify LMMA stakeholders. When working through this process it is helpful to keep in mind the following questions [1]

- Who will benefit from the LMMA?
- Who will be impacted (positively and negatively) by the LMMA?
- Who can/will influence the LMMA?



- Are there any other groups that may be involved? Think about the way the resource is being used, the 'chain of custody' involved. This means considering the location of the resource at each stage of its development, from harvesting to processing, manufacture, sale and use, and the people or groups that are involved/have an interest in each stage of this 'chain'.

1 Conduct a literature review

Consult available literature on your area and its biodiversity to find resource users, resource managers, scientists, and community leaders. This literature may be in the form of reports, media articles and scientific papers; found online, in libraries, government offices and research institutes/NGOs. Researching this information, while considering the above questions, will result in a preliminary stakeholder list for the LMMA.

2 Talk to experts

Conduct informal interviews with the key stakeholders identified so far. Informal discussion with identified experts will further identify groups or individuals that should be included in planning and implementation of the LMMA, but might not yet have been considered. Key stakeholders at this stage might be the local authorities, technical experts (NGOs/researchers) working in the area and community leaders/members identified as having familiarity with the issues.

3 Think beyond conservation

Your project will likely influence community life in ways beyond conservation, e.g. by affecting local food and water supplies or public health. Reach out to key influencers in these areas too, such as community groups or NGOs working on these topics.

4 Identify gaps

Check your list of stakeholders identified so far with community experts and leaders. Are there critical areas that aren't covered? Consider individuals within stakeholder groups that might not always have their voices heard, such as women and any marginalised groups in a community.

5 Conduct a stakeholder analysis

LMMA stakeholders will often have different, and even opposing, interests and opinions regarding the resource. These interests and opinions can be influenced by their socio-economic position, political power and how directly they might depend on the resource (See Box 11).

Now that you have a list of prospective stakeholders, think about how they will impact your project. Questions to consider are [1]:

- In what ways are they affected by the problem that needs to be resolved?
- To what extent are they affected by the problem? (Choose between: very low/low/moderate/high/very high)

- In what ways do they contribute to the problem?
- To what extent do they contribute to the problem? (Choose between: very low/low/moderate/high/very high)
- In what ways will they likely be affected by project outcomes?
- To what extent might they be affected by project outcomes? (Choose between: very low/low/moderate/high/very high)
- In what ways can they influence the decisions regarding the LMMA management?
- To what extent can they influence the decisions regarding the LMMA management? (Choose between: very low/low/moderate/high/very high)

It is useful to list the answers to these questions alongside the stakeholder name, contact details and their stakeholder group within a matrix. This stakeholder matrix can then be used to help rank stakeholders according to relationship to the LMMA and how they might be involved in it [1]:

- **Primary stakeholders** have a *direct*, significant and specific interest in the resource and/or the area being managed. These people will be most directly affected by the resource problem and efforts to manage it. It is important to *directly involve* these people, or representatives of these people, in management activities. Examples of primary stakeholders include fishers, reef harvesters etc.



- **Secondary stakeholders** do not use the resource or depend on it directly, but they do *indirectly* use or benefit from the resource and their actions may impact the resource and/or area. Some of these stakeholders will be very influential and important to managing the resource problem and will need to be *consulted* in and of activities. Examples of secondary stakeholders include commercial seafood collectors and tourist operators.
- **Third level stakeholders or key organisations** are those with *direct responsibility* for the resource and area as well as for the primary and secondary stakeholders. These stakeholders might *either be directly involved* in activities *or assist in an advisory manner*. Examples include government agencies, NGOs and other technical agencies such as research institutes and community groups (e.g. religious groups, women's groups, environmental groups).

Ranking stakeholders in this way helps to determine their roles and responsibilities in the LMMA, and whether their involvement in management is direct or indirect through consultation. Mahanty and Stacey (2004) provide really useful detailed guidance on stakeholder analysis, and a number of activities to work through to help with the process (see 'Useful resources' below).

In general, the LMMA roles and responsibilities of stakeholder groups will be divided as follows:





Table 6.1 LMMA roles and responsibilities for different stakeholder groups

Stakeholders		Roles & Responsibilities
Communities	All individuals and groups	<ul style="list-style-type: none"> ■ Identify and agree on the need for the LMMA ■ Elect/establish the LMMA Management Committee ■ Participate in LMMA community activities (e.g. meetings) ■ Implement and respect LMMA management measures
	LMMA Management Committee	<ul style="list-style-type: none"> ■ Represent LMMA communities to NGO partners, funders and other stakeholders: presenting issues and concerns of the communities ■ Communicate LMMA activities and plans to other community members ■ Collaborate with NGO partners for LMMA planning and implementation, such as devising management plans and financial management ■ Assist local communities in Dina enforcement ■ Manage and resolve conflict ■ General awareness raising of LMMA activities within communities, e.g. importance of sustainable resource management ■ Develop local-level sustainable finance strategy with NGO partners ■ Assist with LMMA monitoring and evaluation ■ Collect data on resource use within the LMMA, such as catch effort. ■ Submit a periodic report to regional authorities
Administrators	National and Regional agencies	<ul style="list-style-type: none"> ■ Support communities in LMMA planning and implementation ■ Revise and approve community laws (Dina), and LMMA management plans/contracts ■ Issue and renew necessary licenses, such as authorisations of industrial and/or artisanal fisheries ■ Monitor and review LMMA management measures ■ Ensure local initiatives are integrated in the regional development plan ■ Assist communities with LMMA promotion and awareness raising ■ Assist search for funding to support LMMA ■ Fix fees on industrial fishing activities ■ Advise Technical partners and communities on existing legal frameworks/adaptation of legal frameworks for LMMAs



Stakeholders		Roles & Responsibilities
Administrators	Local agencies	<ul style="list-style-type: none"> Support communities in LMMA planning and implementation Approve/review local regulations Assist with enforcement and conflict resolution Provide technical assistance Inform National/Regional agencies on LMMA activities
Technical Partners		<ul style="list-style-type: none"> Collaborate with community stakeholders for LMMA planning and implementation, including setting objectives, devising management plans and financial management Communication of LMMA objectives and progress to wider audiences, including nationally and internationally Seek funding, especially at the beginning of the project Run LMMA Monitoring and evaluation, together with local communities Develop local-level sustainable finance strategy Build local-level capacity in all aspects of LMMA management Promote alternative livelihood projects Facilitate communication between LMMA Management Committee and Administrators
Commercial Seafood Collectors		<ul style="list-style-type: none"> General facilitation, especially if the LMMA targets a commercially important species. Motivate local communities in fisheries management by introducing economic benefits (e.g. supporting temporary closures by offering higher prices for seafood on opening days). Can help with monitoring and reporting of poaching.
'Other' (e.g. tourism operators)		<ul style="list-style-type: none"> Motivate local communities in fisheries management by introducing economic benefits Participate in fisheries management strategic planning

Remember!

You might not always identify all of your stakeholders during the initial assessment phase. As LMMA planning and implementation progresses, other people or groups with an interest in the project may become apparent. Be open to this, stakeholder analysis should be repeated fairly frequently in the LMMA lifecycle because stakeholder roles and influence will evolve as the project evolves and this needs to be accounted for.



BOX 6.1 Variation within communities

The influence of different stakeholders over the LMMA will vary not just between stakeholder groups, but also within them. This is especially true within the community group: a community is not a homogenous entity, but rather it is made up of people with different rights, opportunities, beliefs and power. This variation could be due to wealth, gender, religious or ethnic affiliation, lineage and/or many other potentially subtle variations. This means that the LMMA might not be equally suited to all households and individuals, but rather might benefit some people more than others.

For this reason, it is important to try and understand this variation within communities and take it into account when planning and implementing the LMMA. This is why conducting a stakeholder analysis at this stage of LMMA creation is vital, as it will help to identify different groups and determine their role within the LMMA process to ensure all voices and opinions are taken into account.

Stakeholder analysis within a community is best conducted in a participatory manner, i.e. with the community. It helps differentiate sub-groups by classifying individuals or households according to criteria that can be easily defined through discussion with key informants from the community (select informants that represent the

whole community, not just people in a position of power): criteria such as livelihood type (e.g. fisher, farmer, small business owner) and wealth.

Wealth ranking is a useful exercise to differentiate between wealth groups within a community. This requires asking key informants to identify relevant wealth criteria (e.g. land owned, assets owned), and then together use these criteria to define categories of wealth such as high-income, middle-income and low-income within which to list households. This is usually done by gathering a list of all household heads within a village and, with the help of the key informants, reading through the list and assigning each household to one of the wealth groups.





6.3 Useful Resources

- Mahanty S, Stacey N (2004) Collaborating for Sustainability: A Resource Kit for facilitators of participatory natural resource management in the Pacific: 246.
 - Module 2: Topic 2.1 gives detailed descriptions for approaches to stakeholder identification.
 - Module 3 Provides easy to follow practical exercises for stakeholder analysis.
 - Freely available online: <http://www.icran.org/pdf/SustainabilityResourceKitFinal.pdf>
- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapter 4 provides detailed descriptions of different stakeholder groups and their influence and interests regarding natural resource management.
 - Freely available online <http://bit.ly/1UIDK0a>
- Blomley, T. & Richards, M. (2011) Community Engagement Guidance: Good Practice for Forest Carbon Projects. In: Building Forest Carbon Projects. Eds. Johannes Ebeling, J. & Olander, J. Washington DC: Forest Trends.
 - Guidance on stakeholder analysis and wealth ranking is provided in chapter 5.2
 - Freely available online http://www.forest-trends.org/publication_details.php?publicationID=2865





7. Engage Stakeholders

7.1 What is stakeholder engagement?

Stakeholder engagement broadly describes the process of actively including those affected by a project in its activities, in this case in all stages of LMMA planning and implementation. Engagement includes communicating management intentions to stakeholders, building relationships, gathering feedback and adapting approaches to help achieve agreed LMMA objectives and outcomes.

7.2 Why engage stakeholders?

Stakeholder engagement is a vital process for LMMA success. Stakeholder participation in LMMA planning and implementation allows for information sharing through open communication and dialogue; helping to identify benefits and threats, guide strategies and validate research. LMMAs that involve key stakeholders early on in the process are likely to be more productive, and face fewer challenges, having identified as best as possible the potential benefits and pit-falls of management interventions, and adapted accordingly.

Stakeholders	Why engage?
Communities	<ul style="list-style-type: none"> ■ LMMAs by their nature are community-driven. Engagement within and between communities is necessary to facilitate and enable the drive for resource management ■ To establish the resource problem and appropriate management tools ■ Identify and resolve areas of disagreement/conflict regarding the resource management ■ Ensure full community inclusion in management measures
Administrators	<ul style="list-style-type: none"> ■ Necessary to follow LMMA legal procedures ■ Important to maintain government support for LMMAs ■ Informing administrators, especially local government, encourages their trust and confidence in the LMMA and stakeholder intentions
Technical Partners	<ul style="list-style-type: none"> ■ Identify available expertise, equipment and training required by communities to manage their LMMA ■ Collaboration between technical partners helps to achieve common goals
Commercial Seafood Collectors	<ul style="list-style-type: none"> ■ To aid facilitation of management especially if affecting commercial species: for example will need to be informed if a temporary decrease in supply is expected followed by a large increase in supply, with regard to temporary closures and open days ■ To help process large amounts of seafood on opening days ■ To identify contributions, such as financial incentives
'Other' (e.g. tourism operators)	<ul style="list-style-type: none"> ■ To assess willingness to assist/comply with ■ LMMA management tools ■ To identify contributions, such as potential incentives, financial assistance and communication/outreach assistance

Table 7.1 Different stakeholder groups and reasons for engagement



7.3 How to engage stakeholders

Stakeholder engagement is not limited to this first stage of LMMA development, but rather is a continual process in the lifespan of an LMMA. Throughout this Resource Kit a number of practical exercises are presented relevant to each stage of LMMA development. These exercises differ according to their objective and the target group, yet all can be considered 'engagement'.

Stakeholder engagement can be both formal and informal. It often takes the form of meetings and workshops to create formal discussion forums, but relationships are also built through more casual encounters. The aim of engagement is always to facilitate communication of intentions, to allow for feedback and adaptation in the LMMA approach.

Steps for approaching and engaging community stakeholders are described in more detail below. Before engaging with communities in detail, it is important to ensure other stakeholder groups are aware of your intentions to assist the communities with the creation of an LMMA. This can be a simple introduction of your NGO and objectives with invitation for forthcoming planning meetings/more detailed updates on plans and progress once communities are fully engaged and planning is underway. This is especially important with Administrator and Commercial Stakeholder groups, as it is polite to make introductions early on, to disclose intentions and helps to gain approval of planned work in the area. This does create some risk that plans might be derailed before they have begun if these groups are not in agreement, however usually any disagreements can be overcome with discussion and negotiation. Despite

the risk, it is better practice to be polite and make early introductions, especially with Administrators in the area.

The level of engagement within and between each stakeholder group will vary, given the division in roles and responsibilities for an LMMA. There is no one right way to engage stakeholders, however there are a number of principles of good practice to keep in mind when approaching and working with those affected by the LMMA:

Respect cultural differences. Observe social norms such as acceptable greetings and dress code, and respect religious practices. Be polite, humble and listen to stakeholder opinions without imposing your own. Staying within a community, building a rapport and sharing meals can help to build trust. Be gender sensitive in your approach (see Box 12).

Spend time with stakeholders. There is no short cut to gaining trust and support. Especially within communities it is good to be seen, spend time in the villages and meet people. Be prepared to discuss the broader issues within the community; do not try to push one particular agenda.

Be aware of educational levels, especially in communities where literacy rates are likely to be low. Using novel mediums such as pictures and films can help to convey complex ideas.

Use the local language if possible, unless a common language is accessible. Otherwise use an interpreter. Be mindful of errors in translation, crosschecking translation between more than one interpreter can help reducing misinterpretation.

Don't make promises that can't be kept. Be clear on objectives and expected outcomes without raising expectations. This is important to emphasise early on so that communities have clear understanding on the role of the technical partner is, i.e. to facilitate with the LMMA not to dig wells or repair schools. It is important to ensure everyone is aware of what the LMMA can and cannot do within the community. Ensuring realistic expectations helps to minimise disappointment and complaints/conflict as the project progresses.

Create a checklist of people that need to be kept informed of particular activities. For example, inviting the right individuals to meetings, such as community leaders and local administrators, can sometimes be more important than the meeting itself. Not informing the right person at a particular stage might cause offence and derail any decisions made.

Communicate plans and activities widely. Ensure any meetings or activities are planned in advance and at mutually agreeable times and locations to maximise attendance. Ensure any changes in plans/activities are communicated as early as possible. Being on time and sticking to agreements helps to build trust and confidence between stakeholders.

Always acknowledge stakeholders in project outputs such as reports, media releases, within stakeholder meetings and external presentations. Be aware of information 'ownership' and respect confidentiality and privacy.



7.4 The Importance of facilitation

A facilitator is someone who helps a process to function and achieve its stated aims. Many of the processes in this Resource Kit are presented as activities, carried out in the form of meetings or workshops. For these activities to function well, it is important to have good facilitation.

For the purpose of this Resource Kit a facilitator is someone who helps to create an 'enabling environment' in these meetings and workshops [1]. Facilitators are responsible for setting up and running activities, however they should be impartial, helping participants to work through issues and reach consensus on opinion. The facilitator might present new information but not their own opinions and solutions. This requires a lot of sensitivity for the issues and the participants. Facilitators are most often staff members from the technical partner, or someone from outside the project with good knowledge of the issues such as a member of a larger LMMA network group.

Tips for good facilitation:

- Explain your role at the outset of the activity, i.e. as a facilitator you might present new information and will guide the activity, but your main aim is to encourage the group to openly communicate and learn together.
- Be friendly and open, smile and show respect
- Listen more than talk
- Be sensitive to local custom, don't judge

- Protect group members should conflict in opinion arise
- Encourage everyone to participate, being sensitive to gender and culture. Some people may participate in different ways.
- Energise the group or slow it down as needed, remaining aware of time constraints
- Keep the discussion moving, recapping where needed, to help meet the stated objective of the activity
- Use novel communication methods where possible to maintain enthusiasm and momentum e.g. photos, films, presentations
- Be adaptable and flexible
- Be interested in all aspects of people's lives
- Be fun!

BOX 7.1 Consider Gender

It is important to be aware that in Madagascar, as in many developing countries, men and women often have different roles and interests in natural resource management. Roles can vary between region, but often men are more involved with collecting natural resources for commercial purposes while women manage natural resources daily to meet household subsistence needs. Despite this hands-on knowledge, women are often under-represented in natural resource management because of the division of labour and role in community decision-making.

In Madagascar, as in many developing countries, women catch a large proportion of marine catch for the home and market by gleaning for shellfish, catching octopus or line fishing [2]. Such women are primary stakeholders, and will

be directly impacted by an LMMA. In addition, their unique knowledge as resource-users should be captured in LMMA planning and design to help improve long-term success. For these reasons, women should be encouraged to participate in the LMMA. When conducting engagement activities try to encourage as many women as men to take part.

Women's participation might be difficult to achieve at first, it is best to ask what time of day and which location would help to maximise attendance in activities. This helps to avoid busy times within a household, such as meal preparation. In some cases it might be best to hold separate male and female meetings, to allow women to voice opinions and take part to avoid potential male domination. Working together, the best role for women in the implementation of the LMMA can be discovered, and gender equity can be encouraged.



7.5 Useful Resources:

- Worldfish (2013) Community-based marine resource management in Solomon Islands: A facilitator's guide. Based on lessons implementing CBRM with rural coastal communities in Solomon Islands (2005-2013). CGIAR Research Program on Aquatic Agricultural Systems. Penang, Malaysia. Manual: AAS-2013-17.
 - Module 2 & Toolbox p44 provides a lot of detail on the facilitator's role in community based natural resource management, and discusses effective communication methods.
- Mahanty S, Stacey N (2004) Collaborating for Sustainability: A resource kit for facilitators of participatory natural resource management in the Pacific: 246.
 - Module 2: Topic 2.4 describes the importance of facilitation at length.
 - Module 2: Topic 2.5 presents good skills and attitudes of facilitators, provides activities for facilitators to conduct to test their skills and describes at length the facilitation process.
- Govan, H., Aalbersberg, W., Tawake, A., and Parks, J. (2008). Locally-Managed Marine Areas: A guide for practitioners. The Locally-Managed Marine Area Network.
 - 'The Importance of facilitation' (p9) discusses the importance of facilitation with specific reference for LMMA practitioners.
- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapter 6: Box 6.14 provides guidelines for facilitating focus group discussions.
- Pretty, J., Guijt I., Thompson J., Scoones I. (1995) Participatory Learning and Action: A Trainer's Guide. IIED, London.
 - A helpful resource for community engagement and consultation, useful for all stages of LMMA creation. Includes detailed guidance on good facilitation and exercises on encouraging participation.





7.6 Community engagement

Given the community-led nature of LMMAs, successfully engaging this group is vital for project success. While LMMAs in Madagascar have often had a variety of starting points, ideally, the community itself will have identified the need for resource management and will be seeking assistance in how to do this best. However, it may not always be the case that everyone in the community will be in agreement, and the manner of introducing the LMMA approach can have a big impact on willingness to take part.

The next chapter describes activities and best practice to help identify the resource problem and evaluate a community's motivation for managing the resource. Before conducting this evaluation it is important to establish a rapport between the community and project partners. It is important to 'take the pulse of the community' in the initial approach. In the majority of cases a community will recognise the resource problem and want to address it, but the initial approach is key to gaining trust and communicating the LMMA message in the right way. Some key steps to consider for this initial approach are described below:

1 Initial community visits

- When visiting a community at the beginning of an LMMA initiative as a technical partner or facilitator, it is important to present yourself to the village president (the chef fokontany). Introduce yourself and your organisation to the president and have a general discussion of the community's request for help. Explain the need to

hold a village meeting with as many people attending as possible, discuss the best time and location of this meeting and agree on a date and place. Request help with communicating this meeting and its purpose as widely as possible.

- Walk around the village and meet people, have informal discussions with villagers regarding village resources and the problems they face. Bring the discussion gently to the resource in question, what do they think is the cause of the problem and do they think there are any solutions? Try not to focus too much on negative aspects but also discuss the positives of the village, the benefits of living there for example. Explain your position and inform them of an upcoming village meeting to discuss the issues.
- After this, leave the village, write up all your data and reflect on what some of the problems facing the village are.

2 Prepare for the first village meeting

- It is vital to ensure as many people and interests are represented in village meetings. To help communicate the first meeting as widely as possible, it can be useful to traverse the village in a coordinated manner such as from North to South in company with community members (leaders). The community leaders should introduce you and your objectives to all households and invite them to the meeting, discussing its purpose and presenting it as an opportunity to contribute their opinions.
- This is a time consuming step, but it is vital to capture all opinions and will also help build a comprehensive profile of the community, its members and the problems it faces.

In addition, visiting households before a meeting will help improve attendance by encouraging those that might not normally participate.

3 Conduct the first village meeting

- This first meeting is an opportunity for the community to discuss in general the resource problem and related issues.
- Allow the attendees to lead the meeting, facilitate this by trying to ensure all voices are heard. Do not offer solutions at this stage, more use this as an opportunity to gather as many perceptions as possible regarding the resource problem.
- After the meeting, either the next day or as soon as possible after that, walk from door to door again asking people their opinion on the meeting and whether there was anything they would have liked to raise but did not.
- After this, leave the village again and reflect on your data. Think about every aspect of the community, including village politics and dynamics. What issues did most people agree on? What issues did people disagree on? Were there any individuals or groups that were not being represented or heard?
- Plan for the next activity, which will most likely be the community consultations to begin the process of identifying and discussing the resource problem in detail.



7.7 Useful Resources:

- Blomley, T. & Richards, M. (2011) Community Engagement Guidance: Good Practice for Forest Carbon Projects. In: Building Forest Carbon Projects. Eds. Johannes Ebeling, J. & Olander, J. Washington DC: Forest Trends.
 - Although focussed on forest carbon projects, this resource provides useful guidance on stakeholder engagement in general, including important factors such as equity and local governance.
- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapter 6 provides guidance on community introductions.
- The Economics and Ecosystems and Biodiversity (TEEB) Training Resource Material. Module 2: Engaging Stakeholders.
 - A series of Power Point presentations providing an overview of stakeholder engagement.
 - Freely available online: <http://www.teebweb.org/resources/training-resource-material/module-2/>
- Pretty, J., Guijt I., Thompson J., Scoones I. (1995) Participatory Learning and Action: A Trainer's Guide. IIED, London.
 - A helpful resource for community engagement and consultation, useful for all stages of LMMA creation. Includes exercises to help encourage participation
 - Freely available online: <http://pubs.iied.org/6021IIED.html>





8. Identify the Problem

8.1 Assessing the situation

LMMA's are 'For communities, by communities'. In the majority of situations, the community itself will have identified the resource problem – such as a reduction in fish catch over time – and will be seeking outside assistance from technical experts to find a solution. However, in some cases (although not ideal) a resource problem might have been identified externally and community support for LMMA implementation needs to be sought. Either way, adopting the LMMA approach as a solution is a long-term process, and one that requires significant investment by the community to work.

The long-term aim for an LMMA is for community management to be sustainable without, or at least with minimal, external assistance. Given this, it is important to assess the resource problem and the community's willingness and ability to tackle it before a decision to assist is taken.

To ensure adequate community ownership, it is critical not to pressure the community into agreeing to management measures that they are not necessarily motivated to enforce. Once adequate recognition of a need for management and community motivation exists, you can move on to the next stage of LMMA set up.

This first step is critical, and if carried out properly results in a community that is motivated to manage their marine resources and feels a strong sense of ownership over the initiative. Refrain from proposing management measures (such as a marine reserve) before the need for management and community motivation has been established. Otherwise the proposed action may always be perceived as an "outsider" initiative, and suffer from poor community ownership.

Questions to consider at this stage are [2]:

- Whose idea was it? Did the request come from an appropriate person or institution?
- Is the request genuine and the community committed?
- Are there any conflicts in the area (over power, ownership, etc.)?
- Are there insurmountable environmental problems?
- Will there be active opposition to the project from important stakeholders?
- Is there a past history with other projects; if so, what were the details?
- Is the potential partner organization in a position to offer sustained assistance?
- Will there be support from Government and Provincial agencies?
- What is the leadership situation in the community?

Working through such questions at the beginning of community introductions helps to establish whether the community exhibit the 'enabling conditions' that are necessary for LMMA success:

- Recognition of the problem
- Desire for change
- Agreement in approach within and between stakeholders
- Absence of conflict/vested interests that might block the path
- Sufficient funding/options to sustain funds
- Trust and understanding

Remember!

If the community does not recognise a need for management, or are not motivated to take responsibility, be prepared to walk away from the initiative. However, be aware that it is unlikely all enabling conditions will be in place from the outset. Rather, they represent things to address throughout the stages of this Resource kit. Of primary importance at this stage is assessing the community's recognition of the problem, and their desire for change. This is assessed through preliminary diagnostics.



8.2 What are preliminary diagnostics?

Preliminary diagnostics are carried out with communities to assess their perception of the state of marine resources, the need for management and their motivation to take responsibility for management.

Diagnostic exercises are conducted through community consultations: using meetings, interviews and workshops. When conducting exercises it is useful to keep the following questions in mind [3]:

- Where are the important fishing areas, and are there any key differences between areas used?
- What is the key resource/resources? Which species?
- What are the key habitats for each resource?
- How is the resource used? How important is it for local livelihoods and/or for commercial interests?
- What fishing gear is used? Does this vary?
- What is the seasonality of the resource? Does the species aggregate in areas for spawning, or are there other fluctuations in abundance?
- How have resource stocks changed over time?
- What are the main threats to the resource?
- How is access to markets for selling the resource?
- Are there any alternatives to the resource, for both consumption and for sale?

- Diagnostic exercises include (see Box I3 for further details):
- Situation analysis:
 - Participatory resource mapping to gain spatial awareness of situation
 - Seasonal calendars to understand seasonal variations in resource abundance and livelihood activities
 - Historical timelines to understand how resources have changed over time
 - Focus groups to assess community knowledge and attitudes of the resource issue, identify existence of past and/or current formal or informal management initiatives, assess livelihood options and assess local governance and social organisation (leadership structure, local law enforcement, conflict resolution)
- Matrix ranking
- SWOT analysis

8.3 Useful tip!

Another term frequently used to describe engagement activities and diagnostic exercises in community-based natural resource management is **Participatory Rural Appraisal (PRA)**. PRA is a set of approaches that are used in combination to enable communities to share and learn about their knowledge and conditions, to help with monitoring and managing of resources. Exercises are always conducted in a participatory manner, with the role of the outsider being one of the facilitator – encouraging information flow and assisting with exercises. The FAO provides detailed information on PRA and diagnostic exercises in their 'PRA Toolbox' available online:

<http://bit.ly/1mWoj11>





Box 8.1 Diagnostic exercises

A brief overview of some common diagnostic exercises is presented here. For detailed guidance on carrying out these exercises in practice, see the 'Useful Resources' section at the end of this chapter.

Focus groups

are formal discussions held with a group of people that might have similar interests or characteristics, or might represent the wider community. Participants should be chosen at random to ensure no bias to people of influence or power. Often it is useful to hold separate focus groups for men and women, to allow for open dialogue in cultures with division of labour between genders. Focus groups are usually structured around a set of pre-determined, open-ended questions that are designed to focussed enough so that discussion centres around a particular topic yet flexible enough to allow for new information and opinions to emerge.

Participatory resource mapping

is a useful exercise to build relationships with community members while also yielding useful spatial information of the local infrastructure, boundaries, geographic features such as different marine habitats, and spatial information regarding resource use. Mapping is usually conducted within focus groups of participants that are selected to represent the community, including both men and women. It involves asking participants to draw on a map of the area, or two draw a map of the area from scratch. Drawing is directed using a questionnaire that asks about geographic features, and this can then develop into a wider discussion of resource issues, which can be marked on the map next to the affected area (e.g. overfishing in a particular area) or noted separately.

Seasonal calendars

are devised with the community to discuss and identify variations in the resource and how it is used over the year, as well as any particular activities that dominate the community calendar at certain times of year (such as large harvests). This information is useful as seasonal variations can impact management activities. Calendars are usually conducted with focus groups but should be confirmed by the wider community through village meetings.

Matrix ranking

allows stakeholders to rate the resource issues by order of importance, including the type of issue and its causes (threats to the resource). This helps the community to prioritise the most important issues and threats facing them, and helps to identify the focus of the LMMA management actions. Further discussion of threats and understanding the cause of the resource problem is presented in *Stage 2: Chapter 2 'Consider Impacts'*.

SWOT analysis

helps communities to identify their Strengths, Weaknesses, Opportunities and Threats, which are useful to help identify areas the community can enhance and improve on to help manage their own resources. Usually, participants are divided into groups and each are asked to brainstorm the community's strengths (characteristics that can help management work), weaknesses (characteristics that might impede management), opportunities (external options that could be utilised and built upon to improve management) and threats (external factors that might hinder management). Groups then present their workings in turn to the wider group to consolidate findings.

8.4 Basic principles of good community consultation

A community consultation is a generic term to describe the format within which planning and implementation activities are conducted with the community. These usually take the form of meetings, interviews, focus groups and workshops.

Given the variety between and within communities there is no right way to carry out a community consultation, rather the process will always be context-specific. Generally the best approach is a logical one: be sensitive to opinions and attitudes, continually assess whether a communication style is working, and be ready to adapt and learn from exchanges with community members. However, there are some basic principles of good practice that can be followed to aid the process [4][5]:

Be targeted at those most likely to be affected by the consultation. This will often be the community as a whole when consulting on LMMA planning and design, or it may be only women, youth, gleaners, pelagic fishermen, mangrove users for example if the consultation is targeting a specific resource user group.

Be timely to scope the key issues and have an effect on the project decisions. It is very important that enough time is given to the targeted community to allow them express their view and influence the outcomes. Decisions should not be made without consulting the community.

Early consultation will minimise the chances of other resource users becoming apparent after identified stakeholders have made a decision. It also allows the



community enough time to make changes to decisions if situations within the community should suddenly change.

Be informed by communicating information about the consultation to communities in advance. Approach communities before conducting a consultation and introduce yourself and your objectives, inviting individuals to the meeting. It can be useful to traverse the village in a coordinated manner such as from North to South, to ensure all households have been contacted. This can be time consuming, but will improve attendance for a meeting by encouraging those that might not normally participate helping to capture all opinions and build a comprehensive profile of the community.

Be meaningful to those consulted because the content is presented in a clear and understandable format, and the techniques used are appropriate for the context. Films, photos and presentations are useful communication tools that, when used interchangeably, help to maintain interest and enthusiasm in meetings and decision-making.

Be effective. Although decision-making strives for consensus, complete agreement need not be the outcome. Be clear on how the decisions will be made so that participants know and understand the impact of their involvement. Make sure all participants have time to become well informed on the issues and understand material. This is important because it is unlikely the community will have prior familiarity with the subject.

Be well facilitated. It is important that a facilitator controls the agenda and content because this will give the process more credibility. An independent, skilled and flexible facilitator with no vested interest is essential in order to achieve this.

Be open, fair and subject to evaluation. Evaluation questions should be formulated in advance, it helps to decide how the 'success' of the consultation will be measured. Include factors beyond the adoption of recommendations. Feedback on outcomes to the community after consultation is over is essential, as well as getting feedback from the community on how meetings can be improved.

Be cost-effective. Consultations can take time and be expensive. Some questions will require broader consultation, others more targeted consultation. Costs will vary depending on food, transport and accommodation requirements. Ensure the approach selected is properly resourced.

Be inclusive of opinions, gender and different groups. Selecting participants at random offers the best chance of achieving a cross-section of the community that represents a wide variety of interests and opinions. For example, assign each individual in the target group a number, and select numbers randomly until you have the required numbers to attend. To further minimise bias it is recommended your target group be stratified by potentially influencing factors, such as wealth, gender or age. This means further grouping people by these factors and selecting an equal number from each group randomly, such as picking names out of a hat.

Be mindful that men and women often have differing views and needs and different community groups (e.g. religious groups, small business groups) may have differing opinions, and these should be represented as best as possible.

Be participatory so that everyone has the opportunity to exchange views and information, to listen, and to have their issues addressed.

Be community-focussed. Discourage discussion of what people want personally or what is in their self-interest, but what they consider is appropriate as a part of their wider community.

Be interactive. Encourage discussion of the big picture as a group, try to avoid 'yes or no' answer questions, to help with this discussion.

Be tailored to reflect appropriate timeframes, context and local languages. Seasonal calendars and participatory mapping can help with this.

Be documented to keep track of who has been consulted and the key issues raised. Write up and reflect on data and notes after every meeting.

Provide feedback in a timely way to participants and the wider communities if possible, with clarification of the next steps.

Be on going. Engagement never stops, and is required throughout the life of the project as part of an adaptable approach.



8.5 Conducting community consultations

The **aim** of community consultations is to reach agreement on a **unifying problem statement and mission**, i.e. what is desired from LMMA intervention, and reach agreement that the community and technical partner will work together to create the LMMA.

Again, there is no right way of conducting a consultation but in general the following steps provide an idea of the processes involved. It is important to adapt these to the community and the type of consultation in question, it will become clear which steps are necessary and which aren't after some time has been spent on conducting preliminary engagements with the community.

Step 1: Prepare for the first consultation

- Try to anticipate the potential outcomes of the consultation, including likely questions that will be asked and potential responses. It is important to be well prepared, minimising surprises in public meetings and thereby building trust through knowledge.
- Meet with the village president and/or community representatives in advance to inform them about the consultation:
 - Discuss the purpose of the consultation, what will be discussed, how it will be discussed, and the desired outcome.
 - Discuss the most appropriate date and location for people to attend, allowing enough time for villagers to be informed to maximise attendance.

- List the key stakeholders you have identified within the village so far to identify any missed, such as key social groups or individuals familiar with the subject. Ensure the right people will be present or at least represented for the consultation; this will likely vary depending on the type of consultation.
- Ask for advice on how best to consult the community, if there are any social organisations or processes to follow to facilitate the consultation.
- Discuss the best time of day to hold the consultation to fit with people's activities. Usually this is late afternoon, however it may change depending on fishing activities and sea tide. Ensure the activities of both women and men are accounted for when deciding on the best time. Check this carefully.
- Write up notes and data from this consultation to both analyse the outcome and continue building a comprehensive picture of the community and its needs.

Step 2: Gather participants

- It is likely the head of the village will be responsible for calling the community to consultations, following the village norm. Make sure to remind the president of the consultation a few hours beforehand to confirm it is going ahead.
- Arrive at the meeting place in advance of the designated time. If wide attendance is required, remind villagers you meet on the way, and ask them to remind friends, family and neighbours, even though often a 'call' is made to indicate a meeting is taking place such as a bell ringing or a whistle sounding.

Step 3: Consider time management

- The length of the consultation is very important to make sure the participants do not leave early and discussion remains active. Try not to make it too long, especially the first consultation, as participants may lose interest or need to leave to attend to activities, such as to cook or fish. Ideally, consultations should not be longer than 1.5-2 hours in length.
- Be aware of the best time during the consultation to engage participants in decision-making, to ensure effectiveness. Try not to leave all the decisions until the end, in case people have left.
- To help this, draw up a consultation plan, outlining the objectives and the contribution required from participants.

Step 4: Conducting the first consultation

- Make sure that background information is presented first to the participants, to set the context of the consultation and to remind people why they should be participating in the consultation.
- The consultation should be as participatory and interactive as possible, the use of novel materials such as maps and pictures of the area can stimulate discussion. Encourage full participation, for everyone's opinion to be heard.
- Be clear on objectives and the decisions that need to be made, solutions can be suggested but primarily encourage new ideas from the community.



- Ensure notes are taken throughout, documenting any concerns, agreements reached and anything that needs follow up.
- At the end of the consultation provide a summary of the outcomes reached. Be clear on responsibilities for the next steps.
- Always set a timeline for the next actions, even if the timing of the next action is not confirmed this helps to reassure the community that activities are on-going.
- Leave the village, reflect on the data and plan the next activity.

Step 5: Continue activities as necessary

- Repeat consultations/conduct new consultations as necessary until a comprehensive picture of the resource issues is identified.
- Be mindful not to conduct too many consultations though, try to be efficient otherwise this could be perceived as time wasting and communities may start to lose interest.

Step 6: Present the findings back to the community

- Discuss with the wider community the decisions and issues that were identified in during consultations and ensure wide consensus on findings.
- Now that issues have been identified, you can begin to discuss the potential solutions. Do not make promises and keep discussion of potential solutions broad at this stage, it is important not to raise hopes and expectations.

- Build trust. Identify your role as a facilitator within the community, discuss the assistance that can be provided but emphasise the role of the community in realising the solutions.
- Assess the motivation for management and discuss any potential disagreements. Some people may take time to convince on the benefits of management, for example migrant fishers. Do not be disheartened, it is a slow process that will take time and visible results before everybody in a community is satisfied and supporting the LMMA.

Other insights:

- The ultimate aim is to make the LMMA sustainable without outside support. Remember this; do not introduce too many technical measures that a community could not continue if support is withdrawn. Try not to create a culture of expectation through promises that might be hard to keep.
- A lot of time and effort will need to be spent in the community, to gain trust and clear insight into the village issues.
- Be aware of what measures have been implemented in the village before. Perhaps another NGO has tried to implement resource management here and it has not worked? A barrier to gaining trust may be the activities that have been carried out in the village before.
- Keep in mind the problems the village faces, food/water security might be the overwhelming issue, which will need to be addressed in any management plan.





8.6 Useful Resources:

- Govan, H., Aalbersberg, W., Tawake, A., and Parks, J. (2008). Locally-Managed Marine Areas: A guide for practitioners. The Locally-Managed Marine Area Network.
 - P18-32 lists a number of exercises to help with community engagement and problem diagnosis, including: mapping, problem identification, venn diagrams and matrix ranking.
- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapters 5, 6 and 7 provide guidance on conducting community meetings, assessing needs and problem identification.
- Mahanty S, Stacey N (2004) Collaborating for Sustainability: A resource kit for facilitators of participatory natural resource management in the Pacific: 246.
 - A number of stakeholder engagement activities and diagnostic exercises are presented, with easy to follow activity worksheets including: SWOT analysis and matrix ranking
- Worldfish (2013) Community-based marine resource management in Solomon Islands: A facilitator's guide. Based on lessons implementing CBRM with rural coastal communities in Solomon Islands (2005-2013). CGIAR Research Program on Aquatic Agricultural Systems. Penang, Malaysia.
 - Module 3 provides describes scoping activities and participatory diagnosis, while a number of exercises are described within the toolbox, including: focus groups, mapping, SWOT analysis and historical timelines.
- Pretty, J., Guijt I., Thompson J., Scoones I. (1995) Participatory Learning and Action: A Trainer's Guide. IIED, London.
 - A helpful resource for community engagement and consultation, useful for all stages of LMMA creation. Includes exercises to help encourage participation.
- IUCN (2004) Managing Marine Protected Areas: A Toolkit for the Western Indian Ocean. IUCN Eastern African Regional Programme, Nairobi, Kenya. p. xii + 172pp.
 - Section B provides some useful pointers on participatory processes.
- Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources of the Department of Agriculture, and Department of the Interior and Local Government (2001) Philippine Coastal Management Guidebook Series No. 3: Coastal Resource Management Planning. Coastal Resource Management Project of the Department of Environment and Nature Resources, Cebu City, Philippines, 94 p.
 - Chapter 3 provides guidance on issue identification, including diagnostic exercises and baseline assessment.
 - Available online: http://oneocean.org/download/db_files/crmguidebook3.pdf





9. Key LMMA Principles

The importance of participation is emphasised throughout this Resource Kit, because this is central to the nature of LMMAs: 'For communities, by communities'. For this reason it is vital that the tips and exercises identified in this first stage of the Resource Kit are kept in mind throughout all stages of LMMA creation, so that flexibility in approach is retained as it evolves. This helps the LMMA to be adaptable in design, and to constantly learn about changing conditions and adapt to improve success. Such adaptive management is introduced in the next stage of LMMA creation: 'Planning and Design'.

At this stage it is important to consider a few key LMMA principles that, if identified now, will help to establish stakeholder motivation for the LMMA at this stage of creation as well as to maintain this momentum throughout the life of the LMMA:

Build on the community motivation and incentive

to participate in management activities. Experience in Madagascar has identified the following community motivations for creating LMMAs:

- Communities care about managing their resources for their livelihoods and for future generations.
- Communities perceive economic benefit from the LMMA approach to resource management, such as the temporary closures and subsequent open days and aquaculture projects.
- Communities embrace the project because it is new, fun and word of LMMAs has spread from other sites in the country. Pride in taking part is a big motivating factor.

- There may be economic expectations for taking part, such as per diem payments. It is important to assess these expectations now, and address them.

Manage community expectations at the start of a project. Expectations regarding benefits can be high at the beginning of a project. It is important to manage these from the beginning, be sure people are aware of what to expect, such as for:

- Economic benefits, either directly through per diems or indirectly through improved fish catches. Payments for taking part (per diems) can create a lot of conflict between people, if unfairness is perceived. It can also create a culture of expectation, whereby people only take part for payment rather than for concern for the resource. In some cases payment might be necessary, where people spend a lot of time on management activities and thus lose payments from traditional livelihood activities. Whether to introduce such payments should be decided on at the beginning of the project, and clear rules and guidelines discussed from the outset with all community members.
- Stakeholder roles and responsibilities: be clear on who is responsible for what and when, and how much work is involved.
- Project sustainability: be mindful of potential changes in project funding and management
- Project timings: discuss how long it will take to set up, and when it is expected benefits might be felt.

Build local community ownership of the LMMA to ensure the community-led nature is felt strongly from the beginning and throughout. This can be difficult to achieve, especially if a high level of external input from technical partners is required. To help build this local ownership it is important to ensure communities are fully consulted at all stages of LMMA creation and that communities make the final decisions regarding management, for example:

- Ensure full participation of communities in the project cycle, from initial assessment to planning and design, implementation to ongoing management.
- Involve communities in the LMMA monitoring and evaluation process. This is very important for community-based adaptive management (CBAM, see [Stage 2: Chapter 1 'Be Adaptable'](#)), so that communities can identify themselves what is working and what needs to be adjusted.
- Resource management will remain exciting if local communities continue to perceive benefits from it over time. It is important to ensure communities can see these benefits are linked to their own efforts, not those of any external assistance, as this will help to maintain motivation.
- Celebrate every success; make it memorable by retelling success stories widely and frequently.



Communication is key! At all stages of LMMA creation it is important to communicate project aims, progress and plans to stakeholders and wider audiences. Use novel means where possible, encourage community LMMA events and press coverage of success stories.

While this first stage of the Resource Kit has focussed on community-based activities, it is important to ensure that other stakeholders are kept informed of activities and progress throughout. This is especially important for secondary stakeholders, whose support is important for LMMA success. Discussing activities and incorporating stakeholder views will help to both uphold the LMMA principles and its long-term sustainability.





10. References

1. Mahanty S, Stacey N (2004) Collaborating for Sustainability: A resource kit for facilitators of participatory natural resource management in the Pacific: 246.
2. Govan H, Aalbersberg W, Tawake A, Parks JE (2008) Locally-Managed Marine Areas : A guide to supporting Community-Based Adaptive Management: 1–70.
3. WorldFish (2013) Community-based marine resource management in Solomon Islands: A facilitators guide. Based on lessons implementing CBRM with rural coastal communities in Solomon Islands (2005-2013). CGIAR Res Progr Aquat Agric Syst Penang, Malaysia Manual: AA.
4. Carson L, Gelber K (2001) Ideas for community consultation: A discussion on principles and procedures for making consultation work. NSW, Australia.
5. International Finance Corporation (2007) Stakeholder Consultation Report.





Stage 2: LMMA Planning and Design

Introduction to Stage 2

13. Choose Management Tools

16. References

11. Be Adaptable

14. Consider Legal Options

12. Consider Impacts

15. Exchange Information



Introduction to Stage 2

This second stage of LMMA creation requires detailed consideration of the design of the LMMA and planning for the management approaches that will be adopted. Emphasis is placed on using a community-based adaptive management approach, considering the impacts of management actions to allow for monitoring and adapting accordingly.

Potential management tools are then presented, with detailed descriptions on the use of permanent or temporary No Take Zones (NTZs), as well as other tools such as alternative livelihood projects. Three Madagascar-specific mechanisms to establish legal protection are described in detail, and finally networks for exchange of information are suggested to encourage community sharing and learning of experiences.

By the end of this stage you will have begun the process of:

- Developing the LMMA Theory of Change, i.e. how you expect management will achieve expected aims
- Deciding on the management strategies that will be implemented
- Deciding on the legal framework to be adopted
- Learning from information exchanges with more established LMMAs





11. Be Adaptable

11.1 What is adaptive management?

The ecological and social systems that LMMAs operate in are complex, and the impact of management actions on these systems can be unpredictable and change over time. At this stage of LMMA creation, the resource problem and its causes have been identified and a set of assumptions will now be made regarding potential solutions to implement. While these assumptions are based upon local in-depth knowledge and scientific expertise, it is only by testing them that we can understand what management actions do and do not work, and why.

Adaptive management describes the process of systematically testing these resource management assumptions, in order to adapt and learn. This means management strategies are sufficiently flexible to changing conditions, and can be adjusted in light of new information. It is a process of learning by doing, but rather than one of trial and error, adaptive management is a methodical and on going cycle of implementing management, monitoring results, evaluating outcomes and revising actions accordingly (Figure 1). By using an adaptive management approach, uncertainty is reduced and management can better adapt to address the changing social and ecological conditions, and thereby maximise long-term effectiveness.

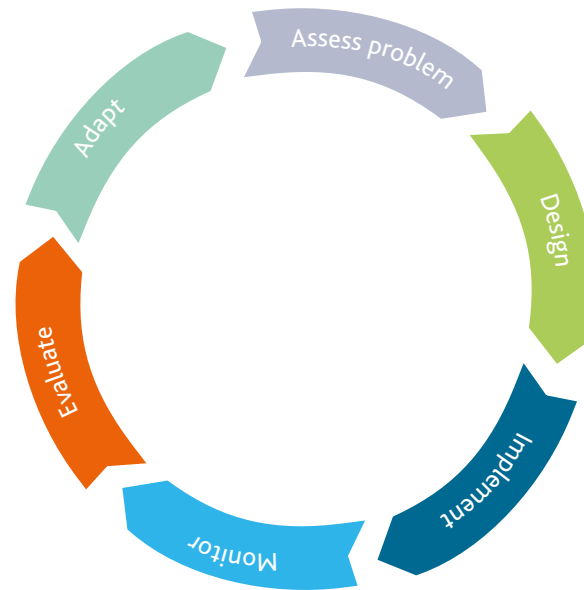


Figure 11.1 Adaptive management cycle

11.2 Useful Resources:

- Salafsky, N., R. Margoluis, and K. Redford. 2001. Adaptive Management: A Tool for Conservation Practitioners. Washington, D.C. Biodiversity Support Program. <http://www.fosonline.org/wordpress/wp-content/uploads/2010/06/AdaptiveManagementTool.pdf>
 - Introduces the concept of adaptive management and outlines steps involved in using an adaptive management approach in conservation projects
- Foundations of Success is a small not-for-profit organisation that works with practitioners to learn how to do conservation better through the process of adaptive management. Their website hosts a number of freely available resources to inform and guide all stages of the adaptive management cycle: <http://www.fosonline.org/resources>





11.3 Using a community-based adaptive management approach

Community Based Adaptive Management (CBAM) is the same as adaptive management, except that communities specifically drive it. This means that communities guide all stages of management: from planning and design, to implementation, evaluation and revision. Given the community-driven nature of LMMAs, CBAM is the recommended approach to achieve long lasting and meaningful LMMA outcomes that incorporate community knowledge and needs.

CBAM allows for local in depth knowledge of marine resources to be incorporated into management plans, helping strategies be more sustainable by reflecting realistic social and ecological conditions. For example, in 2011, CBAM was used to review and reconfigure protected area boundaries and management rules within LMMAs in the Kubulau District of Fiji [1]. The new boundaries aim to strengthen the community's resilience to climate change by increasing representation of reef types and capturing more critical areas. In addition, local stakeholders expect compliance to increase due to the boundaries being simplified and more closely aligned with familiar natural features.

Unlike a set-and-forget, slow to change mentality to management, CBAM allows management strategies to be rapidly adjusted in response to changing environmental and social factors. Effective community-based adaptive management requires clear objectives, systematic

monitoring of progress, and flexible management structures that are able to incorporate new information as it arises. A community-based process is both the means and ends of CBAM. As such, CBAM can incorporate any number of participatory tools, and can identify any number of management outcomes (e.g. temporary fishery closures) as most appropriate for the community. The guidance presented in this Resource Kit is all intended for a CBAM approach; that is the community stakeholders carry out management themselves or at the least play a major role in the process.

It is important that community stakeholders understand CBAM and what this means for their role in the LMMA (see Stage 1 'Initial Assessment'). For example, it should be emphasised that CBAM is a process of learning by doing, and not to be disheartened if an approach does not work but rather focus on learning from the experience, adapting accordingly and improving strategies over time.



11.4 Useful resources:

- National and regional networks exist to support communities through all aspects of CBAM:
 - The MIHARI Network in Madagascar. Since 2012, Madagascar's LMMAs have been united within an informal network known as MIHARI, established to provide a framework for community exchange and dialogue to share local experiences of community-based natural resource management as well as training tools and resources. Over 150 communities are now members of the network, and community leaders meet annually in a national LMMA forum convened and supported by NGO partners in the country. <http://mihari-network.org> (see Stage 2: Chapter 5 'Exchange information').
 - The LMMA Network, working primarily in Asia and the Pacific, provides project information and useful resources: <http://www.lmmanetwork.org/>



12. Consider Impacts

Using a CBAM approach to LMMAs means it is necessary to consider the impacts of management actions, and how to measure them in order to adapt and improve the approach. When planning and designing these actions, and what to monitor, it is useful to think about the chain of events from action to impact, known as the “Theory of Change”.

12.1 What is Theory of Change?

During the first ‘Initial Assessment’ stage of LMMA creation, the problem statement will have been identified and a unified vision decided upon, i.e. why an LMMA is needed and what the desired outcome(s) of intervention is. Now that this vision has been decided upon, the pathways to fulfilling it need to be identified – known as the ‘Theory of Change (TOC)’. Put simply, at this stage you will know what the problem is [problem statement], you will know what needs to be different [vision], but now you need to decide how to achieve this [which strategies to adopt and how will they work?]. TOC can be considered a blueprint that illustrates how it is expected (or assumed) long-term LMMA goals will be achieved.

Considering the TOC at this stage of LMMA creation is recommended as it can bring multiple long-term benefits to the project:

- **Stakeholder communication**
Decisions regarding which strategies to adopt will be based on a series of assumptions, despite being grounded in local in-depth knowledge and scientific expertise ([Stage 2: Chapter 3 ‘Choose Management Tools’](#)).

These assumptions represent your TOC, and mapping these aids communication to all stakeholders so that they in turn can expect what the project is aiming for. Such communication of expected impacts is especially useful to maintain community enthusiasm for the project, to sustain government support, to meet funder requirements, as well as to address potential criticism.

- **Better preparedness**

It is very hard to know for certain in the beginning stages what impact management actions will have, it is likely that factors will be missed but that is part of the process of adaptive management – to learn by doing. Mapping the TOC involves conducting a ‘situation analysis’, which helps to identify as many threats, and causal processes as possible. This helps to make the project better prepared and more likely to succeed, by reducing the likelihood of unintended consequences of management actions.

- **Monitoring progress**

For a project to clearly show progress it is necessary to know what outcomes are expected, and how to measure their impacts ([see Stage 3: Chapter 4 ‘Monitor Impacts’](#)). This is part of a CBAM approach, with assumptions tested through a process of learning by doing, monitoring and measuring impacts and adapting accordingly. Working through the TOC provides the basis for identifying what needs to be measured and what indicators to use to show progress, to achieve long-term success through CBAM.

12.2 Developing a Theory Of Change

The TOC is the “development hypothesis”, the theory behind getting from ‘planned actions’ to ‘desired impacts’. The technical partners (NGOs) and the community develop the TOC together, during community consultations ([see Stage 1: Chapter 3 ‘Identify the Problem’](#)). It is vital that TOCs are devised with the community stakeholders to capture local in-depth knowledge. A good facilitator that really understands the theory and process is key; if a facilitator doesn’t quite understand the theory, then it is unlikely the community will understand and important local information might be missed.

Mapping the TOC into a diagram (developing concept models, identifying strategies/projects and expanding these into results chains, as described in the following steps) fleshes out the theory and provides a tool to organize Monitoring and evaluation efforts and to communicate the theory to stakeholders. Generally it is the technical partner that maps the TOC.



12.3 Useful tip!

The Conservation Measures Partnership (<http://www.conservationmeasures.org/>), together with Sitka Technology Group, has developed a software program called 'Miradi'.

Miradi is a user-friendly program that allows nature conservation practitioners to design, manage, monitor and learn from their projects to more efficiently meet their conservation goals, following the processes described by the Open Standards for the Practice of Conservation [2]. It includes diagramming software to help design concept models and results chains.

Miradi is popular among many conservation NGOs, including those partnering LMMA projects in Madagascar. Online information and tutorials on Miradi are available at www.miradi.org. It is likely that the LMMA technical partner will have staff members experienced in the use of Miradi and the development of TOC.





Step 1: Develop a concept model

A concept model illustrates the current state at the project site, identifying the main cause and effect relationships that are assumed to be working in the area. The main building blocks of the concept model will have been identified during the initial assessment stage – the problem statement, its causes and the unifying vision. The aim now is to map these in a diagram that links the building blocks (Figure 12.1).

■ Step 1.1: Consider the situation

Developing a concept model involves conducting a 'situation analysis', which helps to ensure a common understanding of the LMMA's context amongst stakeholders. Technical partners work together with communities to identify and agree on the relationships between the biological environment and the social, economic and political system that affect the resource issue (see [Stage 1: Chapter 3 'Identify the Problem'](#)). Depending on the project resources, the situation analysis can be an in-depth formal assessment of the resource and the area, or it can be a less-formal description of the situation based on local knowledge. Either, or both, is encouraged, given the significant benefits of understanding the local context for achieving LMMA success.

The arrows represent factors.

The **blue** arrows are direct threats, the **green** arrows are indirect threats and the **orange** arrows are opportunities. Each factor had one or more stakeholder associated with it

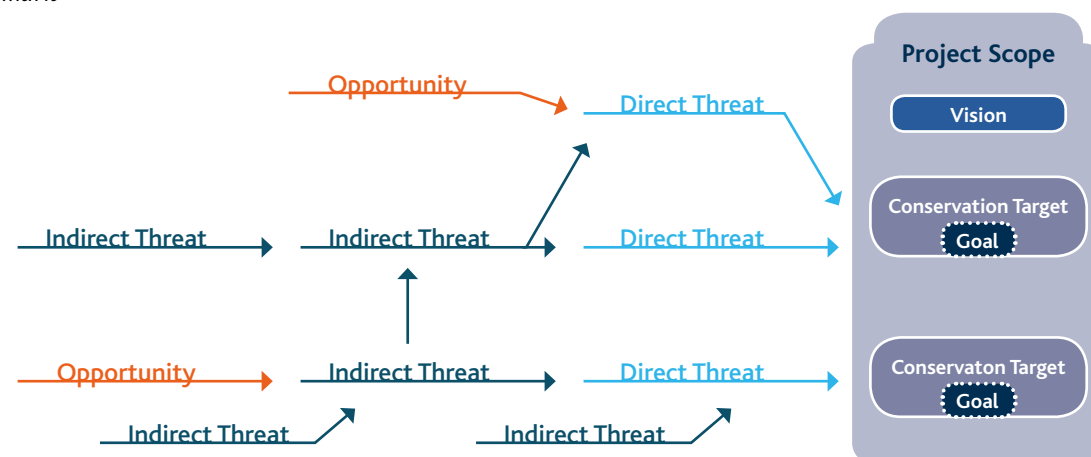


Figure 12.1 A generic concept model [Adapted from 2], Where:

Project Scope: Defines the broad parameters of the project, i.e. what it intends to affect. LMMAs are generally 'place-based' projects in that they have a geographic scope and include efforts to effectively manage priority resources in priority areas.

Vision: The ultimate state or condition the project is working to achieve (e.g. sustainable octopus fishing).

Conservation Target: Specific species, ecosystems or ecological processes that are the focus of the thematic project (e.g. Octopus cyanea or Coral reef habitat).

Goal: The desired status of the conservation target over the long-term. Goals are linked to conservation targets and are formal statements of the ultimate impact the project hopes to achieve (e.g. increase in catch size of Octopus cyanea).

Direct Threat: The factors that influence the condition of the conservation target. Primarily these are human activities that immediately degrade the conservation target (e.g. unsustainable fishing practices), but can be natural phenomena altered by human activities (e.g. increase in coral bleaching due to climate change). It is very useful to consider the spatial extent of the direct threat to ensure it is fully accounted for.

Indirect Threat: The root causes and drivers of the direct threats (e.g. demand for octopus, traditional consumer preferences, need to generate income, price of octopus).

Opportunity: A factor that potentially has a positive effect on one or more targets, either directly or indirectly. These might be thought of as the opposite of a threat, and can help identify entry points for management actions (e.g. demand for sustainable octopus fishing).



■ Step 1.2: Include human wellbeing targets

Given LMMAs are driven by a community desire for fishery management, it is useful to include the benefits of the conservation targets to people in the concept model, known as the Human Wellbeing Targets. Human wellbeing includes having necessary material for a good life, health, good social relations, security and freedom and choice [3]. Human wellbeing targets are the impacts on human wellbeing that the project will have, for example:

Improved livelihoods by increasing revenue from a fishery might be the human wellbeing target if the conservation target is *Octopus cyanea*, and a goal is to increase the size of the octopus catch.

OR,

Protection (of housing) from flooding or storm/cyclone destruction by reducing coastal erosion might be the human wellbeing target if the conservation target is mangrove forest, and a goal is to reduce mangrove loss.

In a concept model, the human wellbeing targets are mapped to the right of the conservation targets, achieved via a change in the delivery of the ecosystem service the conservation target affects (e.g. Food is a provisioning ecosystem service [3]). Including human wellbeing targets in concept models helps to illustrate and communicate the purpose of management for the communities, by showing the direct link between the management action and their improved wellbeing (Figure 12.2).

Step 1.3: Consider threats

Direct threats and indirect threats contribute to the resource problem, and it is these that need to be influenced in order to achieve the project visions, i.e. conservation actions will be designed to impact on and reduce the influence of these threats. By understanding these threats fully, actions – or strategies – can be more easily decided on. To help this, it can be useful to prioritise each threat to help concentrate strategies where they are most needed.

Threats should be identified during TOC consultations. When identifying threats it is helpful to question first 'what' is causing the resource to decline, to identify the direct threat. Then following this with the question 'why' is this happening to identify the underlying causes, i.e. the indirect threat. For example:

Q "What is causing octopus catch to decline?"

A "One problem is overharvesting"

Q "Why is octopus being overharvested?"

A "One reason is because of an increase in resource/users and fishers"

By continuing this line of questioning, further underlying causes/indirect threats can be identified, e.g.:

Q "Why are fisher numbers increasing?"

A "More people are migrating to coastal areas"

It is then helpful to classify direct threats with the communities into 'top threats', 'secondary threats', and 'future threats'. It is important to consider both the scale and extent of each threat, both geographically and the number of stakeholders associated with it. For example, unsustainable fishing practices might be identified as a direct threat to the resource during community consultation. However, this threat might not be limited to the LMMA community stakeholders, but also apply to migrant fishers that travel to the project site. To increase success, strategies will then account for these migrant fishers in their design.

A number of threat ranking exercises can help with these classifications, such as matrix ranking as described in [Stage 1: Chapter 3 'Identify the problem'](#). Additionally, the Miradi software has a tool that helps to grade threats based on their scope, severity and irreversibility ([see 'useful resources'](#)).



BOX 12.1 Population-Health-Environment (PHE) approach

If population growth relating to unmet family planning needs and lack of access to health services is identified as a threat, it may be useful to consider exploring partnerships with specialised health agencies like Marie Stopes Madagascar as a strategy for addressing this threat while supporting community engagement in marine management.

Blue Ventures' PHE toolkit is freely available to download and provides details of how to go about doing this: www.blueventures.org/phetoolkit, while the Madagascar PHE Network can facilitate learning exchanges with marine conservation organisations that have successfully integrated this "Population-Health-Environment" (PHE) approach into their LMMA initiatives: www.phemadagascar.org.

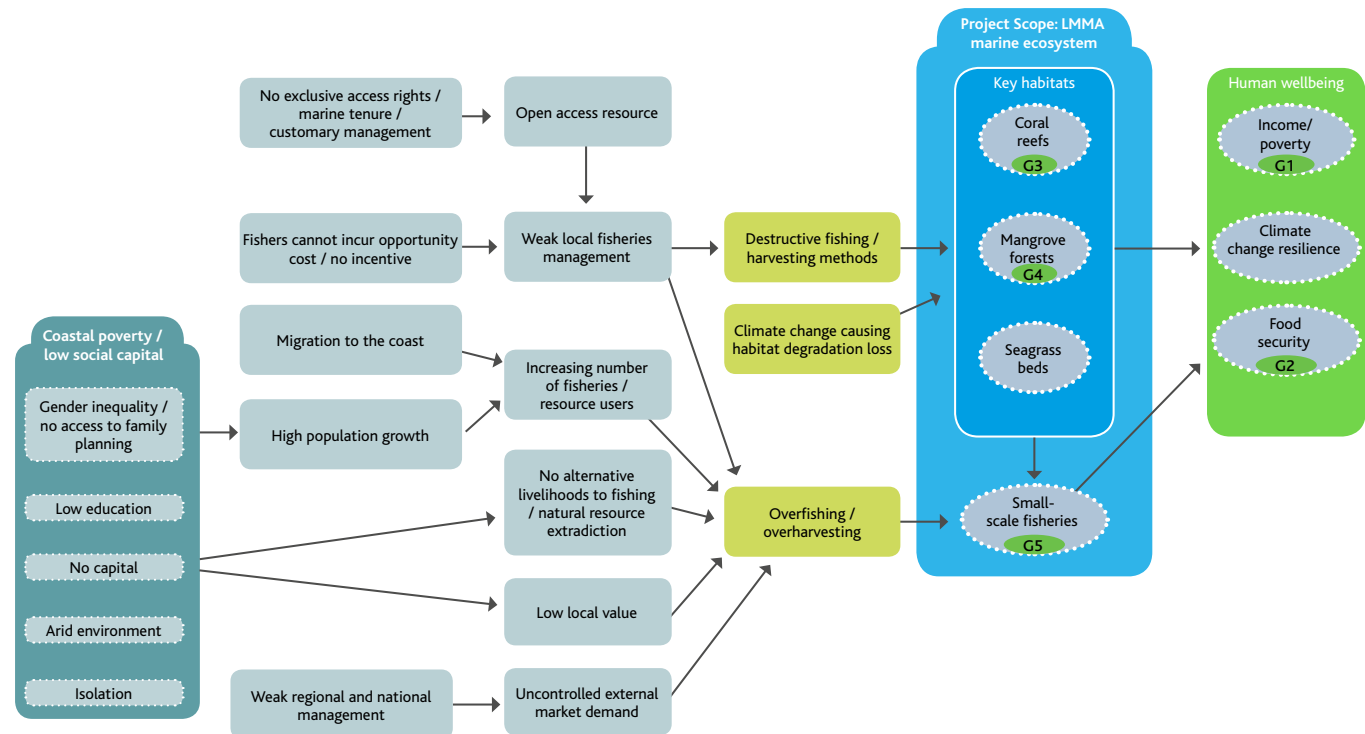


Figure 12.2 Example LMMA concept model, including human wellbeing targets.

G1-5 are Project Goals: G1=Household income in partner communities is maintained, increased or diversified; G2=Household income in partner communities is maintained, increased or diversified & Communities are food secure; G3=Increased reef health in LMMA protected areas; G4=Increased reef health in LMMA protected areas & Degradation and deforestation rates slowed; G5=Stock maintained at or above MSY.



Step 2: Develop results chains

■ Step 2.1: Identify and select strategies

Now that the concept model has defined the 'current state' at the project site, it is necessary to consider which strategies are going to be used to achieve the 'desired state' of the project site (the vision). There are a number of strategies communities might adopt to manage their LMMA. In short, strategies are designed to address the factors in the concept model that have been identified as contributing to the resource problem. Further information on strategy options and selection is presented in the following Chapter ([Stage 2: Chapter 3 'Choose Management Tools'](#)).

Step 2.2: Map the results chain

Once strategies are decided on, the pathways – or results chains – of how these strategies are expected to work need to be identified. Results chains are diagrams that illustrate a series of causal statements that link short-, medium-, and long-term results expected from the project, i.e. "if we implement [action A]... then we expect [Outcome B]" [4]. Each strategy will have its own results chain. Results chains can be considered expansions of concept models, from the current situation before a management action, to the desired situation as a result of a strategy. The basic building blocks are:

Strategy → Outcome → Outcome → Impact [4]
(Figure 12.3).

Results chains are particularly useful tools for illustrating explicitly how the management action is expected to achieve the desired outcome, and so help to communicate aims and intentions to stakeholders to encourage trust and support in activities ([Figure 12.4](#)).

In addition, mapping results chains helps the development of the project's monitoring plan that is essential for a CBAM approach. This is because defining short-term objectives helps to identify what to measure when monitoring progress of the project over time. Objectives can be readily converted

into measurable 'indicators' for monitoring, for example: the objective 'increase in percentage of rule infractions enforced' would involve measuring the number of rule infractions enforced at specific time periods (your indicator), and monitoring changes in this number over time. Further information on monitoring and indicators is presented in [Stage 3: Chapter 4 'Monitor progress'](#).

The concept model shows the "current state of the world"

Results chains show the anticipated results - the "desired state of the world"

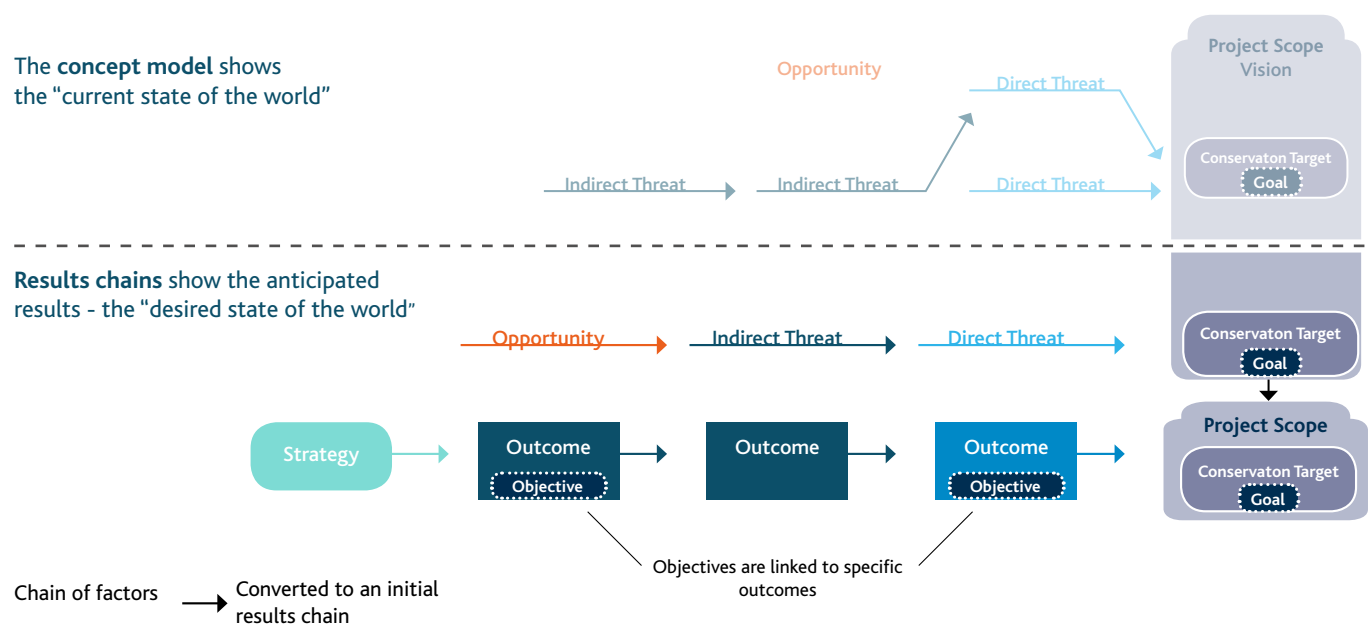


Figure 12.3 Example of a generic results chain, Adapted from [2]. Please see over the page for an explanation of the terms used



Figure 12.3 is an example of generic results chain, derived from the generic concept mode, where:

Strategies are the actions or interventions that a project implements (e.g. temporary closures).

Outcomes are the desired future state of a threat or opportunity factor (e.g. strengthen local management → sustainable harvesting).

Objectives are formal statements of the outcomes (or intermediate results) and desired changes that are thought to be necessary to achieve project goals. Objectives specify the desired changes in the factors (direct and indirect threats and opportunities) the project aims to achieve in the short and medium term (e.g. increase in percentage of rule infractions enforced).

Impacts are the desired future state of a conservation target, i.e. the desired end goals of the project (e.g. increase octopus catch size).

Step 5: Combine to represent TOC

In combination, steps 1 through to 4 represent your TOC: how it is assumed management actions will influence the current state at the project site to achieve the desired state at the project site. The next step is to test the TOC: once strategies have been decided, and results chains devised, management actions should be implemented and outcomes monitored over time ([see Stage 3 – Implementation](#)).

12.4 Useful resources:

- Margoluis, R. & Salafsky, N. (1998) Measures of success. Island Press.
 - Chapter 3 of this well-known practical guide for designing, planning and implementing conservation projects provides detailed guidance on developing conceptual models, identifying and ranking threats and improving concept models based on site assessment.
 - Excerpts of this resource in English are available online via Google eBooks, and the Spanish version is freely available via <http://www.fosonline.org/resource/measures>
- Govan, H., Aalbersberg, W., Tawake, A., and Parks, J. (2008). Locally-Managed Marine Areas: A guide for practitioners. The Locally-Managed Marine Area Network.
 - P25-26 provides a useful guide to matrix ranking (threat ranking) exercises.
- The Conservation Measures Partnership (2013) Open Standards for the Practice of Conservation. Version 3.0.
 - Chapters 1&2 (p9-28) presents detailed guidance on developing concept models and the use of results chains to identify management actions.
 - Freely available to download via <http://cmp-openstandards.org/>
- Foundations of Success (2007) Using Results Chains to Improve Strategy Effectiveness. An FOS How-To Guide.
 - This 15-page document provides clear and detailed step-by-step guidance on developing and using results chains for project planning and design.
 - Freely available online via <http://www.fosonline.org/resource/using-results-chains>
- Foundations of Success (2009) Conceptualizing and Planning Conservation Projects and Programs. A Training Manual.
 - A useful training manual for applying the Conservation Measures Partnership's Open Standards for the Practice of Conservation.
 - Pages 44-55 provides specific guidance on threat ranking exercises.
 - Freely available online via <http://goo.gl/tiW1Bm>
 - Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources of the Department of Agriculture, and Department of the Interior and Local Government (2001) Philippine Coastal Management Guidebook Series No. 3: Coastal Resource Management Planning. Coastal Resource Management Project of the Department of Environment and Nature Resources, Cebu City, Philippines, 94 p.
 - Chapter 4, p49 provides guidance defining goals and objectives
 - Available online: http://oneocean.org/download/db_files/crmguidebook3.pdf

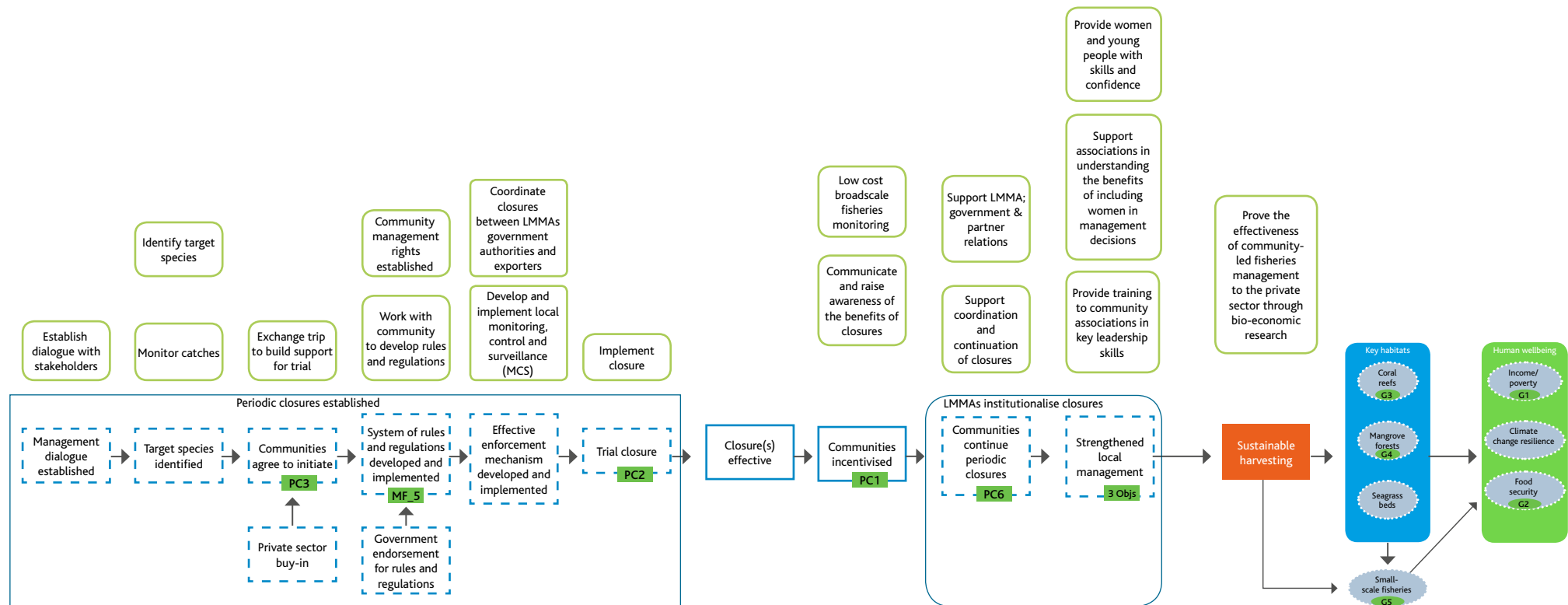


Figure 12.4 Example LMMA results chain.



13. Choose Management Tools

13.1 Which strategy?

As described in the preceding chapter, strategies – or management actions – are designed to address those factors that have been identified as contributing to the resource problem. These factors will have been identified during community consultations, and in many cases their solutions will likely be logical, e.g. if poison fishing was identified as the root cause of fishery decline, then a ban on the use of poison will be a strategy to adopt. Although not strictly necessary, concept modelling will aid the selection of strategies by illustrating the situation in the project area, thus helping to isolate these factors. Strategies should be identified with the communities through consultations, using a similar line of questioning as described for identification of threats in the previous chapter.

There are a number of strategies that management can adopt to address the causes of the resource problem, for example [5]:

- Permanent or temporary no-take zones (NTZs)/reserves
- Ban destructive fishing practices (e.g. use of poisons/ dynamite/coral smashing)
- Establish size limits for the catch (only where catch methods are selective and undersize animals can be returned to the sea unharmed, e.g. there might be little point in establishing size limits for sharks as they often die caught up in the net before fishers pull them in)
- Ban catch of larger, older female fish (Big Old Fat Female Fish - BOFFF hypothesis)

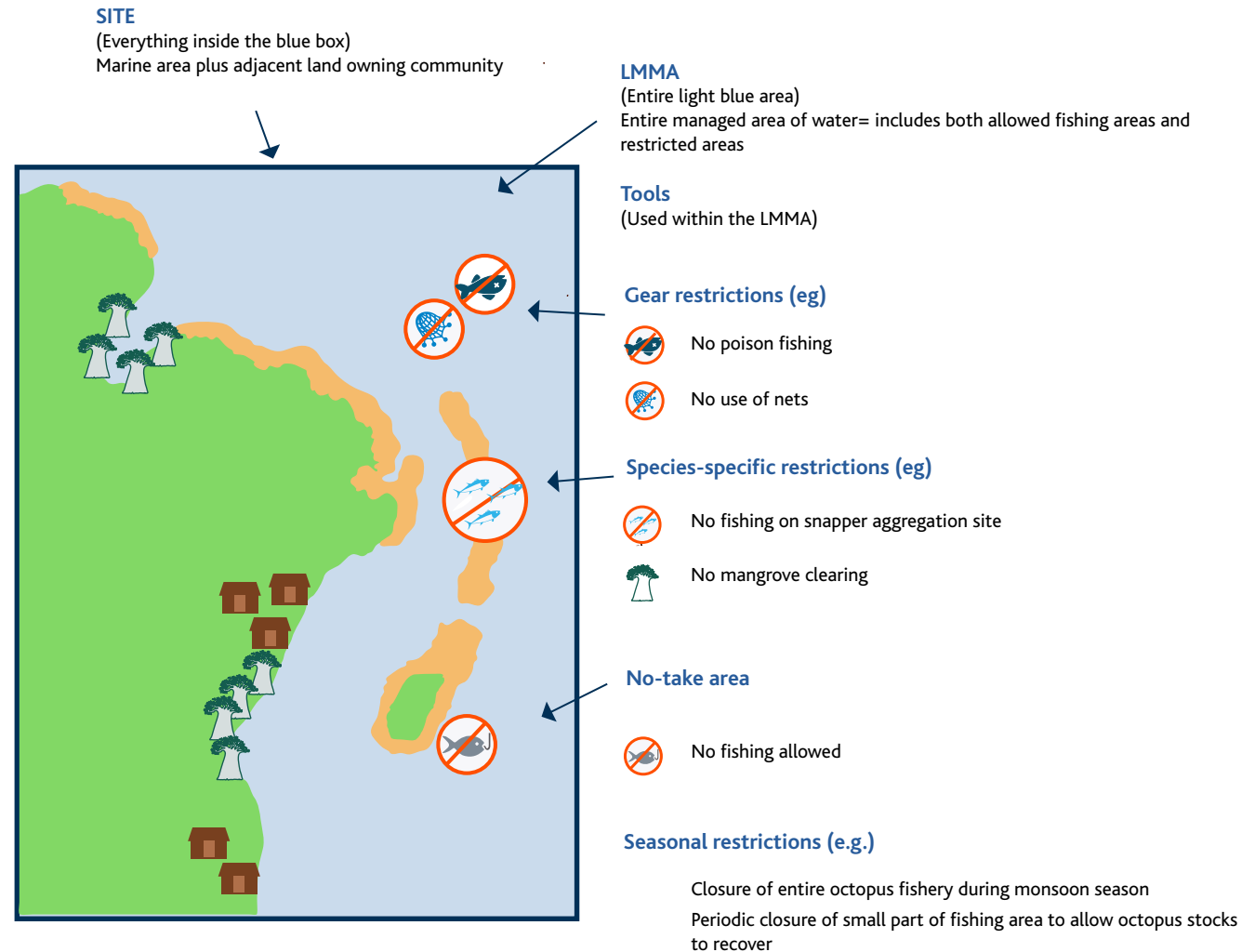


Figure 13.1 Illustration of a potential LMMA project area and management tools used adapted from [5,6]



- Establish catch limits/quotas
- Ban gill netting or replace with more discriminate trapping methods
- Establish minimum mesh sizes for fishing nets
- Ban harvest of very rare species (e.g. turtles)
- Ban discarding of rubbish/pollutants into the sea
- Seasonal bans on species, e.g. during breeding season
- Protect Fish Spawning Aggregations
- Mangrove forest restoration/management
- Alternative livelihood initiatives

Typically for LMMAs, the overall management approach is to create a reserve with designated no-take zones that are either permanent or temporary. Other management tools might then be adopted in addition to this general approach, such as specific bans on species caught/gear used or others listed above (Figure 13.1). For the purposes of this Resource Kit we present in more detail the four most common LMMA management tools adopted in Madagascar, either used as stand-alone tools or in combination:

1. [Permanent reserves or temporary closures](#)
2. [Fishing gear restrictions](#)
3. [Alternative livelihood initiatives e.g. aquaculture](#)
4. [Mangrove forest restoration/management](#)

When considering which strategy to adopt, there are a few key principles to keep in mind:

The communities should decide which approach is most appropriate for their site. While the technical partner (NGO) can make suggestions, it is best not to overwhelm communities with a long list of potential options. Instead, discuss the resource problem during further community consultations, and let the decision arise with consensus amongst the group. Take into account local knowledge of target species, as well as traditional management practices that might be customary in the area, such as temporary bans on fishing. Ultimately the community will need to give full backing to the strategy adopted, if they are to comply with its rules, e.g. implementing a fishing ban that the communities do not agree with will likely have little effect, and may only cause conflict rather than present a solution.

Communities will need training in knowledge and concepts essential to natural resource management, such as species biology and ecosystem functioning, preparation of work plans and budgets, monitoring methods, legal definitions and assistance with conflict resolution mechanism. The technical partner should provide this through targeted workshops that include real-life examples and practical exercise. Supporting materials in the local language (such as posters or factsheets) should be provided and follow-up meetings conducted to ensure information was understood and new skills implemented. Educational outreach improves local awareness, and can be achieved through plays and films and environmental clubs.

Consider what has happened elsewhere in the region/ country and use that as an example. LMMAs are not new; Madagascar has over 65 LMMAs (as of 2015) that can be examined to provide examples of which tools work where and why, and also perhaps those that did not work. Reach out to national or regional networks (e.g. MIHARI network in Madagascar, the LMMA network in Asia and the Pacific) for advice and training, and to learn from shared experiences. In addition, conducting peer-to-peer exchanges with established LMMA communities ([see Stage 2: Chapter 5 'Exchange information'](#)) can help to provide practical examples of management tools already used elsewhere, and address any doubt that the community might exhibit.

Ensure the approach is feasible in terms of available resources. This includes the technical resources it requires (i.e. specialist equipment, e.g. boundary marker buoys), human resources required (i.e. personnel required to effectively implement, e.g. number of people needed monitor the LMMA and specialist training required) and financial resources (i.e. the operational costs of the LMMA, e.g. the cost of education/outreach programs). This is especially important to consider given the long-term aim of a self-sustaining LMMA that does not rely on external support. Where possible, learn from communities and use local methods and local tools, as specialist equipment is costly to provide and repair, and try not to encourage a culture of expectancy such as through use of per diems without careful consideration first ([see Stage 1: Chapter 4 'Key Principles of LMMAs'](#)).



Continue to communicate with other stakeholders to maintain their support.

Government/political support for the adopted strategies will aid the project such as by providing legal support, or assistance with enforcement. In addition, having the backing of commercial stakeholders is very important for project success and is key to helping measures such as periodic closures succeed. For example, if the NTZ is targeting a commercial species such as octopus, commercial buyers and seafood collectors will need to be aware that active fishing grounds are being closed, as it might result in a temporary decrease in supply and preparations to process large amounts of seafood on a successful opening day will need to be made. In addition, ensuring tourist operators in the area are aware of the NTZ might help raise funds for the LMMA by promoting the site to tourists.

13.2 Useful resources:

- Govan, H., Aalbersberg, W., Tawake, A., and Parks, J. (2008). Locally-Managed Marine Areas: A guide for practitioners. The Locally-Managed Marine Area Network.
 - p33-35 presents a number of possible management strategies that might be useful for LMMA, and goes on to discuss NTZs in detail.
 - The Conservation Measures Partnership (2013) Open Standards for the Practice of Conservation. Version 3.0.
- Chapter 2A, p18-21 discusses the selection of strategies based upon 'key intervention points' using a concept modelling approach.
- Department of Environment and Natural Resources, Bureau

of Fisheries and Aquatic Resources of the Department of Agriculture, and Department of the Interior and Local Government (2001) Philippine Coastal Management Guidebook Series No. 3: Coastal Resource Management Planning. Coastal Resource Management Project of the Department of Environment and Nature Resources, Cebu City, Philippines, 94 p.

- Chapter 4, p51 discusses management strategies and action plans.
- Available online: http://oneocean.org/download/db_files/crmguidebook3.pdf
- Secretariat of the Pacific Community (2011). Guide to information sheets on fisheries management for communities. Coastal Fisheries Programme.
 - This resource includes a set of species-specific factsheets detailing life cycles and their management methods (including octopus and sea cucumber).
 - Freely available online: <http://www.spc.int/coastfish/en/component/content/article/393-guide-and-information-sheets-for-fishing-communities.html>
- Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources of the Department of Agriculture, and Department of the Interior and Local Government (2001) Philippine Coastal Management Guidebook Series No. 6: Managing Municipal Fisheries. Coastal Resource Management Project of the Department of Environment and Nature Resources, Cebu City, Philippines, 122 p.
 - Chapter 2 provides very useful information on the fundamentals of fisheries management and applications, including the ecology of species, coral reef ecology, mangrove ecology and fishing gear impacts.
 - Freely available online: http://oneocean.org/download/db_files/crmguidebook6.pdf

- Blue Ventures has written a number of factsheets detailing their holistic approach to LMMAs:
 - Rebuilding tropical fisheries with coastal communities (2015) Blue Ventures Conservation: <https://blueventures.org/publication/rebuilding-fisheries-factsheet/>.
 - Locally led marine conservation: Putting communities at the heart of marine management. 2015. Blue Ventures Conservation: <https://blueventures.org/publication/locally-led-marine-conservation-factsheet/>.
 - The community catalyst model: Sparking and sustaining locally led marine conservation. 2015. Blue Ventures Conservation: <https://blueventures.org/publication/catalysing-conservation/>.
- Blue Ventures has created 12 handbooks on specific aspects of the LMMA approach that include both technical guidance and descriptive comics aimed at community members, in Malagasy, French and English.
 - Handbook Two, "Western Indian Ocean Habitats" provides an overview of the habitat types in the WIO useful when considering their management.
 - Handbook Five, "Octopus Fishery Management" provides an overview of octopus-specific management tools, with a focus on temporary closures.
 - Handbook Six, "Coral Reefs in the World's Oceans" provides useful educational information that describes the basic functioning of the marine ecosystem.
 - Handbook Eleven, "Marine Turtle Conservation" introduces the importance of turtles and presents management approaches for their protection.
 - These handbooks are freely available: <http://mihari-network.org/how/>



13.3 Permanent reserves or temporary closures

Reserves/closures (or No-Take Zones; NTZs) are coastal or marine areas that have been either permanently or temporarily closed off to fishing (and in some cases all entry/activities such as swimming/boating).

NTZs are a common LMMA management tool because they are relatively cheap and simple to implement, yet yield multiple benefits. Such benefits include [5]:

- **Improved habitat and increase in size and number of fish and other marine life.**
The reduction/termination of disturbance during closure yields quick benefits such as: the habitat within the NTZ improves (e.g. corals respond well to not being walked on), (fast-growing) fish increase in size, and species diversity often increases due to marine life (e.g. turtles) entering the area to benefit from the improved habitat and larger fish.
- **Increased fish catch in nearby fishing areas.**
About 2-5 years after establishment the increased size and number of fish and other marine life begins to 'spill over' into nearby fishing areas, improving catch in those areas.
- **Allowing fish and other marine life to reach reproductive size.**
Given the protection afforded in the NTZ, fish and other marine life have a greater chance of reaching maturity and reproducing. Offspring will then either stay in the NTZ or reach new areas, depending on the species life

history, tidal currents and water circulation, growing the population of the NTZ and/or seeding new areas outside it.

- **Restoring critical spawning densities**
Many sedentary or slow-moving marine animals (e.g. clams and sea cucumbers) cannot travel to find mates, but reproduce by releasing eggs and sperm into the water during coordinated events such as moon phases. A critical spawning density of animals is required for this mechanism to be successful, as otherwise animals are too far apart for the sperm and eggs to meet. If animals fall below this density, it can be easy for populations to crash. NTZs help to preserve this critical density, and thus the species, through reduction or termination of disturbance.

The choice of whether to establish a NTZ that is permanent or temporary is really down to the community. Temporary closures are most useful for fast-growing species that will benefit from short bursts of protection, whereas permanent reserves are suited to most species.

Communities themselves may have a preference for the length of protection, whether permanent or temporary, depending on the LMMA objectives. Although, the approach can be flexible, and temporary closures can become permanent reserves if communities change their mind.

NTZ design should be based on sound science, yet must also complement the communities needs to be effective. That is, NTZs must be within communities' capabilities, while science may identify a particular area for a NTZ there is little point in designating it so if communities do not agree.

When planning and designing a NTZ there are a few key principles to consider, and these need to be discussed with and agreed on by the communities concerned:

Select the target species

- Temporary closures are suitable for target species that are short lived and fast growing, as clear benefits of NTZs to catch size can be realised quickly (e.g. octopus double in weight every month). However, slower-growing species can also be managed through the use of temporary closures, only communities will have to wait longer to benefit from protection. Permanent reserves are suitable for most species, depending on their size and home range and the size of the reserve.
- If possible, an economically important species ensures financial returns on temporary closure opening days, and provides an incentive for complying with the NTZ and continuing with the approach.
- NTZs should encompass suitable habitat for the target species.

Location of the NTZ

- Ideally NTZs should be placed near villages so that they are easier for communities to watch closely, access and patrol. If not possible, an area with frequent traffic of people would help with the issue of keeping watch, i.e. an area people pass frequently on their way to fishing grounds or neighbouring villages.



- Boundaries should be decided by the village to account for local knowledge of the area (such as local landmarks), to ensure boundaries are easily recognised and respected. Ideally boundaries should also be marked using signs and buoys, so that they are prominent to both the communities involved and neighbouring communities. This minimises confusion in location, meaning rules and regulations are more likely to be respected. However, buoys can be expensive to acquire and so if resources are not available devise a suitable replacement with the community, something they think will be prominent to both community members and outsiders.
- Beyond targeting a specific species, selecting an area with a variety of habitat types (e.g. coral reef, seagrasses, seaweeds, mangroves) will provide added benefit for a variety of other species that move between habitat types during different stages of their life cycle.

Size of the NTZ

- NTZs should be big enough (if possible, at least 20% of the fishing ground) to produce benefits to the local fishery. In addition, in the case of temporary closures, larger NTZs are better suited to handle the often-large number of fishers who attend an opening day.
- However, NTZs should not be so big that villagers cannot afford to forego use of the area while it is closed.
- When choosing mangrove areas, many villages like to choose areas with permanent ponds that don't completely dry out at low spring tide.
- NTZs should also be big enough to capture the target species sufficiently, for example if the species is highly mobile a small NTZ might not contain sufficient number, or, in the case of permanent reserves, if the species travels

to/congregates in other sites for feeding or spawning a small reserve will not be effective in protecting them in these areas. Temporary closures can be used to protect species during spawning or other aggregation events, however be sure that opening periods do not fall during these times.

Timing of the NTZ (Temporary closures only)

- The length of the closure period will vary depending on the life history traits of the target species. Temporary closures are generally best used for fast-growing species and should be timed with periods of rapid growth in the life history of the species.
- Decide what tide the opening day should occur on, whether spring, neap, high or low. This will also depend upon the target species and their movements. This is very important, and needs to be discussed at length with fishing communities.
- Consider seasonality: seasonal variations in target species abundance, fishing activity and resource use may mean particular areas are only suitable for NTZ establishment during certain times of the year. Seasonality also applies to weather seasons, i.e. it might be best to avoid the wet season due to inundation of rain on opening day. It is also important to consider any existing national or regional fisheries closures (e.g. seasonal closure of shrimp), as this can have legal and economic ramifications for the NTZ.
- Use a tide table to choose an opening date, and then count backwards the length of the NTZ from the opening date to determine the closure date.

Consult with commercial seafood buyers

- Discuss and plan the NTZ location, target species and timing with this stakeholder group to ensure their support.
- Unsupportive commercial buyers might encourage fishers not to respect the NTZ or refuse to buy catches from NTZ-implementing villages. Supportive buyers can aid success by helping to prevent/report poaching, and providing a price incentive for fishers on opening day.
- Supportive buyers need to be ready to process and store the expected high volume of seafood on opening day.

Rules and regulations of the NTZ

- Rules and regulations of the NTZ need to be decided on through meetings with the communities. Participation by as many people as possible should be encouraged to ensure a high level of community ownership and support. If the rules and regulations are not widely agreed upon as fair, they will be difficult to enforce ([see Stage 3: Chapter 3 'Enforce Rules and Resolve Conflict'](#)).
- Once agreement is reached, a Dina (Madagascar specific customary laws) should be created to formalise the rules and regulations ([see Stage 2: Chapter 4 'Consider legal options'](#)).
- Fines for breaking the rules and regulations should be an amount that is realistic for fishers to pay, but large enough to effectively discourage non-compliance. Tiered fines, where the amount increases if offences are repeated, are a useful approach to enforcing rules and regulations ([see Stage 3: Chapter 3 'Enforce Rules and Resolve Conflict'](#)).



- It is important to determine procedures for enforcement of the Dina at the time of its creation, to avoid future delays/and or confusion if an infraction is observed ([see Stage 3: Chapter 3 'Enforce Rules and Resolve Conflict'](#)).
- The use of Dina is familiar in Madagascar and there are often established procedures for their enforcement. Where possible it is best to follow these procedures rather than work against them.



Raising awareness for the NTZ

Once the NTZ regulations and Dina are decided upon, it is important that information is shared as widely as possible. If multiple villages are included in the LMMA, and a few individuals represent each village, it is not safe to just assume information will be adequately and accurately relayed to their home villages. Instead, assign the individuals specifically with the task of informing their villages of the NTZ and its regulations. Follow this up with a visit to the village to ensure this has been done, and to gauge the village's reaction. If a village has a particularly negative reaction to a decision that was made, it is important to address this as soon as possible so that it does not lead to a larger conflict that might render the NTZ ineffective and affect communities' ability to work together.

Some methods of disseminating information regarding decisions made in NTZ planning meetings that have proved effective are as follows:

- By written letter to the Fokontany President or Chef de Village in all concerned villages. It is their duty to pass information to their village. However, it is important to first ensure these leaders are themselves well informed regarding the NTZ, its purpose and its regulations, so that information is conveyed correctly.
- Radio announcements are a useful tool. These can be as short as 90 seconds, are relatively cheap, and reach a very wide audience. In addition to improving awareness of decisions that have been made, radio messages also have the added advantage of exposing new communities to the idea of NTZs, and may generate additional interest. It is

helpful to first inquire about what radio stations are the most widely listened to in the target villages, and what time of day most people listen to the radio.

These approaches assume the communities are already familiar with the concept of the NTZ and the reasons for creating the LMMA. Community consultations are vital to ensure full community understanding for, and compliance with, the LMMA. If this is not the case refer to [Stage 1: Chapters 2 'Engage stakeholders' and 3 'Identify the problem'](#).

Finally, the NTZ will likely need physical demarcation, which generally takes the form of available signs or markers, placed strategically around the NTZ. At entry points the signs should ideally state the name of the area, the closure/opening date, and that no entry is allowed during the closure times. As not all fishers may be literate, use a colour, such as red, that will indicate that the area is off limits. Communities sometimes choose to also list the fine amount for breaking the rules and regulations on their NTZ signs.

Planning for NTZ closure

Planning for closure should begin as soon as possible, but at a minimum it is best to begin planning two months before closure if possible. Consider at length logistical factors, such as:

- Construction of boundary signs: decide and assign responsibility for purchasing the materials, building and installing the signs (if resources allow).
- Assess whether tradition requires a ceremony ("fomba") to be performed. If so, identify who is responsible to



conduct the ceremony and the purchase of necessary materials. For example, the NTZ area “Andopingo” in Belosur-Mer is sacred to members of the Marofihitse village, and thus necessitated the killing of a goat. To achieve this, each household contributed a small amount of money to raise the funds needed to buy the goat.

- Ensure a clear communications plan exists for all of the surrounding villages, and that there is follow-up to ensure it is carried out before the closure (see above). This should commence as soon as possible to ensure widespread delivery of the information.
- Ensure agreement within and between communities regarding NTZ rules, for example whether gear restrictions will be implemented. Reaching agreement on the rules and regulations and enforcement procedures of the NTZ is vital for everyone to be able to respect them.

Planning for NTZ opening (Temporary closures only)

Opening days can be very exciting, and also very chaotic. If not well organized, they can cause conflict within and between villages as well as feelings of being cheated, and discourage the establishment of future NTZs.

Opening day procedures should be established well in advance, and with the participation of all concerned villages. They should be well communicated, so that everyone understands the rules and it is easy to enforce a fine on anyone not adhering to the regulations. If possible, it is beneficial to conduct simple monitoring of catches on opening day, to provide rapid feedback to communities on the effectiveness of their NTZ. The following key points should be considered when planning an opening:

- For fairness, it is best to have one starting point so that everyone is equidistant from the NTZ when it opens. One person should be in charge of announcing when the NTZ is officially open, and this announcement or signal should be clear.
- Consider whether rules are required regarding fishing gear used on opening days, so that individuals who cannot afford expensive and more effective fishing gear are not at an unfair disadvantage. Openings could be staggered by gear type, or gear could be shared within community or a ban on certain gears could be implemented.
- Special rules may be required for special gears. For example, it may be decided that crab fishers using hooks and bait are allowed to enter the NTZ first at high tide, with net fishers following a couple of hours later as the tide recedes.
- If an opening ceremony is to be performed, ensure adequate time has been allotted for this, and also that the performers have adequate time to prepare to fish after the ceremony if they wish to do so.
- If catches are to be monitored, make sure that weighing stations are established, monitors are prepared, and fishers know they are expected to pass by weighing stations before returning home.
- If production is expected to be high, coordinate with seafood collectors so that they are prepared to buy and preserve large amounts of produce on the opening day.

Potential NTZ pitfalls, and solutions

Though community-managed NTZs are relatively low-cost and easy to implement, they face a number of challenges. Seeking solutions to the challenges encountered is an on going process, and part of a CBAM approach. Pitfalls identified so far, and their potential solutions, are presented below:

- **Too many people attending an opening day (Temporary closures only)**
NTZ openings can attract “free riders”, these are individuals who would not normally fish in the area, and thus have not sacrificed fishing behaviour during the closure period, but attend the opening to take advantage of the increased catches. The issue of free riders is especially difficult to tackle in western Madagascar, due to the traditional vezo belief of open access for all to marine resources. Nevertheless, if NTZ-implementing communities are not able to enjoy the full benefits of their efforts, they may become discouraged and reluctant to implement future NTZs.

One potential solution to this problem is to work with multiple villages throughout the area, and coordinate NTZ openings. This will have the effect of reducing the number of potential free riders, as they will have their own NTZ to attend.

Another potential solution is to establish local user rights, defining who is allowed to fish in the NTZ upon its opening, and when open-access rights will again be granted.



A third idea is to implement access fees, so that free riders would make a monetary contribution to the NTZ management.

Finally, though it is important to share information throughout stakeholder villages, the broadcasting of opening dates via radio may encourage free riders to attend the opening. Therefore, opening dates could potentially be omitted from radio announcements regarding temporary closures.

■ NTZ benefits not shared equitably

Closely related to the problem of too many people fishing on an opening, can be the problem of some individuals having more effective, and usually more expensive, fishing gear enabling greater catch success on opening days. This can unfairly disadvantage the poorer members of the community, reinforcing their poverty, keeping potential benefits from those who may need it most, and potentially straining community relations. It is important that this issue is considered during the planning phase.

Potential solutions may be the banning of specific gears or techniques upon the reserve opening, the staggering of access upon opening, or the sharing of gears within the community. These should all be discussed prior to NTZ closure, to allow for enough time for everyone to know the rules and adhere to them on opening day.

■ Financial sustainability

Another challenge to the long-term sustainability of NTZs is their finance. While NTZs are not overly expensive to implement, they do involve some small costs, such as food and/or perhaps financial compensation (per diems, if you have decided to award them) to attend meetings far away, the construction and maintenance of signs and marker buoys, and expenses to conduct closure and opening ceremonies.

Some potential ways to generate revenue for the association to cover these costs are the following (also see [Stage 4: Chapter 3 'Sustainable Financing'](#)):

- Monthly or annual contributions/subscription by association members
- Payment of flat access fees to fish at openings
- Introduce a contribution scheme that is decided on collectively, i.e. a small flat fee is charged to all fishers on opening day, or the fee is charged based on catch size (i.e. a contribution of 50 Ar/kg of produce caught), or based on target species.
- Financial or in-kind contributions by commercial buyers. Commercial buyers, though they may not be involved in the actual management of the NTZ, benefit from efforts to ensure the sustainability of fish stocks, and so are likely to be willing to contribute to effective management initiatives.





13.4 Useful resources:

- Govan, H., Aalbersberg, W., Tawake, A., and Parks, J. (2008). Locally-Managed Marine Areas: A guide for practitioners. The Locally-Managed Marine Area Network.
 - p35-39 presents detailed information regarding the benefits of reserves, important considerations for reserve design and guidelines for setting up reserves.
- IUCN (2004) Managing Marine Protected Areas: A Toolkit for the Western Indian Ocean. IUCN Eastern African Regional Programme, Nairobi, Kenya. p. xii + 172pp.
 - Sheet C2 provides guidance on reserve design and zonation
 - Freely available online:
https://cmsdata.iucn.org/downloads/mpa_toolkit_wio.pdf
- Secretariat of the Pacific Community (2011). Guide to information sheets on fisheries management for communities. Coastal Fisheries Programme.
 - A set of factsheets detailing fisheries management measures in the Pacific including community-managed NTZs. While specific to the Pacific, general information is of global relevance. Provides useful guidance on questions to ask communities when establishing a reserve as well as species-specific factsheets detailing life cycles and management methods (including octopus and sea cucumber).
 - Freely available online: <http://www.spc.int/coastfish/en/component/content/article/393-guide-and-information-sheets-for-fishing-communities.html>





CASE STUDY BOX

Zoning the Velondriake community-managed Marine Protected Area (CMPA)[7]

In Velondriake, communities and their technical partner Blue Ventures (BV) piloted the use of three complementary methods when designing the reserve.

- Three-dimensional habitat mapping using acoustic and remote sensing techniques.
- Detailed participatory habitat and resource-use mapping, combined with participative analysis of the pressures on these resources, carried out by community members.
- Scientific surveying and monitoring of fisheries and habitat status by marine scientists together with trained community members.

Four different 'zones' were designed within the overall reserve, each implementing different management tools as defined by the Velondriake Dina and management plan:

1. The village user zone, where traditional fishing is permitted but destructive techniques are banned.
2. Temporary NTZs, sites that are temporarily closed to fishing for a minimum of two months and included reef flats and mangroves.
3. Permanent NTZs, which are permanently closed to any extractive activity and include patch reefs, and mangrove and baobab forests.
4. Special use areas, for aquaculture and to protect areas for their natural beauty and landscape value.

Villagers chose a nomenclature for the different management areas that reflected the resource or habitat being managed, or the principal use of that habitat, as follows:

- 'Octopus reserves' - Temporary NTZs established on known octopus gleaning sites - typically reef flats. All fishing, not just octopus fishing, is prohibited during its closure.
- 'Fish reserves' - Permanent NTZs on recognised fish fishing sites, typically lagoonal patch reefs.

- 'Mangrove reserves' - Permanent and temporary NTZs in mangrove sites where villages fish crab, shrimp and fish.

Reserves were placed in well-defined reef flats or mangrove fishing areas that were already delimited fishing areas well known by all fishers. This enabled villagers to readily select the reserves and to implement the closures. After implementation, participatory monitoring and evaluation of the fishing benefits of the reserve (see Stage 2: Chapter 4 'Monitor progress') allowed the reserve sites to evolve to reflect the most ideal locations over time. This was possible in a relatively short time frame due to the short turnaround of the temporary closures, as part of a CBAM approach.

Through a participatory mapping process, each village in the CMPA laid the foundation for the community to move from simple temporary NTZs to a zoning of the CMPA that also included permanent NTZs. Villagers defined key habitats, determined where they were and their species diversity, what key resources they provided, their condition and uses and problems with them. The maps were also used to identify key conservation priorities, such as fish spawning aggregations, turtle nesting sites and cultural/spiritual sites.

BV georeferenced the results of these participatory maps by printing large official maps showing the outlines of the coastline, reef flats and mangroves. Participants then transferred their defined areas onto this map. These combined maps then formed the basis for the eventual definition and community negotiation of the zoning plan.

The participatory maps were found to agree well with the habitat map derived from remote sensing, in that they represented well the location and distribution of key habitats. On the basis of these maps, and the information they provided on habitat quality and resource use, BV chose the coral reefs, seagrass and mangrove areas for ecological surveying. The location of the MPA was based on technically advanced scientific data measured and analysed by BV. However, these locations were presented to the Velondriake Management Committee, who evolved it further with all community members to gain broad-based support and ownership of the final design through a series of village tours and meetings.

Lessons learnt during the zoning process include:

- In some instances the majority of the community wanted to set aside certain resources as permanent NTZs; however, a vociferous minority prevented them from doing this. The end result of trying to reach a consensus was not democratic; and it was decided mechanisms that ensure that the majority's interest is protected are needed.
- There was discrepancy between what scientists know what will succeed as a MPA design and what the community is prepared to do, necessitating compromise.
- The community's decisions as to where NTZs will be placed is not taken on the basis of what scientists know to be right; it is taken on what the community is willing to do and scientific expediences are not at all a priority.
- The significant time and expense spent zoning an MPA scientifically would be much better spent on getting the community to establish NTZs that meet basic requirements in terms of habitat health without delay. The community and supporting NGO could then evolve the MPA design as community support builds.
- That scientific data complements participative appraisal and traditional ecological knowledge, and is necessary to validate local knowledge.
- Mostly this experience highlights the vital importance of community participation in monitoring of their coastal resources, for a number of reasons:
 - To bridge the gap between scientists and the community;
 - To enable the community to accurately access changes in the state of their resources;
 - Crucially, to enable them to adapt their management regime with respect to the realities they will face during implementation (CBAM).
- It is only through this process that reef-dependent communities will consider closing reefs that, inevitably, will be the most productive fishing sites that remain to them.



13.5 Fishing gear restrictions

Gear restrictions are applied to types of fishing gear, specific gear characteristics and/or the use of certain gear that are deemed damaging or lead to overfishing. This includes [8]:

- **Outright bans** are sometimes placed on certain types of fishing gear that may have been identified as too efficient, i.e. catching an unsustainable amount of the target species or not discriminatory enough in their catch type, i.e. catching vulnerable/critical species such as gill nets, or identified as too destructive such as poison fishing.
- **Regulations on gear characteristics** are common; such as minimum mesh size or dimensions of mouth opening of nets or traps. Such regulations are often implemented to avoid catching juveniles of target species and/or to avoid by-catch of other species.
- **Certain equipment** might be prohibited that otherwise eases fishing capacity, e.g. in some Malagasy villages there is a desire to ban the practice of covering torches with condoms to waterproof them to allow for night diving for sea cucumbers, lobsters and other species.
- **Restrictions on the use** of certain fishing gears, such as restricting certain gear use during particular times of the day/night or season that might be important for the life history of target species (e.g. spawning events) or restricting the number of gear types any one person can use at a time, or restricting the area in which certain gear types can be used (e.g. juvenile nursery sites).

Gear restrictions tend to be species specific, and so might have consequences for by-catch of other species that do

not match the biology of the target species, e.g. minimum mesh sizes designed to only catch mature target species may still catch immature individuals of larger species in the area.

Some considerations for enacting gear restrictions are as follows:

- Assess the extent of the problem: how many people are using the gear? Where are they from? What are the barriers to change? What are potential conflicts that may arise from the gear ban, and how can these be managed?
- If the gear is currently widely used, should there be a plan to phase it out over time?
- If it is expensive to replace the gear, is there a plan to subsidize the purchase of new gear?
- Will the gear ban disproportionately affect poorer members of the community, who have less ability to change gears and/or less livelihood options?
- Will the gear ban disproportionately affect female members of the community?

Such considerations should be discussed during community consultations to help reach agreement on restrictions and their implications. It can also be useful to conduct one-on-one or small group interviews with gear users to gain a better understanding of the situation. This helps users give their opinion openly without fear of public shaming (e.g. feeling attacked in a village meeting, or being ashamed to say they cannot afford alternative gear).

13.6 Useful resources:

- Blue Ventures has created 12 handbooks on specific aspects of the LMMA approach that include both technical guidance and descriptive comics aimed at community members, in Malagasy, French and English.
 - Handbook Three, "Destructive Fishing Gears" provides a useful educational tool to help discussions regarding the issue of destructive fishing gears.
 - These handbooks are freely available: <http://mihari-network.org/how/>

13.7 Alternative livelihood initiatives

While many management tools aim to address the threat of unsustainable fishing practices, they often do not directly address the demand for the resource itself. Alternative livelihood projects are activities that ease people's dependence on the marine resource, by providing an alternative means of income or food source.

Alternative livelihood projects are very challenging to implement and their success, or otherwise, can be uncertain [9]. They are best used as a complementary approach to more direct forms of natural resource management, such as NTZs. In this way, they help to both reduce fishing pressure and supplement the income/food security of those people who will be negatively affected by the loss of fishing revenue and/or food.



Examples include:

- **Aquaculture:** whereby a resource is farmed primarily for trade (normally export), such as sea cucumber or seaweed farming.
- **Eco-tourism:** whereby tourism fees related to visiting the project area/communities are charged, with proceeds used to support project costs and communities.
- **Craft production:** whereby traditional arts and crafts are made by communities to sell to visitors and tourists, with proceeds used to support project costs and communities.
- **Setting up any eco-tourism project within an LMMA** requires the following, before any tourism-related claims can be made and fees can be charged.
- **Legal recognition** for the community's management rights will need to be acquired (see the following Chapter, [Stage 2: Chapter 4 'Consider Legal Options'](#)) and;
- **Consultation** with and permission from the regional Ministry of Culture and Tourism

Once legality has been granted, it is recommended that signposts are constructed at all major entrance points to the area to increase tourist recognition for the LMMA. These should be coupled with information boards that illustrate a map of the area, explain the LMMA approach and provide information on tourist information and entrance fees. These signs and boards serve a dual purpose as boundary markers and information boards for the communities. It can be beneficial to work with tourism operators (e.g. local hotels, diving operations) to facilitate this recognition and to encourage tourism in the area.

If possible, it is useful to have an information centre within the area, perhaps in the village with the easiest access for tourists. This center can act as an office for the management committee as well as a shop for selling arts and crafts, information point for more detailed information on the LMMA and the communities, a meeting point to hire an eco-guide for the area or to arrange a village-stay, as well as a point to pay entrance fees. It can also provide accommodation for management committee members who come from more remote areas for meetings. Information points/posters could otherwise be placed within local hotels and other headquarters of tourism operators, or in local cafes and bars etc.

Eco-guides will need to be trained to be confident with foreign tourists, learning the language as well as learning foreign names for animal and plant species to identify. Training will need to be provided by the Technical Partner in partnership with the regional Ministry of Culture and Tourism. Training usually involves potential guides accompanying staff on daily tasks and learning through observation. Eco-guides can offer activities such as day trips in traditional sailing boats with snorkeling and wildlife watching or trips to/stays in villages to observe traditional village life.

When considering alternative livelihood options, support of existing local associations such as women's groups can help increase training and education. This may lead to new income streams, for example training women's groups to prepare traditional meals for tourists, crafts and sell clothes, embroidery and jewellery. When supporting local associations it is important to pay close attention to the

organisational structure of livelihood activities, to listen to stakeholders and ensure incentives introduced through alternative options align with these structures. Otherwise conflict can quickly arise within groups, especially if some people are perceived as benefiting more than others.

Collaboration with private stakeholders can greatly assist alternative livelihood projects by supporting and promoting their trade. For example, collaboration with seafood exporters to connect community-led aquaculture with international markets, and collaboration with tourist agencies and hotels to advertise tourism to area and the NTZ and to sell community crafts in hotels and other outlets.

13.8 Useful resources:

- Blomley, T. & Richards, M. (2011) Community Engagement Guidance: Good Practice for Forest Carbon Projects. In: Building Forest Carbon Projects. Eds. Johannes Ebeling, J. & Olander, J. Washington DC: Forest Trends.
 - Although focussing on forest carbon projects, Chapter 6 provides useful insights into alternative livelihoods projects, and their viability.



CASE STUDY BOX

Aquaculture of seaweed and sea cucumbers by communities in Velondriake.

Since 2007, Blue Ventures (BV) has worked closely with local communities in Velondriake to master farming techniques, and produce market-worthy sea cucumbers and seaweed. Working with the University of Toliara's Marine Science Institute (IHSM), local seafood exporter Copefrito and aquaculture company Indian Ocean Trepang (IOT), isolated coastal communities are being connected with lucrative international markets for seaweed and sea cucumbers, enabling families to develop their own aquaculture businesses.

BV aquaculture specialists have trained over 700 people (as of 2015) to become farmers of sea cucumbers (*Holothuria scabra*) and red "cottonii" seaweed (*Kappaphycus alvarezii*). Sea cucumbers (known as trepang after processing) are in high demand in Asian markets where they are considered a delicacy, health food and aphrodisiac, while red seaweed is widely used in food and cosmetics industries as a texturing agent.

Why seaweed and sea cucumbers?

- Well suited to Madagascar's extensive shallow coastal lagoons
- High demand from lucrative international markets
- Farms operate with low running costs
- Production methods are simple, requiring minimal initial training, and producing negligible adverse environmental impacts

- An established network of business and research partners provided assured access to markets, sea cucumber hatchery technology and juvenile supply (which is vital for getting a hatchery underway), and technical expertise to maximise the benefits to communities

Farms are fully owned and operated by the communities themselves, with BV the technical partner providing materials and technical guidance and assisting with start-up costs in partnership with IOT, who helped provide juveniles. In partnership with CITE, a Malagasy NGO supporting local socio-economic and entrepreneurial development, BV are also helping to nurture small business development with training programmes that build the technical, financial, managerial and organisational skills needed by fishers to manage their own business. This support is fundamental to improving revenues and working towards the long-term sustainability of the business.

Over half of the farmers supported by this project are women, who often use this new income to help pay for children's school fees and supplement their family's diet.

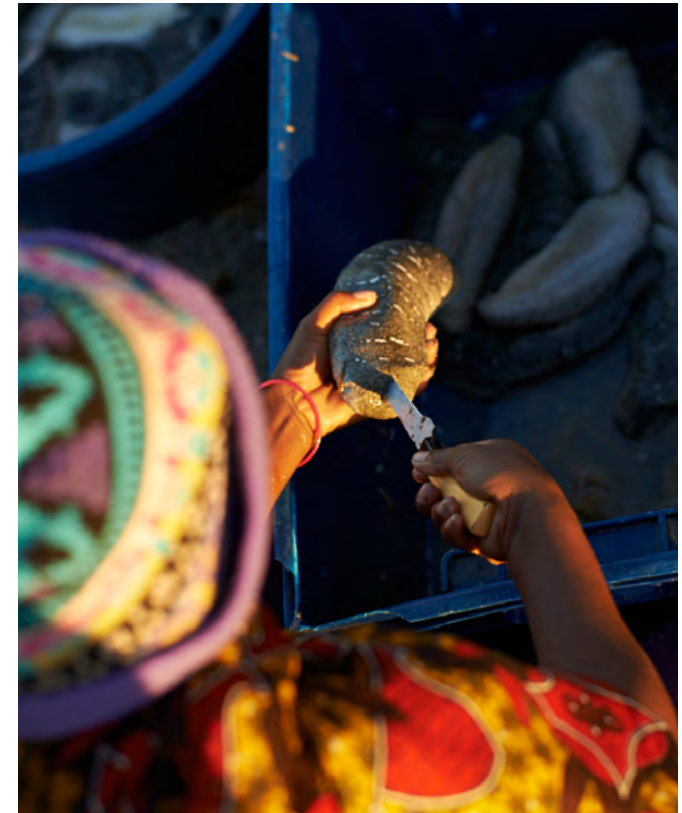
Like with any farming, coastal aquaculture is complex and introducing new innovations in aquaculture to fishing communities is challenging. Such projects require strong technical partnerships and practical experience. The commercial nature of the projects means that results and developments are generally not publicised and experiences of overcoming technical, logistical and financial challenges in production are rarely shared.

However, communities can overcome these challenges with partner support. Projects in Velondriake are already displaying encouraging results, with growing numbers of farmers every year and income being generated. Given the existence of these projects, IOT and Copefrito's own farms and other aquaculture projects set up by ReefDoctor, there exists an in-country network to learn from and share experiences with to help overcome the inherent challenges.



13.9 Useful resources:

- Blue Ventures has created 12 handbooks on specific aspects of the LMMA approach that include both technical guidance and descriptive comics aimed at community members, in both Malagasy, French and English.
 - Handbook Seven, "Sea Cucumber Farming" provides useful guidelines for sea cucumber farming, including site selection, farming methods and financial advice.
 - Handbook Ten "Eco-Tourism" introduces eco-tourism approaches and provides information on guidance and advice for successful eco-tourism initiatives.
 - These handbooks are freely available: <http://mihari-network.org/how/>
- ReCoMap (2011) Handbook for Sandfish Farming. Indian Ocean Commission.
 - Provides detailed guidance on sandfish/sea cucumber farming in Madagascar with technical guidance, useful factsheets and a cartoon depicting community-based sea cucumber farming.
 - Freely available online: <http://www.reefresilience.org/wp-content/uploads/Handbook-for-sand-fish-farming.pdf>
- Ateweberhan, Mebrahtu, Antoine Rougier, and Cicelin Rakotomahazo. "Influence of Environmental Factors and Farming Technique on Growth and Health of Farmed Kappaphycus Alvarezii (cottonii) in South-West Madagascar." Journal of Applied Phycology 27.2 (2015): 923–934.
- Rougier, Antoine, Mebrahtu Ateweberhan, and Alasdair Harris. "Strategies for Improving Survivorship of Hatchery-Reared Juvenile Holothuria Scabra in Community-Managed Sea Cucumber Farms." SPC Beche-de-Mer Information Bulletin 33.May (2013): 14–22.
- Blue Ventures aquaculture factsheet: <https://blueventures.org/publication/aquaculture-factsheet/>
- Blue Ventures aquaculture blogs, e.g.: <http://blog.blueventures.org/development-community-aquaculture-project-going-beyond-technical-aspect-real-sustainability/>
- Blue Ventures online information on aquaculture with useful videos sharing aquaculture lessons learned: <https://blueventures.org/conservation/aquaculture/>
- Ateweberhan, Mebrahtu et al. Community Based Aquaculture in the Western Indian Ocean: Challenges Faced and Lessons Learned (2013) Blue Ventures Workshop Report: <https://blueventures.org/publication/community-based-aquaculture-western-indian-ocean-challenges-faced-lessons-learned/>





13.10 Mangrove forest restoration management

Mangroves are exceptionally productive ecosystems, important both for the unique biodiversity that they support as well as the livelihood benefits they provide to millions of coastal people. Mangroves provide coastal protection from storms, they stabilise shores, filtrate water and provide building materials, firewood and charcoal. Madagascar has the fourth largest extent of mangrove forests in Africa, nearly 2,200km², which is equivalent to 308,000 football pitches. However, this coverage is on the decline due to unsustainable demand for the benefits outlined above.

Mangroves are ecologically linked to other coastal habitats, supporting important fisheries by acting as nurseries for juveniles and prime habitat for species such as shrimp and crabs. Thus, management of mangroves is complementary to other LMMA strategies targeting fisheries and coastal habitats. As such, threats to these systems include not just overexploitation, but also deforestation and degradation.

Mangrove management can adopt the use of temporary closures and permanent reserves, as described in detail above. In addition, mangrove restoration activities such as replanting are beneficial approaches to improving these habitats that can be conducted by local communities. Training needs to be provided in the establishment and management of tree nurseries, and best practice in planting. Mangrove restoration projects have the potential to provide multiple benefits by supporting valuable life-cycle stages of fisheries as well as other non-target species, in addition to

providing livelihood benefits through tree planting training, which could be extended to household/village woodlots for firewood and other forest resource benefits.

Mangroves also hold an additional value; they store very large amounts of carbon in their biomass and sediments, known as 'blue carbon'. This carbon has a value on international carbon markets, which has the potential to be realised and harnessed by local people whose livelihoods depend on the exploitation of mangroves.

Thus there may be potential to fund the restoration of mangroves through the generation of blue carbon credits, with additional benefits of supporting livelihoods and safeguarding fisheries in Madagascar's coastal areas ([see Stage 4: Chapter 3 'Financing options'](#)).





14. Consider Legal Options

14.1 Importance of legal frameworks for resource management

While the central philosophy of an LMMA hinges on locally designed and enforced rules, legal frameworks to recognise these rules and secure the rights of local communities to use and to manage their resources are vital for the long-term success of the LMMA.

In Madagascar three main governance options are available to LMMA managers. In considering these frameworks there is a clear trade off between the level of accessibility for communities, and the level of security the mechanism gives to local users.

Reviews of the legal frameworks available to LMMA managers are currently underway, led by government ministries in collaboration with members of the MIHARI network, and with a view to creating options that are more effective and more accessible towards achieving the government's promise to triple the coverage of marine protection.

14.2 Natural resource governance in Madagascar

The Government of Madagascar is responsible for management of all of Madagascar's natural resources. In particular, two government ministries recognise LMMAs as a resource management tool that both meets the needs of communities and allows the departments to achieve Their goals:

- The Ministry of Fisheries Resources and Fishing (MRHP; Ministère des Ressources Halieutiques et de la Pêche) including regional administrations (DRRHP)
- The Ministry of Environment, Ecology, Sea and Forests (MEEMF; Ministère de l'Environnement, de l'Ecologie, de la Mer et des Forêts) including regional administrations (DREEMF)

A third ministry, the Ministry in charge of Presidential Projects and Land-Use Planning (MEPATE) has oversight for planning processes for land and sea. The maritime plans will include LMMAs as a component.

MEEMF is currently leading on fulfilling Madagascar's aim of tripling marine protected area coverage by 2020 through its recently created Oceans Directorate (Direction Generale de la Mer).

Through these ministries, the Government of Madagascar delegates management authority and rights to the local level through two principle mechanisms:

- Marine Protected Area (MPA) creation following IUCN protected area categories 5 & 6
- Natural Resource Management Transfer, (TGRN; Transfert de Gestion des Ressources Naturelles)
- Since the late 1990s, a third legal mechanism (originally used for public security) has been used extensively in natural resource conservation
- Dina

These three mechanisms are described below, in order of increasing complexity.

14.3 Dina

What are the characteristics of Dina?

Dina are customary laws that have been used in Madagascar for centuries for public security. Dina are used to regulate crime, enforce contracts, and, more recently, to manage natural resources. Design and implementation of the Dina rests at the village level, though in the 1990s Dina were given recognition in Malagasy law and have legal weight provided they have been validated by regional courts.

Dina are best suited to address local problems, such as the enforcement of an octopus closure or banning of poison fishing. Dina are not appropriate for addressing larger issues like mining, industrial fishing or tourism development, as they are only binding to the community members that have agreed to it. Also, Dina cannot contradict national law they may only supplement it. In contrast to MPAs and TGRN, a Dina does not confer actual management authority from the state to a local community; it only allows for communities to ban/penalise certain activities.

How is Dina managed?

Put simply, the management of the LMMA is governed by a local convention or "Dina". The Dina puts in place management rules for the LMMA, including the practices and gear prohibited and the establishment of temporary or permanent reserve areas. They are broadly used in



Madagascar for LMMAs that rely on temporary closure of fisheries as the main management measure.

The content of a Dina is composed of the following:

- Objective of the Dina
- Resource or management tools regulated by the Dina
- Population or community affected/Scope of application
- Enforcement procedure
- Rules and fine for each regulation
- General rules

How is Dina governed?

The management decisions of the LMMA are taken within a broad management committee composed of community members, through consultation meetings within the villages. Dina can be created by one village, or collectively by multiple villages if all are in agreement.

A Dina is a legal text that is set up to manage the relationships between the communities involved in designing and implementing it. Given this, it can be difficult to enforce on migrant resource users within the LMMA. This is why in some cases Dina are created within multiple communities, to expand the coverage and hence effectiveness of the LMMA management.

Dina are recognised as an efficient tool to foster community interest in resource management, and increase compliance with the management measures. For this reason, they

can also be adopted within the two other legal options presented here (MPA and TGRN), to supplement their management.

How is Dina established?

Detailed steps for creating a Dina are presented below. However, it is not always necessary to conduct every step in the process, as if the community themselves perceive the need for management they can implement a Dina without external consultation. As such, LMMAs managed by Dina are the most basic of the legal frameworks, as apart from the process of regional court validation, they do not necessarily require the same number of formal steps to be established as for TGRN and MPAs.

Resource assessment and monitoring is not a required step in the Dina process. However, technical partners, such as NGOs, often require such assessments if they are supporting the community/communities through Dina creation.

Establishment of a Dina specific for an LMMA can be broken down into two key phases:

Creation phase

- Identification of all affected stakeholders
- Review all regulations such as national law that are similar to the potential Dina
- Awareness raising within all affected communities and feasibility study
- Conduct a mapping assessment, with a simplified layout of the LMMA including the different zonings

- The rules and regulations on the area need to be decided upon in a village meeting, encouraging participation by as many people as possible to ensure a high level of community ownership and support. If the regulations are not widely agreed upon as fair, they will be very difficult to enforce
- Creation of a management committee ([Step 3, chapter 1](#))
- Creation of a local committee of patrol and enforcement ([Step 3, chapter 3](#))
- Establish a system of ecological and socio-economic monitoring ([Step 3, chapter 4](#))
- Once the community is satisfied with the rules and regulations for the reserve, a Dina should be discussed openly and agreed upon. Fines should be an amount that is realistic for fishers to pay, but large enough to effectively discourage theft (e.g. 50,000-60,000 Ariary – as of 2015). It is also important to determine procedures for enforcement of the Dina at the time of its creation to avoid future delays and/or confusion if a violator is caught.
- Include a provision that sets the procedure for any potential amendment to its content in the future
- Formalise the Dina in regional courts; to ensure their legality as well as to provide strong institutional backing if a Dina infraction needs to be taken to court

Communication phase

- Communicate and publish the Dina as widely as possible once it has been agreed by all communities involved



Dina strengths	Dina Weaknesses
<ul style="list-style-type: none"> ■ Improved involvement of communities in management of resources ■ Least expensive and least complicated of the three LMMA legal mechanisms to establish ■ Least expensive and least complicated of the three LMMA legal mechanisms to implement 	<ul style="list-style-type: none"> ■ Enforcing the Dina is difficult in the case of migrants ■ Boundary of the area governed by Dina (the LMMA) is not officially defined or registered by the state, does not secure local user rights. ■ Dina cannot influence other sectors (industrial fishing, petroleum, mining) potentially harmful to the resources ■ Internal issues within the community, such as family links or pride/shame, can sometimes prevent the enforcement of a sanction/penalty

Table 14.1 Dina strengths and weaknesses

- Publishing involves announcing the Dina on the Radio as well as distributing a hard copy of the Dina to all villages, especially to the presidents of the village and all involved in the LMMA management. However, it is important to ensure the Dina is posted in a position visible to all community members and not just transmitted to the local authorities
- Ensure the Dina is as simple as possible and easy to read and understand
- Always continue awareness-raising, even once the Dina is being implemented
- It is important to always raise awareness regarding the reason behind the Dina, to highlight the positives and benefits of the approach, such as resource sustainability, and not just the negatives such as the prohibited activities

14.4 Natural Resource Management Transfer (TGRN; Transfert de Gestion des Ressources Naturelles)

What are the characteristics of TGRN?

In 1996 MEEMF passed the Natural Resource Management Transfer (GELOSE; Gestion Locale Sécurisé) law (Law No. 96-025) to achieve "the effective participation of rural populations in the sustainable conservation of renewable natural resources". Through the TGRN mechanism, official management authority of the LMMA is delegated from the state to a Community-Based Association (COBA), which is a non-governmental group of volunteer individuals within a local community.

How is TGRN managed?

The terms of resource management transfer are determined by:

- A contract
- A specification book
- A Dina
- A management plan

TGRN contracts are contingent on creation of a simple management and zoning plan, accompanied by specifications that detail the management obligations of the COBA. Management delegation can be rescinded if the plan is not effectively implemented by the COBA, similar to that of protected areas.

Within the TGRN framework, the community also create a Dina to facilitate the resource management.

Who governs TGRN?

Communities are granted the right to control the access, use and exploitation of the resource according to rules established by the COBA, providing these are in accordance with national regulation. The COBA are allowed to collect taxes on sustainable resource use to finance their functioning.

GELOSE contracts are established between the COBA, the host municipality or "commune", and the MEEMF and the MRHP (or if they feel legally competent, the DREEMF and DRRHP) for an initial duration of three years, renewable to ten years thereafter.



Contract renewal is subject to an evaluation by the regional ministry administrations to ensure that communities have respected the management plan defined in their contract. Management rules and schemes can be updated at each contract renewal to keep pace with evolving environmental and socio-economic conditions.

However: While fisheries could certainly be considered a renewable natural resource, debate around the current interpretation of the 96-025 law have established that that it cannot be applied to the marine environment. As such, TGRN has been used extensively in Madagascar for terrestrial and mangrove forest management yet is not common in the management of marine resources.

To address this issue, the MRHP has established management transfer of fisheries under a new fishery code that would be an equivalent of TGRN specific to fisheries. This new code is currently under adoption (as of 2015) and hence the details are not yet known.

How is TGRN established?

The establishment of GELOSE contracts involves the following steps:

- Participatory community consultation and situation analysis. This ensures all stakeholders are integrated into discussions and represented in the management committees. An independent environmental mediator needs to be involved to convene a common vision between different viewpoints
- Creation of the COBA

- Once the COBA is established, a formal demand of TGRN creation is submitted to the host commune (administrative district). After validation, the commune informs the DREEMF (and occasionally also the DRRHP) or the central Ministries of the creation process
- Each management plan is translated into a formal simplified management plan "Plan d'Aménagement et de Gestion Simplifié (PAGS)"
- Local consultation workshops are carried out to validate each PAGS and to safeguard against conflicts between or within communities
- After validation, PAGS are submitted to DRRHP and DREEMF
- DRRHP and DREEMF compile the management contracts following the review of the PAGS and validation. These are then signed with the host communes and the management committees.
- The newly signed contracts are officially announced at a ceremony and launch event.
- Management committees receive training in the TGRN legal framework and administrative functioning. Technical partners (NGOs) often provide this training, due to limited state resources.

TGRN Strengths	TGRN Weaknesses
<ul style="list-style-type: none"> ■ Improves collaboration between communities and regional authorities, as well as within the commune. ■ Improves recognition of the powers/rights of communities through the tripartite agreement. 	<ul style="list-style-type: none"> ■ The Dina can be difficult to enforce ■ Community members not part of the COBA can feel marginalised. ■ The transfer does not imply acquisition of land tenure which can be confusing to communities ■ Monitoring and enforcement support from the ministries is lacking, placing a burden on communities. ■ Current interpretation of the TGRN law has set that it cannot be applied to marine resources

Table 14.2 Transfert de Gestion des Ressources Naturelles (TGRN) strengths and weaknesses



14.5 Marine Protected Area (MPA) creation

What are the characteristics of an MPA?

LMMA can be implemented through the existing system of Protected Areas (PAs) in Madagascar. Recently, the Protected Areas Code (COAP) has been updated to correspond with the IUCN categorisation for Protected Areas. Some LMMA sites supported by conservation NGOs such as Blue Ventures, WCS, WWF and CI are now Category V and VI MPAs, where the primary objective is sustainable resource use.

Official PA status within Madagascar's System of Protected Areas (SAPM) secures the rights of local users to the resources, and affords these areas the highest level of protection, ensuring that there will be no new permits granted for extractive industry, such as mining and industrial fishing. It also means that the development of projects within these areas, such as tourism or aquaculture, will be held to very strict standards of environmental sustainability.

How is the MPA managed?

Technical and financial partners often jointly manage these LMMAs, most often a national or international NGO. In theory, this could also be a private sector operator though this has yet to be realised in practice in Madagascar. MPAs consist of a number of different zones, as stipulated by the COAP:

- The core no-take areas (noyau dur). All resource use activity is banned within the core no-take zones. In the case of Cat V and VI Marine Protected Areas, these zones tend to be quite small areas (<100 ha).

- And the Buffer Zones (zone tampon), which surround the noyau dur, and are generally subject to restricted activities. The term "Buffer Zone" can be misleading, as it implies that these zones are outside of the MPA, when in fact they are within it. A more appropriate term would be "Sustainable Use Zones", as they are generally subject to gear restrictions and/or temporary closure areas. Small-mesh nets are an example of a gear likely to be banned in the Buffer Zones of a Cat V or VI MPA.

These various management measures are detailed within the MPAs Management and Zoning Plan (PAG; Plan d'Aménagement et Gestion), developed through extensive consultations involving all concerned stakeholders, including fishing communities, and ministries. The rigorous consultation process is designed to ensure strong local and governmental support, and affords the most robust and secure protection of the area. It can take time before a PAG is agreed and established, and so often a Dina is created to enhance protection before the consultation process is complete and protected status awarded. The 2015 COAP has established a new document called 'community convention' which aims to further detail the rights and involvement of the community in the PA, currently under development.

Who governs the MPA?

When Definitive Protected status is obtained, MEEMF and MRHP delegate management authority for a protected area to an official manager, such as the NGO or management association supporting the MPA, through a delegation contract.

A committee of co-management is established, composed of a community association (similar to the Management

Committee as described in this Resource Kit) and a technical partner, often an NGO. This co-management committee makes the management decisions of the MPA.

Alongside the co-management committee, a steering committee composed of the competent authorities (ministries) is also often established. The steering committee provides guidance as well as validates the documents adopted within the MPA, such as the PAG.

If MPA rules and regulations are not effectively enforced, management rights can be revoked and the delegation contract rescinded. For example, if efforts to ban the use of small-mesh nets within the protected area failed, the delegation contract could be rescinded.

How is the MPA established?

The process can be broken down into two key phases:

Phase 1: Obtaining temporary protected status

This first phase involves initial stakeholder consultations, baseline socio-economic and ecological assessments, and the creation of a draft management and zoning plan for the future MPA. The purpose of this first phase is to make the case for the importance of protecting the area, as well as demonstrating support for the protected area from all local community, regional and local government, and private sector stakeholders.

The first phase results in the obtainment of an inter-ministerial order, granting the proposed area two years of protection. Critically, this two-year protection precludes the issuing of new exploitation permits for industrial fishing and mining projects.



The steps towards obtaining temporary protected status include:

- Submission of a letter of intent to MEEMF that includes succinct information about the site and the case for protection, as well as demonstrating that there is no overlap with existing economic projects, such as industrial fishing, mining blocks or aquaculture.
- Initiation of the Integrated Coastal Zone Management (ICZM) process, involving preliminary consultations with all coastal zone stakeholders to ensure support and involvement in the MPA creation process.
- Baseline ecological and socioeconomic assessments are conducted, further establishing the importance of protection as well as the status of local communities and considerations for safeguarding their wellbeing. Results of these studies are summarized in a Simplified Environmental Impact Study (EIES; Etude d'Impact Environnementale Simplifiée).
- Initial consultations with all MPA stakeholders. These consultations serve to further demonstrate support for MPA establishment, as well as establish proposed boundaries and a preliminary zoning plan.
- Submission of a formal request for temporary protection.

Phase 2: Obtaining definitive protected status

Upon receiving temporary protected status, the steps towards definitive MPA creation include:

- Establishment of the Orientation and Evaluation Council (COE; Conseil d'Orientation et Evaluation), which includes representatives of regional stakeholders and provides

general guidance to the MPA creation process, as well as ensuring that the MPA promoter/technical partner (usually an NGO) adheres to conditions established in the temporary protection order

- Creation of a contract for the temporary delegation of management rights from the MEEMF and MRHP to the MPA promoter/technical partner
- Further stakeholder consultation to finalise the MPA zoning and management plan. Results of these consultations form the basis of the MPA's Management and Zoning Plan (PAG; Plan d'Aménagement et Gestion). The PAG is then validated through regional and national workshops.
- Elaboration of the EIES and an accompanying Social and Environmental Safeguards Plan (PSSE; Plan de Sauvegarde Social et Environnemental).
- Validation of the EIES and PSSE documents through a site visit by the National Environment Office (ONE).
- Delimitation procedures by the Regional Topography Service. This results in the creation of a plan de repérage, establishing the limits of the protected area, identifying any land claims within the limits, and requesting a freeze on granting of new exploitation permits and land titles within the MPA limits.
- Formalisation of the management rights delegation contract between the two ministries and the MPA promoter, making the terms definitive.
- Formal MPA creation via official decree from the Government Council via the Marine Protected Areas Department within the MEEMF.

MPA strengths	MPA Weaknesses
<ul style="list-style-type: none"> ■ Stronger legal protection through the decree ■ User rights recognised in national and regional zoning plans ■ Control of the activities of other sectors (such as mining, oil) through the decree and the management plan 	<ul style="list-style-type: none"> ■ Gaining official protected status is long and costly, especially for the communities who depend entirely on the support of a partner NGO ■ Difficulty in enforcement of Dina toward migrants and even within the community, due to family ties ■ Once obtained, on-going MPA management costs are high, increasing dependency on the partner NGO for financial sustainability

Table 14.3 MPA strengths and weaknesses



14.6 Overview of legal steps

In summary, each legal framework is different and has a number of distinct steps to be established. There are, however, a few similarities between the steps required for each framework (Table 14.4).

Table 14.4 Steps to establish each legal framework. Colour coding represents similarity between steps.

DINA	TGRN	MPA
<ul style="list-style-type: none"> ■ Evaluation of community desire for resource management ■ Analysis, consultations and familiarisation with the stakeholders ■ Analysis of resource situation and local management needs ■ Crosschecking scientific and local knowledge on the resources ■ Prioritization of needs and management measures ■ Establishment and approval of the Dina ■ Establishment of a management structure including a community association ■ Zoning and establishment of the reserve ■ Establishment of a system of ecological monitoring 	<ul style="list-style-type: none"> ■ Surveys of communities and identification of potential areas ■ Request opinion of DRRHP and DREEMF ■ Constitution and formalization of the COBA. Including a president, vice-president, treasurer and a secretary ■ Socio-economic study on the use of resources by the Communities ■ Elaboration of management tools including the management plan, the Dina, the specifications and the management contract ■ Participatory Delimitation of resources for transfer with Stakeholders ■ Signed contract between the communities, the municipalities and DRRHP and DREEMF ■ Strengthening capacity on the implementation of management tools 	<ul style="list-style-type: none"> ■ Preliminary consultations to ensure the support and involvement of the stakeholders ■ Ecological and socio-economic assessments ■ Presentation of a formal request for temporary protection ■ Obtaining a decree of temporary protection ■ Establishment of the Committee of guidance and assessment (COE) ■ Creation of a code for the temporary delegation of management rights ■ Development and validation of a development and management plan (and possibly a Dina) ■ Stakeholder consultations for the zoning of the AMP ■ Preparation of an environmental and social impact study (SEIT) and establishment of a plan social and environmental safeguards (UTA) to obtain an environmental permit ■ Creation of land use map, establishing the different limits and the use of land in the area ■ Agreement of management responsibilities between the Ministries and the promoter of the MPA ■ Submission of an official request for ultimate protection in order to obtain the final protection ■ Obtaining an official decree from the government formally creating the MPA



Which legal framework to adopt?

In short, this depends on the context and current situation, financial, technical and human resources you have, as well as time available and the capacity of communities to manage the LMMA. Dina is the most simple of the processes, followed by TGRN and then MPAs. If such resource factors were not a limitation, an MPA would be the most desired framework given the extensive protection it provides.

The MPA creation process is complicated and expensive, requiring significant investment in terms of financial and human resources and time. Extensive consultations, scientific studies, social and environmental impact assessments are required, as well as regular evaluations by the National Environment Office (ONE). Thus, PA creation is inaccessible to most coastal communities in Madagascar given their current capacities and thus financial and technical support from a partner organisation, such as an NGO, is often necessary.

Since it promotes a highly decentralized resource management model, TGRN ensures a strongly participatory decision-making process and allows for a community's socio-economic, cultural, and governance particularities to be taken into account. TGRN also allows for a great degree of flexibility, since management rules can be modified at each contract renewal. However, since management transfers are established for each community, this process requires a high level of initial investment to develop the contracts and build community capacity, as well as in the provision of the requisite technical support for the first three to five years. In addition, management contract renewal

requires an evaluation by DREEMF and DRRHP. Thus, the financial commitment needed to support this management structure in the long term is likely to be similar to, or higher than that required for a formal MPA.

The establishment of an MPA offers a more long-term solution than the TGRN framework, since the permanent protected status, once achieved, carries no time limit, although ONE must carry out regular audits. Since it allows for management at greater geographical scale, the financial commitment needed to ensure the functioning of the MPA after creation is likely to be lower than with multiple TGRNs.

Whereas TGRN grants management rights directly to community associations, MPA management requires a higher level of technical capacity, and it is thus likely that an NGO would be the official manager of the Protected Area. It is, however, possible to delegate certain management responsibilities from the NGO to community management associations, allowing for a step-wise progression towards true community-based management as capacity is built.

The experience of LMMAs in Madagascar has shown that communities and partnering NGOs have often begun LMMA creation with Dina for the area, evolving towards either a TGRN or an MPA over time to ensure greater resource protection.

The government of Madagascar has made strong commitments to improving the legal framework for LMMAs. LMMA managers and NGOs are currently advocating through the MIHARI network for a more accessible mechanism to secure management and user rights to marine resources, and hope this will change rapidly.

14.7 Useful resources:

- Blue Ventures has created 12 handbooks on specific aspects of the LMMA approach that include both technical guidance and descriptive comics aimed at community members, in both Malagasy, French and English.
 - Handbook Four, "Local Conventions For Coastal Resource Management" describes the history of Dina in Madagascar and helps communicate the similarities and differences between the traditional and the conservation Dina.
 - These handbooks are freely available: <http://mihari-network.org/how>
- Bérard, M-H. (2013). Légimité des normes environnementales dans la gestion locale de la forêt à Madagascar. Canadian journal of law and society 26(01): 89-111.
 - Covers legal aspects in Madagascar in general, including DINA and TGRN.
- Randrianarison, M., et al. (2009). La réalisation du développement durable à Madagascar: Le contrat de transfert de gestion n'est pas une fin en soi. McGill International Journal of Sustainable Development Law and Policy 5(2): 171-197.
 - Discusses TGRN in particular.
- Gardner, C. J. (2011). IUCN management categories fail to represent new, multiple-use protected areas in Madagascar. Oryx 45(03): 336-346.
 - Discusses the complexity of MPAs.



15. Exchange Information

At this point in the creation of an LMMA it is likely the communities concerned will have been working in relative isolation. Given the geography and lack of infrastructure, channels of communication between communities are likely to have been limited, providing little opportunity for sharing of experiences. However, the LMMA approach is growing in popularity across Madagascar and the wider Indian Ocean region, and a wealth of experience and knowledge exists within those communities already implementing the LMMAs. Building networks between these communities and sharing lessons learned provides multiple benefits, from building confidence in the approach to exchanging information on what has and hasn't worked, allowing LMMAs as an approach can be improved on a wider scale. For this reason the creation of links between communities and sharing of information is encouraged, and this can be achieved through existing LMMA networks, such as MIHARI, and by initiating peer-to-peer exchanges.

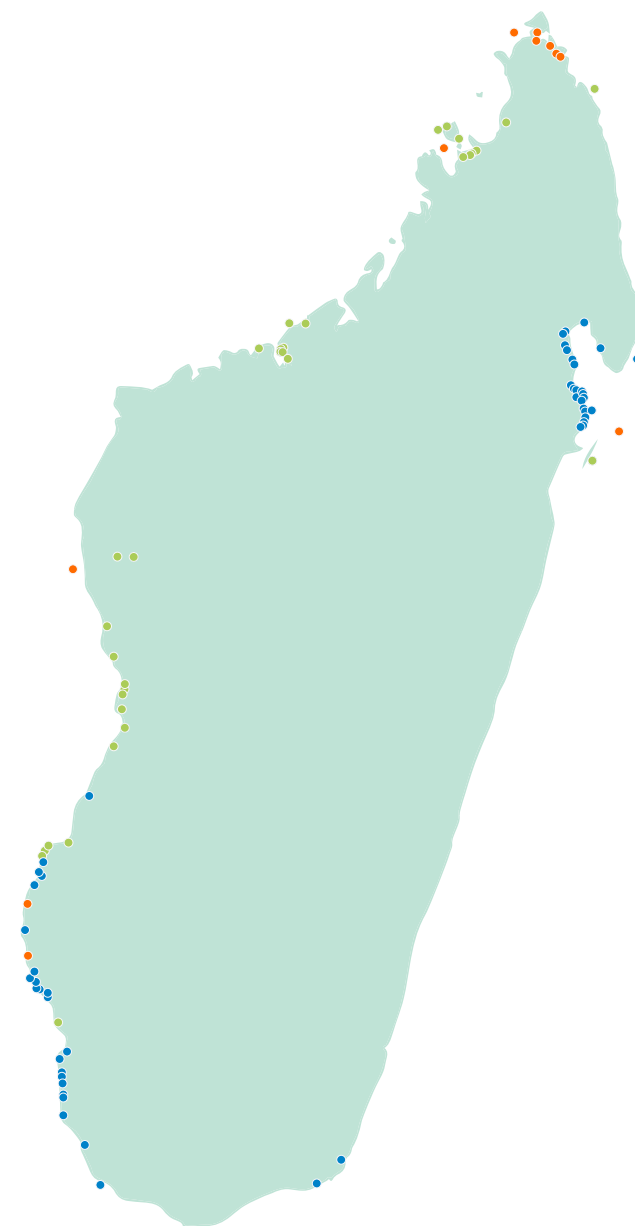
15.1 The MIHARI network

Since 2012 Madagascar's LMMAs have been united within an informal network known as MIHARI, an acronym of 'Mitantana ny Harena an-dRanomasina avy any Ifotony', which translates as 'marine resources management at the local level'. MIHARI was established to provide a framework for community exchange and dialogue, to share local experiences of community based natural resource management. MIHARI also provides a platform to unite government, community and technical partner stakeholder groups and promote cross-group engagement and learning.

The network now includes over 100 LMMA initiatives and management associations (as of 2015) distributed over 12 degrees of latitude, from both the Indian Ocean and Mozambique Channel coasts of Madagascar (Figure 15.1). This totals over 7,250km² of marine and coastal habitat under local management, equivalent to 11% of Madagascar's coastal shelf, an area nearly a third larger than the marine coverage of Madagascar's national parks system. LMMAs within the network encompass a variety of marine and coastal environments from offshore coral archipelagos to coastal mangrove forests, with experiences being drawn from a broad range of target fisheries, socioeconomic settings, ethnicities, management structures and enforcement regimes.

- Co-Managed Protected Area
- DINA
- Management Transfer (TGRN)

Figure 15.1 Map of LMMA sites in Madagascar





The MIHARI network promotes partnership between over a dozen LMMA technical partners operating in Madagascar, including international NGOs such as Conservation International (CI), World Wide Fund for Nature (WWF), The Wildlife Conservation Society (WCS) and Blue Ventures (BV), as well as national institutions such as the Service d'Appui à la Gestion de l'Environnement (SAGE) and the Development and Environmental Law Center (DELC).

MIHARI also engages government stakeholders, notably MEEMF and MRHP and the Madagascar Systems of Protected Areas as well as the relevant regional and local authorities. By engaging different stakeholder groups, the aim is to strengthen the overall technical capacity to implement, monitor and enforce community based natural resource management.

Community leaders meet periodically in national and regional LMMA forums convened and supported by the NGO partners. This provides an invaluable opportunity for participants to share experiences, explore common issues and develop collaborative solutions face-to-face.

In addition, the network aims to communicate regular updates to members via email and radio newsletters. Following a series of regional and international LMMA workshops, MIHARI has facilitated community exchanges and partner NGO visits, and hosted people from Mozambique and Mexico with further visits from Kenya, Tanzania, Mauritius and the Comoros planned.

The Network is currently growing in capacity (as of 2015), and in the coming years it aims to develop new shared training and educational tools and resources, to establish coordinated monitoring systems to measure LMMA effectiveness, explore options for financial sustainability of LMMAs and to develop a central repository and organisation system for LMMA data.

15.2 Useful resources:

- MIHARI factsheets are freely available online in both English and French:
 - MIHARI – Madagascar's locally managed marine area network. 2015: <http://blueventures.org/wp-content/uploads/2015/05/Mihari-Leaflet-2015-ENGLISH-online.pdf>
 - MIHARI – Gestion Locale des Ressources Marines – Réseau Madagascar. 2015: <https://blueventures.org/publication/mihari-gestion-locale-des-ressources-marines-reseau-madagascar/>.
- The online platform www.mihari-network.org hosts information, news and material on Madagascar's LMMAs and the MIHARI network.
- For more information on MIHARI contact Vatosoa Rakotondrazafy, the MIHARI Network Coordinator at vatosoa@mihari-network.org
- A similar LMMA network exists for Asia and the Pacific region, and their website <http://www.lmmanetwork.org/> provides numerous resources for LMMA practitioners and communities.





15.3 Peer-to-peer exchanges

Peer-to-peer exchanges between isolated fishing communities are one of the most effective ways to spark and spread new ideas. A peer-to-peer exchange is when fishers from target communities (i.e. communities in the process of establishing an LMMA) visit communities already implementing LMMAs.

Through such exchanges, the visiting communities learn about the LMMA approach directly from real experiences of fishers from similar backgrounds to themselves, and see the community effects of LMMAs first hand.

The aim is for the target communities to realise that this is an approach that they can adapt to their own contexts. In this way, exchanges are useful tools to help build trust in target communities, and to relieve any concerns.

They are also a very powerful tool in building or reinforcing a sense of leadership and motivation for the individuals taking part in the exchange. However, exchanges are not an obligatory part of the LMMA process, if the target community has ample motivation in the set up of their LMMA than an exchange is not necessarily needed. However, if motivation is wavering at this stage of LMMA creation, or a few community members are not completely happy with the approach then exchanges are a great tool for overcoming these initial doubts and concerns.

Experienced communities that host the visitors often recount not only the benefits of LMMAs, but also the challenges that have been faced in implementing community management and so allow the new communities to prepare for, or even avoid, these challenges.

The experience communities also benefit from the exchange themselves, as it keeps up their motivation and builds pride in the progress they are making in the face of big challenges.

Peer-to-peer exchanges have been proven to help overcome initial hesitancy to the LMMA approach, especially concern regarding the suggestion of fishing ground closure. By adopting a 'soft approach' through these visits, communities see for themselves LMMAs in action with little to no pressure to continue if they are not satisfied with what they witness. However, hesitancy is frequently overcome, not just because communities observe working LMMAs but also because they witness the trust between experienced communities and their technical partner (NGO). Communities see that the fishery does in fact re-open, and they do not lose land tenure/access.

There is no fixed method to arrange a peer-to-peer exchange, rather a connection between the target communities and the experienced communities needs to be made. The MIHARI network can help with identifying suitable communities to link with, and can assist with the initial connection. A few key points to keep in mind when planning a peer-to-peer exchange are as follows:

Link communities working in similar settings, i.e. similar target species (e.g. octopus or sea-cucumbers), target locations (e.g. coral reef or mangrove) and using similar fishing practices (e.g. hand lines). Distances between the participant communities can be large or small, with exchanges between communities that are a short distance down the coast from each other (see Case Study Box A) to international exchanges such as that conducted between Mozambique and Madagascar (see Case Study Box B).

Funding is required to support the exchange, most notably to cover logistical and hosting costs, such as transport, food and accommodation. These costs will vary depending on the distance between the communities, and the need for accommodation, but they can cost up to £2000. It may also be necessary to provide compensation to fishers from the experienced community for time spent not working by assisting with the exchange. This should be agreed in advance, and be a reasonable amount depending on the local economy but not too large to encourage a culture of compensation. Exchanges are mutually beneficial, and this should be emphasised.

When selecting participants from the target community to send on the exchange, ensure they are considered 'legitimate' by their home community (i.e. fishers themselves), and respected so that their take-home messages will be listened to.

Participants should be shrewd enough to grasp the messages from the exchange. It is also helpful to select people that are known for being sceptical and asking difficult questions, as these type of people will often be the hardest to convince and the first to oppose the LMMA, thus if the exchange helps these people to overcome doubts they will in turn encourage other members of their community who are less hesitant. Selecting the right participants can be difficult, and takes local knowledge.



Do not necessarily select those villagers themselves or the village president suggest, as that might be due to local politics. Instead, spend time with the villagers through meetings and consultations (as described during the 'Initial Assessment' stage), and it will become clear if an exchange is indeed necessary, and which participants are best suited for the exchange. Participants from the experienced community should include members of the management committee, and be representative of different groups with the communities, including both men and women and less wealthy or marginalised people.

It is not necessary to have a strict agenda for the exchange. Rather, flexibility allows for target communities to observe the experienced communities and the LMMA site. Allowing participants to speak to each other without the pressure of a structure can help to avoid overload of information and helps key points to be focussed on. Both target and experienced communities should be prepared for what to expect. It might be the case that experienced communities, if they have not received exchange visits before, might need particular training to help facilitate the information exchange (see Case Study Box A).

Encourage the sharing of good practices, not bad. For example, try to avoid the spread of destructive fishing practices (e.g. fish traps) through exchange trips.

Follow up after an exchange is crucial to ensure that the participants have understood key messages from the host community, synthesised what they have learned and are comfortable leading discussions in their home communities.

CASE STUDY BOX A

Village exchanges in South West Madagascar [7]

Blue Ventures (BV) and Wildlife Conservation Society (WCS) worked to help create 50 new No Take Zones (NTZs) based on the Velondriake model under the 'Projet d'Appui aux Communautés des Pêcheurs de Toliara' (PACP). The PACP's objective was the sustainable development of the traditional marine fisheries in South West Madagascar. The project covered 310km of coastline between Morombe and Soalary, and was financed by the African Bank of Development.

PACP aimed to help villages establish their own NTZs as a fishery management tool, based on what the Velondriake community had achieved. BV and WCS's first step towards this was to arrange a number of visits for new target villages to Velondriake. The participants comprised a cross section from each village: fishermen and women, young and old, and village leaders. In total, 122 people from 14 villages undertook a 'voyage of initiation' to Velondriake, each for three days.

With facilitation from BV and WCS, members of the Velondriake Association (VA) held training workshops for the visitors. First, the Velondriake members related the history and experiences of their LMMA, then they facilitated the visitors' appraisal of their own natural resources and what problems they faced. From this the Velondriake members described the practical steps they had taken to overcome the same problems: how they had established NTZs and the success of these; how they had created the management structure of Velondriake and how this functioned; how

Velondriake had created Dina to manage their natural resources and how they were enforcing the Dina.

The Velondriake members took the visitors on practical exercises: They visited actual NTZs to see what quality of site needed to be chosen. They went from door-to-door in different Velondriake villages to question and learn from the experiences of other fishermen and women. What the visitors learnt in Velondriake inspired them to establish their own NTZs on return to their villages and several have since been implemented.

Prior to the village exchanges BV and WCS spent three days training and preparing the VA members to competently facilitate the workshops and train the visitors in how to establish a NTZ. This training included the fishing benefits of NTZs, the choice of site, the participative process needed to set them up, how to establish and legalise a Dina, and how to work with local government authorities. This training and their leading of the workshops gave them a deeper understanding of community-based natural resource management and confidence as leaders of Velondriake. The meetings also gave the VA an opportunity to learn from the visitors, some of whom had different ideas and approaches to CBNRM that had worked well. The visits gave a real sense of pride to Velondriake for what they had achieved.



CASE STUDY BOX B

An international community exchange across the Mozambique Channel

The first fisher exchange between Madagascar and Mozambique took place in February 2015, with guests from Mozambique hosted by the Velondriake LMMA Association (VA) in Madagascar. Situated just across the channel, Mozambique has similar fisheries and settings to Madagascar. Guests included representatives from two different coastal fishing villages in Northern Mozambique (Quirindi and Quiwia), including an oyster collector, an octopus trader, an octopus fisher and a village president. Also taking part were representatives from the organisations supporting these communities to develop fisheries management in Mozambique (ZSL, Bioclimate and AMA). The exchange was organised by ZSL with support from Bioclimate, AMA, the Velondriake LMMA and Blue Ventures, and funding from GPAF (project: GPAF-INN-029).

The first few days of the exchange took in tours of the village of Andavadoaka, octopus-gleaning sites and visits to the aquaculture site to meet fishers turned seaweed farmers. Discussions were held with octopus sellers and data collectors, and the group discussed VA's story and efforts to increase women's participation in management decision-making. The VA organised presentations, excursions and meetings, however it was often the one-on-one discussions that were found to be the most enlightening and useful to the participants.

Members of the VA highlighted many aspects of their experiences, including increased awareness for the conservation potential of temporary octopus closures as well as the benefits of forming a cohesive committee of representatives from 24 villages, and linking a network of reef and mangrove permanent reserves. The passion and enthusiasm of the VA proved infectious, with Mozambican guests engaging and asking multiple pertinent questions. Both male and female Mozambican guests were equally involved, unusual in their male-dominant home villages, having been encouraged by the vocal women of the VA.

During the exchange both visitors and hosts were constantly learning from each other, for example Mozambican guests informed their hosts of the benefits of community-led sanitation in their home villages having observed a need for such along the beaches they visited. However, it was not only successes that were shared. Exchange visits provide great opportunity to learn from mistakes made and how they were overcome, as Mr Roger the VA President stated, "It is always important to be self-critical in a constructive way... and look at ways in which Velondriake needs to improve and how Mozambique can learn from that." Some such issues raised during this trip included the ongoing need for education and awareness raising throughout communities, the importance of including communities at all stages of consultation and decision making in order to generate sustainable support for activities, and trying to cope with migrant fishers that are not always aware of the local laws governing Velondriake.

Overall, the exchange visit was considered a success by both parties, with Mozambican guests leaving feeling enthused about the LMMA approach and willing to apply the lessons learned in Madagascar in their own home villages. The departing message from the VA was clear and powerful, "Don't ever be discouraged; there will always be people that don't agree with what you propose, but you must remain positive and keep going. This work is really important and eventually you will get everyone on board." In the months since the visit, the exchange villages in Mozambique have reflected on experiences of their visit and gone on to implement their first octopus closures.

15.4 Useful resources:

- Blue Ventures has written a number of blog posts that describe different peer-to-peer exchange they have facilitated, e.g.
 - <http://blog.blueventures.org/seeing-is-believing-western-madagascar%E2%80%99s-first-community-exchange-for-marine-conservation/>
 - <http://blog.blueventures.org/divided-by-sea-united-by-vision/>
 - <http://blog.blueventures.org/coast-to-coast-fisher-exchange-from-reef-octopus-to-spiny-lobster/>



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Stage 3: LMMA Implementation

Introduction to Stage 3

19. Enforce Rules and Conflict Management

17. Create a Management Committee

20. Monitoring Progress

18. Create a Management Plan

21. References



Introduction to Stage 3

The third stage of LMMA creation involves putting plans into action. A management committee is usually created to do this, with individuals appointed roles and responsibilities. A management plan also needs to be put in place, detailing the LMMA activities and objectives and when it is expected these will be achieved. Both the Committee and the Plan are important to provide structure and accountability, to ensure plans are well thought out and understood to help the LMMA run smoothly in practice.

Implementing the LMMA requires instituting rules and regulations, and the importance of these is presented in this stage as well as recommendations for enforcement of LMMA rules. In addition, potential sources of conflict need to be identified as well as methods to resolve such disagreements. Finally, the importance of monitoring for a CBAM approach is highlighted. Guidance on monitoring approaches is presented, and step-by-step instructions on how to monitor the LMMA suggested.

By the end of this stage you will have:

- Put together the LMMA management committee and the management plan
- Decided on LMMA rules and regulations and plans for their enforcement
- Understood the potential for conflict, its sources and considered resolution mechanisms
- Put together a monitoring plan, identifying indicators and methods and who is responsible for monitoring





17. Create a Management Committee

17.1 What is a management committee?

A management committee is a legitimate and democratic community-based organisation that forms the management structure of the LMMA. The committee plays a very important role in the LMMA, being responsible for planning, budgeting and implementing all aspects of the LMMA including the LMMA management plan ([see Stage 3: Chapter 2 'Create Management Plan'](#)).

The committee will be the focal point of contact for all other LMMA partners and stakeholders.

The structure and composition of the management committee will depend on the context of the LMMA: the number of villages represented; their sizes; the governance system; and the legal framework the LMMA is managed under (each come with specific requirements for management structures). The aim should be for the committee to be representative of the communities within the LMMA. In an LMMA encompassing more than one village, often each village will elect by vote one or more villager to be a member of the management committee. The committee is comprised solely of villagers, representing each village. All permanent residents of the LMMA villages are, by right, also members of the committee being able to participate in meetings and other actions since they benefit from the LMMA. However, usually it is only the elected members who take part in the normal day-to-day activities of the management committee.

Being a member of the management committee can be time-consuming, especially on top of other day-to-day livelihood activities. This should be discussed with committee members, and plans made for committee activities to fit around existing commitments. It may be the case that it is decided some form of compensation for time spent on committee work is needed - whether this be in the form of food or benefits from the LMMA (e.g. fines accrued from penalties), or financial payment that is factored into the LMMA budget - needs to be decided. As with any form of financial compensation, it is important expectations are managed carefully and benefits are discussed widely first, so as not to create any perceived unfairness ([see Stage 1: Chapter 4 'Key Principles of MMAs'](#)).

The roles and responsibilities of the management committee are to:

- Represent LMMA communities to NGO partners, funders and other stakeholders: presenting issues and concerns of the communities
- Communicate LMMA activities and plans to other community members and stakeholders
- General awareness raising of LMMA activities within communities, e.g. importance of sustainable resource management
- Collaborate with NGO partners for LMMA planning and implementation, including devising the management plan and financial management

- Assist local communities in Dina enforcement
- Manage and resolve conflict
- Assist with LMMA monitoring and evaluation e.g. collecting data on resource use within the LMMA, such as catch effort
- Develop local-level sustainable finance strategy with NGO partners
- Submit a periodic report to regional authorities

17.2 How to establish a management committee

The broader LMMA community, i.e. all villagers that the LMMA encompasses, elects the management committee members. Technical partners/NGOs can be responsible for explaining the purpose of the committee, and for overseeing the elections if necessary. Elections are usually organised by the village president(s), and communities often have existing protocols for such events. These are usually local context specific and so there is no right way to organise an election, but key is to try and ensure processes are fair, communicated widely (held during times when the majority of villagers are available to take part), and people are in agreement with the process and result.

Given the role of the committee and tasks it performs, it is helpful if committee members meet some or all of the following basic criteria. These criteria should be explained before elections take place at the village level:



- Be literate
- Have a background in/basic knowledge of resource management
- Be sociable and respected (have a good reputation in the village)
- Be available, i.e. not someone who will be often absent from the village or have other, more pressing, commitments
- Represent both genders and all groups/clans including minorities
- Willing to work
- Interested, capable
- Be involved in fishing so can understand the community's needs, issues and the state of their resources

The composition of the management committee depends on the structure of the LMMA, i.e. the number of villages that comprise the LMMA. If only one village is contained in the LMMA, the management committee will include only representatives from that village. However, if the LMMA combines several villages then the management committee will contain representatives from each village. In some cases, representatives from villages are organised into different regional committees (e.g. North, Centre, South) that then report to an elected central executive committee.

Once members of the committee are elected they can then organise themselves into different components, for example:

- **A General Assembly (GA):** the committee as a whole (i.e. all members). The GA reviews financial accounts and defines overall management plan and budget. The GA elects members for the executive committee.
- **The Executive Committee (EC):** sets the work plan, oversees the work of regional committees and general LMMA managers. Links together the regional sub-committees and partners. The executive committee has its own president, secretary, treasurer and counsellors (all other members), i.e. the president of the EC is the overall president of the management committee.

- **Regional Sub-Committees (in larger multi-village LMMAs):** representing regional sub-divisions of the LMMA. The regional committees are responsible for carrying out the work in their respective areas, as defined by the central committee and GA. Each regional committee has a president, secretary, treasurer and counsellors.

N.B! This is only an example of a committee structure, committees can and will vary depending on the LMMA structure and context. For example, in Antongil Bay in North East Madagascar, several villages have individually set up smaller LMMAs governed under Dina only. Each of these village-level LMMAs has its own management committee, but coordinates with neighbouring LMMAs on broader management issues through a regional federation of fishers. Such a structure can help to build capacity and opportunity for learning between small LMMAs.





17.3 Management committee meetings

Meetings are a very important component of the management committee's activities. Meetings provide the forum for members to discuss management activities, build the action plan, evaluate current actions and discuss and agree on future activities. Meetings also allow for members to become familiar with each other and build team skills.

Management committees should meet at least once a month, although in some cases this may be too frequent for some villagers to attend (such as those travelling long distances) in which case every 6-8 weeks is recommended. Meetings should be arranged at least a week in advance to ensure all participants are informed and can make arrangements to attend. It is important account for factors that can delay meetings or hinder their attendance, for example village responsibilities or weather conditions might delay meetings or communication failures and ability to access funds might affect attendance. Given this, meeting arrangements should allow a degree of flexibility but nevertheless be arranged to maximise frequency and attendance.

A few key tips for management committee meetings to work effectively are [1]:

- **Notification** of meetings should be given in advance so that all members are well aware of the time and location to attend. Where possible, a meeting agenda and necessary reading materials should also be distributed in advance so that members can prepare sufficiently to contribute.

- **Participation** from everyone during the meetings should be encouraged. It might help to use seating arrangements that encourage participation, such as a U-shaped seating position. The use of name cards can help when attendees do not know one another. Monopoly of any discussion should be discouraged, if people dominate the conversation they should be restricted to a maximum time to speak before it is another person's turn.
- **Set norms** for behaviour at the first committee meeting, and stick to them.
- **Have an agenda** for each meeting, scheduling important items first. Don't allow unrelated discussions during meetings.
- **Allocate time** for each issue's discussion according to its importance.
- **Be punctual:** start and end meetings on time. If the agenda isn't complete when time is up, negotiate a time for further discussion.
- **Summarise:** Conclude each meeting with a summary of what is to be done next and by whom.
- **Document:** Assign somebody (usually the secretary) to take minutes of each meeting; this includes items raised, people contributing to the discussion and decisions made. This is a skilled task, and one that benefits from practice to ensure all the important points are captured and noted in time. Include identification of those given tasks/follow up actions, what the task is and when it is required to be completed. Minutes can be tidied up and compiled after the meeting, when they should then be sent to all members.

- **Be fair:** Ensure follow up/facilitation tasks are shared equally amongst members. Be very specific about the nature of the actions and their deadlines. Make sure everyone gets credit for the accomplishments of the committee.
- **Double-check for agreement** on important issues, but don't discuss, re-discuss, and continue to discuss items. Ensure decisions are made, even if consensus cannot be reached. It may help to take a vote if agreement cannot be reached.
- **Be Open:** Ensure opposing points of view are sought and heard.
- **Be fun!** Allow some social time following each meeting, providing refreshments can aid this time and allow for team bonding.

17.4 Tips for effective management committees

The key to a good management committee is to allow for capacity to be built over time, a smooth-running committee is hard to achieve from the outset. However, to maximise efficiency there are a few key points to keep in mind:

- A good understanding of the communities helps when forming the management committee, as prior knowledge of their skills and knowledge can help to divide the community into different groups that focus on those skills to benefit the committee. For example, it might not be necessary that it is only the most educated people that



form the committee, some people may not be literate (though this can be worked around with semiotics) but might be very effective at public speaking, or courageous enough to enforce the Dina; others might be young and not involved in decision-making, but might be literate and engaged in report writing or accounting.

- The role of the technical partner (NGO) is to support the committee, to lead by example so that every action is training for the committee members, helping to build capacity over time so that the committee can function independently in the future.
- Strong but broad leadership. The Committee's success or failure will often hinge on the qualities of the leader. It is important that support partners recognise this and support in an appropriate way through training and mentoring, but also that other potential leaders' capacity is also built up to reduce dependency on certain individuals.
- Don't overload the duties; balance the responsibilities with the time-period of the project.
- The committee should be 100% involved in every step of LMMA creation and implementation.
- Ensure that that everybody on the committee knows what their role is and what the overall purpose of the committee is, and that they agree with it.
- Ensure the committee knows that members who are not right for the committee, or who do not participate can be removed from their position.

- Understand and exercise your rights and responsibilities as a Committee
- New members should be properly inducted and mentored so that they understand their role and responsibilities.
- Don't push people to take on more than they are willing to.
- It can be very helpful to rotate jobs amongst members, to maintain enthusiasm.
- Ensure good communication between members, that everybody is aware of progress and new developments.



17.5 Useful resources:

- Worldfish (2013) Community-based marine resource management in Solomon Islands: A facilitator's guide. Based on lessons implementing CBRM with rural coastal communities in Solomon Islands (2005-2013). CGIAR Research Program on Aquatic Agricultural Systems. Penang, Malaysia. Manual: AAS-2013-17.
 - Module 4 provides a lot of detail on management planning; p30 in particular introduces information on management committees.
- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapter 10 p171-177 provides some useful pointers on creating management bodies, negotiating procedures and developing a common management mission.





18. Create a Management Plan

18.1 What is a management plan?

An LMMA Management plan defines the objectives and priorities for the management of the resource in question: it outlines the data and information available on the status of the resource, including its exploitation and the socio-economic interests attached to it; and it specifies the management measures in place to ensure the sustainable management of the resource.

A management plan makes the LMMA goals, as defined in the previous stage of LMMA creation ([see Stage 2: Chapter 2 'Consider Impacts'](#)), a reality. It is the written specification of how management will be implemented, from which management strategies will be used and where, to who is involved and how.

The management plan defines clear work contracts by stating the roles and responsibilities of individuals, their deliverables and accountability. The plan also outlines accounting procedures, including planned budget and annual expenditure.

Essentially, the management plan is the written form of all the processes described in this Resource Kit. Specific formats for management plans are required for TGRN or protected areas under the CoAP. Given the breadth of information it contains, a management plan can be a complicated and technical document to compile. Usually it is the role of the Technical partner/NGO to lead the development of the management plan with the full input of the management committee.

Despite the often-complex process and final product, it is also important to find ways of communicating the contents of a management plan with the wider community.

Creating a management plan is important as it helps to [2]:

- Improve the use of valuable resources by setting priorities
- Provide continuity in case of staff changes
- Increase accountability
- Fulfil obligations with regards to legal framework for LMMA management (CoAP or TGRN)
- Improve communication with all stakeholders
- Ensure management decisions are based on clear understanding of the LMMA's goals and objectives.

18.2 How to create a management plan

By this stage of LMMA creation, much of the management plan's content will have been decided on, and so now needs to be formalised within the written plan. This includes:

- Identification of stakeholders and their roles ([Stage 1: Chapter 1 'Identify Stakeholders'](#))
- Identification of the resource problem ([Stage 1: Chapter 3 'Identify Problem'](#))
- Analysis of the situation and identification of goals and objectives ([Stage 2: Chapter 2 'Consider Impacts'](#))

- Identification of strategies and definition of management actions ([Stage 2: Chapter 3 'Choose Management Tools'](#))
- Description of legal framework ([Stage 2: Chapter 4 'Consider Legal Options'](#))
- These will have been decided through an on-going process of meetings and workshops with the communities in question ([Stage 1: Chapter 2 'Engage Stakeholders'](#)). With this information compiled, it is useful to draw up a planning matrix to frame the management plan ([see Box 18.1](#)). The aim of the matrix is to reach an agreed and feasible plan of action that will serve as guidance for the community's actions and a reference point for monitoring the project's progress.

A **planning matrix** states:

- Each problem or objective
- The proposed solution and the activities necessary to achieve the solution
- States clearly who is responsible for each identified problem/objective
- When the work should be completed by
- How the work should be communicated back to the committee.



Further information that is described later in this Resource Kit is also formalised within the management plan:

- The monitoring and evaluation plan ([Stage 3: Chapter 4 'Monitor Progress'](#))
- Feedback mechanisms ([Stage 4: Chapter 1 'Keeping up Momentum'](#) and [Stage 1: Chapter 5 'Exchange Information'](#))
- Budgets ([Stage 4: Chapter 3 'Sustainable Financing'](#))
- Timelines/Calendars ([Stage 4: Chapter 4 'Timeline'](#))

The planning matrix helps the management committee to define calendars of activities and budgets. Budgets largely comprise details on the cost of fuel, transport, accommodation and food, equipment and per diem/ salary allocated to the management committee and other staff if relevant ([see Stage 4: Chapter 3 'Sustainable Financing'](#)).

Box 18.1 How to create a planning matrix (adapted from [3])

The management committee should draw up the planning matrix, with the facilitation of the Technical Partner/NGO (this can also include any village members not on the committee but with useful knowledge to input).

Step 1:

Divide the participants into groups that make best sense to help task be most effective, for example it might be best to group together the fishers, the elders, women, youth, business owners etc. Whether and which groups to use will depend on the local setting, but should be easily recognisable.

Step 2:

Assign one (or more, depending on the number) of the groups to each of the prioritised threats and problems identified during Stage 2 of LMMA creation (Stage 2: Chapter 2 'Consider Impacts').

Step 3:

Ask each group to then:

- a. Discuss the threat/problem assigned to them and what, if anything has been done to address them;
- b. Discuss the proposed solution and draw up the list of activities, processes and steps that need to be taken to address the threat;

- c. Identify who is the appropriate stakeholder/group or person that will need to take the lead in implementing the solutions, and
- d. Estimate a timeframe or dates when it is estimated the task should be completed by.

Step 4:

Allow as much time as possible for the groups to work through the questions and fill in the planning matrix (see sample below).

Step 5:

Ask each group to present their filled in matrix to the wider group and discuss their reasoning. Encourage the other participants to give advice with the aim of gaining wider group agreement on the suggested plan. Encourage the group's presenter not to worry if other people disagree or things need to be changed, and to welcome feedback as this is a group effort.

Step 6:

Collate the agreed matrix tables from each group into one master matrix. This should then be presented to the village(s), perhaps during village meetings, to discuss further and ensure consensus before implementation continues.

Step 7:

After all communities have agreed on – and committed to – the matrix, hard copies of the master matrix should be presented and saved by the management committee. During the next committee meeting discussions should focus on the next steps, finalizing the management plan and implementing actions.

Sample planning matrix

Sample Planning Matrix	Prioritised threat/problem	What has to be done to address the threat/ Problem?	Solution: What strategies? Solution: What activities?	Who to implement? (which stakeholder group)	Timeframe for implementation?	Who is responsible for overseeing?	How should updates be reported back?



18.3 Useful tips!

- The planning matrix should be as specific and detailed as possible, with descriptions of each step to be taken and clear timelines.
- Despite the above, remind participants that the planning matrix is not set in stone. Details can be adapted as implementation of the LMMA proceeds and develops ([see Stage 2: Chapter 1 'Be Adaptable'](#)). If a plan does not work and needs to be changed it is not a cause for concern.
- Do not assign stakeholders to roles and the people responsible for overseeing without their clear agreement and reasonable expectation that they can fulfil it.
- Full commitment from affected stakeholders is needed to best achieve the LMMA goals and objectives. It is helpful to publish the matrix on posters to increase the awareness and commitment of the communities and to inform outsiders of activities.

Threats / Problems identified	Proposed solutions		Who's responsible for the task?		When to be implemented
	What has been done about the problem?	Proposed tasks to resolve the problem	Within the district	From outside the district	
Destruction of reef	Nothing has been done about this	Awareness campaign about how coral destruction is not beneficial to the community	Workshop participants Environment committee	Fisheries Officer A, (FAB-Research Unit, Officer B) OISCA	December 2002
Overfishing	Have put aside reserve marine areas for village A, B and C	<ul style="list-style-type: none"> ■ to be gazetted by government ■ fishing ground demarcation ■ selection of committee and fish wardens ■ monitoring of marine reserve areas 	Village and Tikina Council meetings and "Bose Vanua"	Provincial Council Meeting Native Lands Commission Fisheries FAB	Within six months and to be monitored annually
Duva (plant fish poison)	Use of "duva" has been banned in a village meeting	Fish wardens to strictly enforce law and resolution by the village council	Fish Wardens Environment Committee Chief	Fisheries Provincial Office	1/02/2003

Table 18.1 Example of a completed planning matrix [3]



18.4 Useful resources:

- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapter 10.9 'Co-Management Plan – Goals, Objectives, Activities' p179-185 gives detailed information on management plans as well as helpful tips on objectives and activities.
- IUCN (2004) Managing Marine Protected Areas: A Toolkit for the Western Indian Ocean. IUCN Eastern African Regional Programme, Nairobi, Kenya. p. xii + 172pp.
 - Sheet C3 'Management Plans' provides useful information and guidance, albeit specific to marine protected areas.
- Mahanty S, Stacey N (2004) Collaborating for Sustainability: A resource kit for facilitators of participatory natural resource management in the Pacific.
 - Module 6: Topic 6.3 provides advice for preparing a work plan.





19. Enforce Rules and Conflict Management

19.1 The importance of rules and regulations

To achieve their stated aims and objectives, LMMAs require resource users to change their behaviour, such as abstaining from fishing during reserve closure periods. To do this, rules and regulations must be defined and agreed on by the community, during community consultations ([see Stage 1: Chapter 2 'Engage Stakeholders'](#)). The rules and regulations for the LMMA will be specific to the management tool that has been adopted ([see Stage 2: Chapter 3 'Choose Management Tool'](#)), for example:

- Bans on the use of certain fishing gears
- Prohibited to enter & fish in permanent reserves or during temporary closures
- Rules regarding fishing quotas
- Species-specific rules regarding fishing practices

When forming rules, participation by as many community members as possible should be encouraged to ensure a high level of community support and ownership. The rules and regulations of the LMMA will be outlined by the legal mechanism, which in Madagascar is most commonly the Dina. Given the traditional use of Dina in the country, communities are familiar with procedures to establish and enforce these customary laws. Where possible, it is best to follow these well-established procedures. For the LMMA to be effective, the rules and regulations will need to be respected. If rules and regulations are widely disagreeable, they will be difficult to enforce.

19.2 Communicating rules and regulations

If rules and regulations are to be respected, they must first be understood and supported by the communities. This means they must be well communicated to ensure all villagers are aware of the new restrictions in place. Tips for raising awareness and educating villagers about rules and regulations, and the LMMA legal mechanism in general, are as follows:

- Conduct village tours; hold committee meetings, meetings with local government authorities, other stakeholders and consultations/workshops with the communities. Think creatively too, such as distributing leaflets or showing films or presentations about the LMMA and its rules and regulations.
- Use existing, and so recognised, mechanisms of communication such as village meetings. Ensure leaders and well-respected community members/religious groups are involved.
- Distribute (laminated) copies of the signed, legalised rules and regulations to all village presidents and committee members, as well as to other stakeholders and partners incl. local govt. Ensure their support for the rules and regulations, and for enforcing them.
- Put together a pack containing: the legal mechanism, rules and regulations, management plan including planning matrix, committee statutes etc. with map of area including reserve zones. Give a pack in solid casing to each committee member and village presidents, and place for public viewing in the LMMA central base, if there is one.

Widely communicating the rules and regulations institutionalises the LMMA and its legality in each village. This makes the leaders of each village accountable to the larger management committee for application of the rules and regulations in their village, and for reprimanding transgressors.





19.3 What is enforcement?

Rarely will rules and regulations just be decided on and respected; more often than not they will need to be enforced. Enforcing is the process of ensuring compliance with the rules and regulations and is very important to LMMA success. Enforcing requires catching rule-breakers and imposing a penalty for the infraction, such as paying a fine, having fishing gear confiscated or being banned from fishing for a length of time.

To catch rule-breakers it is necessary to instruct people to monitor or guard the LMMA for people not respecting the rules and regulations. However, paying a guardian of the LMMA to monitor for rule-breakers is likely to be financially prohibitive for the communities; instead all community members should be considered guardians of the LMMA. In this way all community members should be encouraged to report those breaking the rules and regulations to the LMMA management committee.

Penalties need to be strict enough to deter rule-breakers, but not so strict as to encourage dissatisfaction and dissent amongst community members. As with the rules and regulations, the communities need to decide for themselves how to enforce the rules and which penalties to apply.

The technical partner (NGO) might make suggestions, but the community themselves must decide on how to monitor for rule-breakers and what the most appropriate punishment is for their setting.

To do this, communities should remind themselves of the common community LMMA vision, i.e. the reason why management was desired in the first place, and decide how

people who do not act for the common vision ought to be reprimanded. The aim of such penalties is to change human behaviour, and reduce the chances of the infraction being repeated.

It is important to establish clear steps for enforcement and the penalties to be incurred at this stage of LMMA creation, to avoid future delays and/or confusion if a perpetrator is caught once implementation is underway.

Suggested steps to enforce rules and regulations are as follows:

- 1 At first, sometimes just a verbal or written warning will deter the offender(s).
- 2 With continued offences, report the offender(s) to the LMMA Management Committee. Report the infraction in an infractions log.
- 3 The management committee announces the offence to the village presidents and other leaders, and begins an investigation.
- 4 The village president calls for an enforcement meeting.
- 5 Villagers debate the offence in the enforcement meeting, and agree on the final fine for the offender(s). Minutes of the enforcement meeting should be written up and archived to serve as evidence.
- 6 The enforcement committee follows up on the fines.
- 7 The enforcement procedure stops once the fine is paid.

19.4 Tips for enforcement

Some tips to help enforce the rules and regulations are as follows:

- Keep a record of all rule-breaking activities in an infractions log. This can just be a book in each village office or the LMMA centre. Not only will this help to keep track of whether fines are paid, but will also allow for monitoring of increase or decrease in infractions over time ([see Stage 3: Chapter 4 'Monitor Progress'](#)).
- Tiered fines can be an effective means of discouraging repeat offences while showing compassion for a first time offender, and thereby not creating feelings of resentment for the management committee. An example of a tiered fine is: A fine is set at 100,000 Ariary. However, a first time offender is fined 20,000 Ariary, second time 50,000 Ariary with the full fine of 100,000 Ariary charged on the third offence.
- If the offender is unable to pay the full (or tiered) fine at the time of enforcement it is important to insist on at least a partial payment (e.g. 10,000 Ariary), to help reinforce the message that the offender has agreed they have done wrong, and is committed to paying the fine.
- Illegal catches from the reserve should be confiscated and sold/shared out. The communities, not the management committee alone, should decide how this is shared out.
- Confiscating fishing gear until a fine is paid is not always effective, often the person may need the gear to earn money to pay the fine.



- Sharing fines between people attending meetings can improve trust in the project and the management committee, and encourages participation in meetings.
- It is important to stress that fines are meant to act as a deterrent to poaching from the reserve, and should not be viewed as a fundraising tool; the ultimate goal should be zero infractions.
- If all fails, although it might seem heavy handed, it can be effective to bring in the local authorities to raise awareness of the rules and regulations, their relevance to national laws and the penalties of breaking them. This is particularly important when infractions appear organised by outside groups or if enforcement by the community is deemed to risk the safety of community members.
- Be safe when enforcing rules and regulations, try not to be aggressive or use weapons as this might only aggravate the offender and initiate a hostile confrontation.
- Be creative, think about deterrents and surveillance methods that might not be too expensive. Deterrents might include visible warnings and recorded sounds, and surveillance might include using existing structures as watching stations in which people rotate shifts to keep watch at night.
- It is important to remember that most people who break the rules and regulations do so because have few alternatives, no other form of income. This problem is hard to solve through fines only, and should be considered as part of the longer-term LMMA approach for example within alternative livelihood projects.

Barriers to effective enforcement can be the existence of preferential treatment by enforcers for family members or those with political power/influence in the community. Villagers may be fearful of applying a penalty for fear of causing offence.

Outsiders (people not from the LMMA villages/migrant fishers) are also a known problem for enforcement. It can be difficult to enforce rules and regulations on people who do not consider themselves a part of the village laws or Dina. These are not easy problems to solve, but tips to try and find a solution include:

- New arrivals must always meet the village president, who will describe the LMMA and its rules and regulations to them and sign their passbook (a passbook is a requirement in Malagasy villages).

- Families hosting new arrivals/migrants are aware that they are responsible for informing their guests of the LMMA and its rules and regulations, and for ensuring they respect them.
- That new arrivals/migrants are aware that if they do not respect the rules and regulations the president will enforce the full penalties, regardless of migrant status.
- In the case of repeated infractions from outsiders it might help to set up a meeting with the leaders of these outside villages. Explain the situation and negotiate with the leaders so that they can first try to address the problem within their own jurisdiction. If this fails, arrange for village leaders from the LMMA communities and the outsider communities to meet and try to discuss and reach a solution.





- If reaching a solution between villages does not work, it might be helpful to enlist the assistance of the local authorities to inform the outside villagers of the rules and regulations and penalties for not respecting them.

If non-compliance with the LMMA continues to be a problem, it might be useful to hold an enforcement workshop:

- Invite committee members, village presidents and leaders as well as villagers that are known to break Dina as participants to a workshop to discuss how better to apply the LMMA rules and regulations.
- Reiterate the rules and regulations in the workshop. Explain how they are vital for the sustainable management of the resource, and that this is being carried out at community request over concern for the resource. Ask villagers to identify the problems with current resource use, and to show how the LMMA rules and regulations address these.

- Assess weaknesses in the rules and regulations, and how better to enforce them. Ask rule-breakers for their opinion. Come up with an action plan for better enforcement such as:
 - Holding further village meetings to explain and educate about the LMMA and legal procedures.
 - Adjust penalties accordingly to improve compliance.
 - Collaborate with any local crime security/enforcement groups to enforce the rules and regulations. Malagasy villages often have a local militia formed of villagers to defend against bandits and cattle rustlers, known as Kalaony. This is especially useful to help overcome fear of reprisals, especially in enforcing rules and regulations to outsiders.
- After the workshops ensure the decisions made are explained to all villages during village meetings, to ensure full consultation and villager consensus and support.

19.5 Useful resources:

- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapter 12, Section 4 (p225-227) provides an introduction to the process of law enforcement.
- IUCN (2004) Managing Marine Protected Areas: A Toolkit for the Western Indian Ocean. IUCN Eastern African Regional Programme, Nairobi, Kenya. p. xii + 172pp.
 - Section G2 describes enforcement in marine protected areas.
- Worldfish (2013) Community-based marine resource management in Solomon Islands: A facilitator's guide. Based on lessons implementing CBRM with rural coastal communities in Solomon Islands (2005-2013). CGIAR Research Program on Aquatic Agricultural Systems. Penang, Malaysia. Manual: AAS-2013-17.
 - Module 4, p31-35 provides guidance on management rules and controls, penalties and enforcement.
- Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources of the Department of Agriculture, and Department of the Interior and Local Government (2001) Philippine Coastal Management Guidebook Series No. 3: Coastal Resource Management Planning. Coastal Resource Management Project of the Department of Environment and Nature Resources, Cebu City, Philippines, 94 p.
 - P58 discusses law enforcement
 - Available online: http://oneocean.org/download/db_files/crmguidebook3.pdf



19.6 What is conflict?

Conflict occurs when there is a, often protracted, disagreement or argument between one or more people or groups of people. Given the breadth of interests at stake regarding natural resources, and the number and type of different stakeholders involved, it is common for conflict over LMMAs to arise.

Conflict can arise in many situations, for example disputes over:

- The location of LMMA boundaries (e.g. between local and industrial or migrant fishers).
- The different uses of gear (e.g. traditional methods versus more destructive but effective practices such as beach seining).
- The transparency of financial transactions (e.g. allegations of corruption within management committee).
- Development versus conservation (e.g. new hotel within or nearby LMMA).
- Latent family and relation disputes (e.g. ongoing disputes affecting management procedures).
- Elitism (e.g. imbalance of power/duties/profits to wealthier/better educated people or those with political power).
- Politics (e.g. allegiance with an existing or new local leader conflicting with the LMMA management structure).

- Continued rule-breaking/lack of cooperation (e.g. difficulty enforcing outsiders/recent settlers/repeat-offenders).
- Build-up of resentment if rules and management perceived to be unfair
- Cultural conflicts (e.g. between locals and migrants).
- Disagreement in management approach/expectations between stakeholders (e.g. community dissatisfaction with technical partner/NGO).

19.7 How to identify conflict?

Some sources of conflict can be present before the LMMA is created, such as disputes over gear use or existing strains in personal relations. Other sources of conflict might not exist before the LMMA but rather arise as a result of its implementation. Such sources of conflict need to be either identified or avoided to limit the negative and destructive effects they might have on LMMA implementation. Being able to recognise conflict, understand its causes and develop the skills to manage it is a very important aspect of good management [4].

Conflict may have many stages, reflecting its severity or duration. For example [4]:

- **A conflict is hidden or underlying** when it has not been openly recognised by the parties involved, but there are undercurrents and tensions between stakeholders.
- **A conflict is emerging** when it becomes more obvious to the parties involved, and also perhaps to other parties/individuals not directly involved. Tensions are being expressed perhaps through parties avoiding contact, holding informal discussions or forming alliances.
- **A conflict is visible** when it is publicly recognised and full-scale. This may involve outright hostility, complaints, and other forms of public disagreement.

To best manage a conflict it helps to catch it in its earliest stages, however these types of conflict can be hard to recognise given they are not usually public at this stage. Signs to look out for might be non-participation by individuals or groups in meetings, or alliances being formed in meetings against certain individuals or parties. To avoid conflict before it has started yet it is best to ask communities during consultations whether they can think of any potential sources of conflict with LMMA creation, and explore suggestions with the parties involved.

19.8 How to manage conflict?

When attempting to manage and resolve conflict it is important to ask as many questions as possible about the people involved and the conflict, and to analyse people's expectations for conflict management. Other tips for conflict resolution include:



- Clearly define roles. Who will be acting as mediator for the conflict?
- Recognise there will be differing perspectives
- Identify mistakes
- Watch out for emotional triggers
- Focus on preventing escalation
- Take action to control the situation
- Commit to working it out
- De-escalate the conflict
- Stay calm

The South Pacific Regional Environmental Program's (SPREP) International Waters Project (IWP) guidelines suggest the following steps when trying to resolve a conflict [5]:

- 1 Gather as much background information as possible on both the parties involved and the conflict itself. Discuss the issue separately with each party and make clear the intention to resolve the conflict.
- 2 Arrange a meeting for all parties to gather and discuss the conflict, at a mutually convenient time.
- 3 During the meeting:
 - Invite each party to explain their position clearly. They should be permitted to do this without interruption. Allow clarifying questions after each party has

explained their position. Identify areas of agreement or similar interests and areas of disagreement or conflicting interests.

Suggest and seek agreement on a common overall goal for negotiation (a solution). Compile a list of possible options to meet that goal, and evaluate each of these options against criteria that are agreed as important to both parties (e.g. threats to the resource, livelihoods, etc.)

Facilitate an agreement on the options that satisfies both parties. Help the parties determine a process to implement the agreement, including a timeframe and responsibilities.

- 4 After the meeting, write up any decisions made and ensure all parties sign the agreement.

When attempting to resolve a conflict, it helps if the parties involved are willing and prepared to negotiate. Other conditions to encourage for a successful resolution include [5]:

- There are some common issues and interests on which the parties are able to agree
- Parties demonstrate a willingness to resolve their conflicts
- Parties are willing to compromise to some degree
- Parties feel some pressure or urgency to resolve the conflict
- The issue is negotiable
- The parties have some authority to actually make a decision

- Any agreement reached is feasible and achievable.

However, it is important to remember that it may not always be possible to resolve a conflict, but listening to each parties' perspective can help to lessen the conflict or ease strains on relationships [4].

19.9 Lessons learned for enforcement and conflict resolution

Some lessons learned from existing LMMAs in Madagascar regarding enforcement and conflict management include:

- LMMAs based on Dina are strengthened by the previous use and respect of Dina as a legal tool at the village level
- Rules and regulations legitimised at the village level are better respected than those imposed from higher levels such as local or regional government.
- The community-led nature of rule and regulation formation strengthens support for management by reflecting livelihood needs and being founded in traditional governance.
- Despite the above, there are likely to be divisions both within and between villages that can create conflict.
- Outsiders, or migrant, fishers is one of the biggest sources of conflict in an LMMMA. Enforcing local village laws on outsiders can be very difficult and requires sensitive management.



- Local politics greatly impact the effectiveness of enforcement and LMMA management and should be carefully understood and respected.
- Stakeholder engagement, education and awareness raising regarding the LMMA and its rules and regulations is a continuous, ongoing process and is not limited to any one stage of LMMA creation and management.

19.10 Useful resources:

- Mahanty S, Stacey N (2004) Collaborating for Sustainability: A resource kit for facilitators of participatory natural resource management in the Pacific: 246.
 - Module 2: Topic 2.6 'Understanding and managing conflict' gives an overview of conflict, its potential sources and methods to address grievances.
- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapter 11 'Conflict Management' provides detailed descriptions of different types of conflict and how best to manage conflict.
- Means K, Josayma C (2002) Community-based forest resource conflict management: a training package. FAO, Rome.
 - This training package provides in-depth guidance and analysis on conflict management, which while focussed on forest systems remains relevant to the wider management of natural resources.
 - Freely available to download in sections via <http://www.fao.org/docrep/005/y4301e/y4301e00.HTM>





20. Monitoring Progress

20.1 What is monitoring?

To monitor is to observe and check the progress or quality of something over time. This provides a record of activities and measures the impact of LMMA actions on outcomes. Monitoring allows for you to know whether what you are doing is working, and so is essential for an adaptive management approach. This is because monitoring enables the impact of management actions on complex ecological and social systems to be better understood, so that management can then adapt based on this changing understanding to improve long-term outcomes.

20.2 Why is monitoring important?

Monitoring is important not only to track progress in LMMAs activities, but to improve their effectiveness in the long term. It also allows for this progress to be better communicated to stakeholders and funders, thereby helping to raise public and political awareness, stimulate action and motivate the communities involved.

Designing and implementing monitoring programmes can be complicated, appearing 'scientific' and very technical. As such, it can be hard to communicate the importance of monitoring to communities, who might see it as an added burden on top of management activities that are already time-consuming. Careful communication regarding the purpose of monitoring can help to gain trust. As with every step of LMMA creation and management, it is vital to consult with communities extensively at every stage of monitoring, from deciding what to monitor to interpreting findings. Tips for communicating the importance of monitoring include:

- Emphasise that the purpose of monitoring is to measure how well the LMMA is working, and to improve it over time to maximise success. Remind communities of the time and effort involved implementing the LMMA, and the restrictions being placed on fishing behaviour. These would not be worth it if it were not possible to show these 'costs' actually benefit the communities in the long term.
- In terms of gaining trust, it is helpful if a member of the community or management committee, who grasps the concept of monitoring and the approaches to be adopted, explains the process to the wider community.
- Where possible, participatory monitoring is encouraged (see below). This is when the community members themselves, rather than 'experts' that might be perceived as outsiders, conduct all stages of monitoring. As part of this process, communities determine how they will know if the activity is working, what they will measure, how they can measure this, and how it be best to present this information to the rest of the community

20.3 Participatory monitoring

A CBAM approach to LMMAs requires a community-based approach to monitoring. Participatory monitoring engages all stakeholders in the process of monitoring, rather than monitoring being conducted by scientists or technical experts from outside the project. In most cases, these stakeholders will be the community members themselves that conduct monitoring, from design and implementation to analysis and informing.

However, usually this will take place in collaboration with the technical partner, who provides training and guidance and help to interpret data [6].

Participatory monitoring provides many benefits, not least helping to engage and include communities in the management process, making it more responsive to community needs, as well as increasing local skill sets. Participatory monitoring can also be a more cost-effective approach, requiring lower labour, transport, subsistence and accommodation costs than technical (non-local) experts over the long term [7]. However, initial costs can be high as it is likely that training will be required before communities can carry out monitoring independently.

20.4 What to monitor?

Given the complexity of ecological and social systems, it can be difficult to measure everything of interest to natural resource management. Instead, indicators of these systems are often measured to simplify the process of monitoring.

Indicators are specific pieces of measurable information that serves as substitutes or proxies to indicate the state or level of the wider system. For example if knowledge of the effectiveness of management is needed, the number of rule infractions enforced might be used as a proxy of effectiveness. This would most likely require simply counting the number logged infractions enforced, and totalling the number at set time periods to provide an indicator of effectiveness over time.



Deciding on the best indicators might take time but careful decision is a valuable exercise, as establishing good indicators will reduce the amount of information that needs to be collected and ensure best use of limited resources (see 'monitoring complexity' below). A good indicator should be Specific, Measureable, Achievable, Relevant and Time-bound (S.M.A.R.T.) [8]:

Specific – The indicator should be something particular and discrete, and reflect the objective.

Measureable – It must be possible to measure and interpret the indicator without ambiguity, and must be comparable across survey staff, across projects and across time.

Achievable – It must be possible to measure the indicator with the resources and tools in at hand, and in the time available.

Relevant – The indicator must relate to the value that is of interest to the project, which is relevant to the objective.

Time-bound – Results from the indicator must be accessible within the monitoring timeframe, and if monitoring a trend it should specify when the change occurs (e.g. yearly change).

LMMA's operate within both ecological and social systems, and so monitoring both biological and socio-economic impacts of management are important for an adaptive management approach. This is because, for adaptive management, it is necessary to be able to attribute these impacts to the management action(s) that have been implemented, that is, to be able to gauge whether

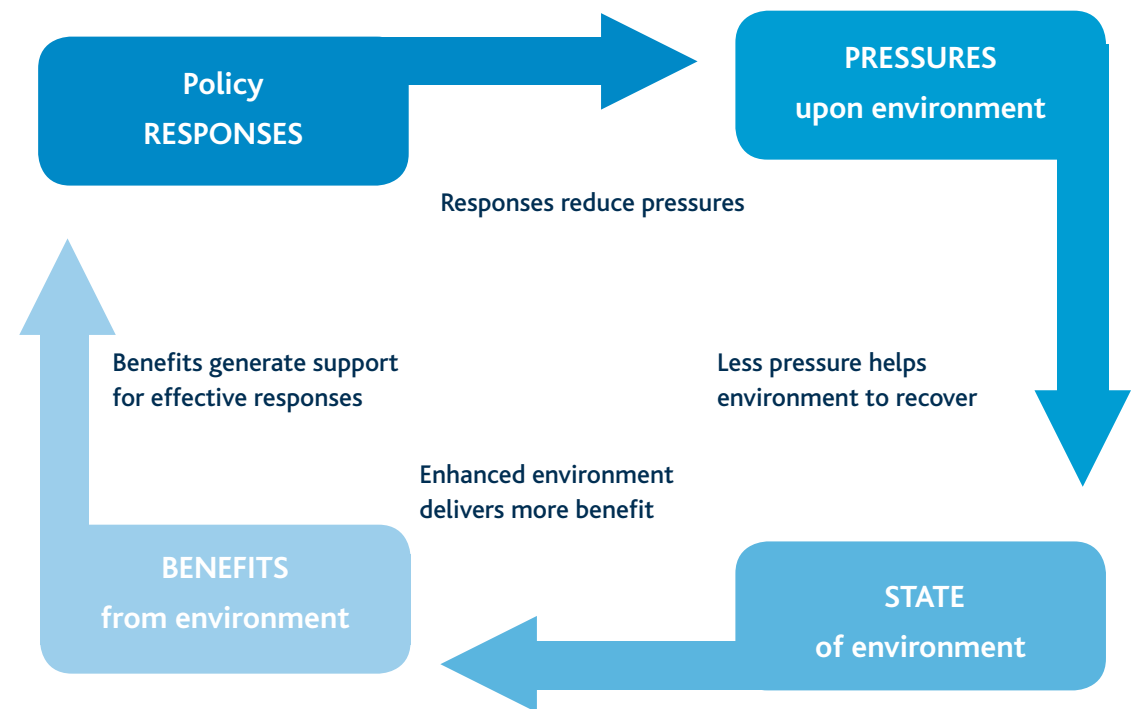


Figure 20.1 Schematic diagram showing the Pressure-State-Benefits-Response approach to natural resource monitoring (adapted from [10])



these actions are working or not, and why. A commonly used monitoring approach to help with this attribution conceptualises environmental systems in terms of Pressures, State, Benefits and Responses (PSBR framework) [9]. This framework states that human activities exert pressures on the environment (e.g. land use change and resource use), which influence the state of the environment (e.g. changes in habitat diversity and species abundance). These changes in state then affect the ecosystem services, or benefits that they provide (e.g. clean air and water, good soil and food) which in turn motivates society to respond by implementing policies and activities (e.g. LMMAs) to reduce pressures and thus better manage the environment and its benefits (Figure 20.1)

This PSBR framework not only helps to narrow down and define what to monitor, but also helps to understand the ecological and social system as a whole, and not just the state of environment in isolation. Monitoring across PSBR indicators (Table 20.1) helps to understand changes in the environment, and their causes, thus helping to attribute changes to management actions and so improve these actions over time.

Indicator Type	Example Indicator	Example Method
Pressure		
Fishing pressure	Fisher numbers	Household surveys, Fisher interviews, landing surveys
	Access to Market	
	Gear type	
	Fish catch per unit effort (CPUE)	
Land use	Coral bleaching exposure	Underwater visual surveys, remote sensing
Social sensitivity	Fisheries dependence	Household surveys, Fisher interviews, landing surveys
State		
Ecological resilience	Coral cover	Underwater visual surveys
	Fish biomass	
Benefit		
Catch	Fish CPUE	Household surveys, Fisher interviews, landing surveys
Wealth	Household assets	
Health & Food security	Diet diversity	
Response		
Coverage	Area under management	Mapping surveys
Effectiveness	Infractions enforced	Enforcement record book, Household surveys, Fisher interviews, landing surveys
	Community awareness of rules and regulations	

Table 20.1 Example LMMA PSBR indicators and their monitoring methods.



20.5 Monitoring complexity

Monitoring programmes can appear highly technical, requiring a high level of scientific expertise. The complexity of the LMMA monitoring programme will depend on the level of human, financial and technical resources that are available:

- **Human resources:** The personnel required to carry out a task, including the labour required for training and implementation and the skilled personnel needed.
- **Financial resources:** The cost of carrying out the task, including the cost of equipment, staff, data handling and acquiring specialist skills.
- **Technical resources:** The technical specifications required by the tasks, including specialist equipment and analytical software.

These resources are often not available at the community level. Given the community-led nature of LMMAs, it is best to begin with a monitoring plan that isn't too complicated for community members to understand and is low-cost for communities to be able to implement themselves. Often, LMMA monitoring programmes are a mixture of scientifically rigorous monitoring led by the technical partner and simpler monitoring carried out by community members themselves, with the guidance of the technical partner.

Establishing successful participatory monitoring can be very hard, and at first communities will require training and careful assistance from the technical partner. Given the aim of LMMAs is to be community-led, participatory monitoring should not be too complex for communities to conduct

accurately and repeatedly. As with every stage of LMMA creation this requires close contact with the communities throughout, building communication and relationships so that any problems encountered are quickly reported and worked on. It can help to begin with simple questions, and develop a monitoring plan from there, for example asking villagers:

- What makes a good fishing day?
- How have fish numbers changed in the past year? In the past 5 years?
- What is your opinion of the LMMA? Do you think it is working?

Decisions regarding which approach is best should be taken with the communities, as they can best identify their role within the monitoring programme. For example, in the case of an octopus reserve, villagers themselves are well placed to carry out simple observational monitoring of octopus landings on reserve opening day by recording the following landing data:

- Total weight of octopus caught
- Number of people/fishers involved in catch
- Time spent fishing
- Gear used
- Fishing location
- Sex and weight of a sample of individual octopus

While the above represents a basic form of community monitoring, more advanced monitoring of an octopus reserve carried out by the technical partner will require an understanding of the situation before management intervention (i.e. the reserve) was implemented. This is known as the **baseline**. Baseline measurements provide a starting point from which change can be measured against. By monitoring the system before and after management is implemented, it is possible to measure change and makes it possible to analyse whether that change is due to the management. For example, with more resources a technical partner might conduct monitoring of an octopus reserve using a BACI design: Before-After-Control-Impact. This requires monitoring of catch data in both reserve and non-reserve sites (i.e. control sites, that should be similar in size and diversity to reserve sites) before and after reserve implantation. Change in catch data between reserve and non-reserve sites after implementation of management can then be compared.

Baseline monitoring can also be used to identify where management efforts are best placed, i.e. the most suitable habitat for maximising benefits of management to target species. However, community desire for the location of a reserve may outweigh this.

While baseline measurements are advocated for best-practice LMMA monitoring, it might not always be possible to implement and this will depend on the communities involved. If community motivation is strong and reserve closure is desired ASAP, it might be best to harness that motivation without the delay of monitoring, which can take a lot of time. In such cases it is worth weighing up



the benefit of baseline measurements with the potential benefits of the LMMA. Consider at this point the use of any secondary data already in existence, or collecting historical accounts of fish catches from a sample of community members to compare to post-reserve monitoring data.

20.6 How to monitor?

To establish an LMMA monitoring programme it is useful to ask “Why?” “What?” and “How?” to monitor, with particular reference to your LMMA. A first step to answering these questions is to discuss them with the LMMA management committee, as well as any other key stakeholders already known to be important for monitoring. Then, once consensus has been reached these questions and answers can be presented to the wider community and other stakeholders, to ensure full understanding and that agreement is reached before monitoring takes place.

Steps to establish monitoring of the LMMA with the management committee are as follows [11]:

1 Discuss the reasons for monitoring

Ensure the purpose of monitoring is well understood by all concerned stakeholders, in particular community members (as described above).

2 Review LMMA objectives

A monitoring programme needs to be founded on clear and well-defined objectives to be effective. Remind the committee of the objectives of the LMMA, as decided during Stage 2 of LMMA creation ([Stage 2: Chapter 2 'Consider](#)

[Impacts'](#)). Objectives are the formal statements of the outcomes, and are the changes that are desired to achieve the LMMA goals. Reviewing the objectives at this step helps to answer the questions raised in the following steps.

3 Develop monitoring questions

With LMMA objectives listed it is now helpful to work backwards from each goal and outcome, asking, “What do we want to know?” For example, the outcome ‘improved enforcement each year’ might have the objective ‘yearly increase in percentage of rule infractions enforced’, which means the monitoring question will be, “what are the number of infractions enforced each year?” List all the questions that are raised.

4 Select monitoring indicators

Having identified the questions that need to be answered by monitoring, the next question to ask is “What do we need to measure to tell us this?” For each monitoring question decide on an indicator that will answer it. For example, an LMMA objective might be to ‘increase reef health’ for which there is no direct measure of ‘health’. In this case one or more proxies of health can be chosen, that indicate the health status of the reef, for example hard coral cover or reef fish biomass.

The choice of indicator is an important one. Monitoring questions might have multiple indicators that could be measured to answer them. However, it is best not to choose too many indicators so that monitoring does not become a burden. Which to choose will depend on the resources available for monitoring.

5 Select monitoring method(s)

Monitoring requires collecting data on the indicators, and the choice of data collection method will be directly influenced by the indicators themselves, as well as the resources available to measure them (see ‘what to monitor’, below). Some methods might help to harness information on more than one indicator, and thus help to minimise costs. For example, socio-economic surveys can gather data on multiple issues of interest such as resource use and income. Standard survey methods for socio-economic and ecological monitoring exist, and there are a few methods that are commonly used in marine environments (see Box 2). Despite their utility, however, surveys can be expensive, require a high level of understanding in design and development of the instrument itself and the statistical analysis at the end, and place an unfair burden on communities to answer questions, especially when surveys are repeated over a short time frame.

6 Decide who will carry out the monitoring

Who will carry out the monitoring will depend on the methods chosen and the level of skill required. While many methods can be taught, certain basic skills such as literacy and numeracy will be necessary. Identify the people with the skills useful for each task; some people might be better suited for data analysis and presentation whereas other people might be better suited to the more manual tasks of executing the monitoring in the field. It can be useful to organise those identified into a monitoring committee, with individuals assigned to particular roles and tasks.



When making these decisions, emphasise that monitoring can be time-intensive, and ensure everyone is aware of the demands on their time it will mean. It might be necessary to discuss some form of compensation for carrying out monitoring, however be mindful of creating a culture of expectation ([see Stage 1: Chapter 4 'Key Principles of LMMAs'](#)).

Step 7: Analyse the data

Monitoring involves gathering data, and these data will need to be stored and analysed to be able to interpret findings and check progress for an adaptive management approach. Where possible, data should be digitised and archived. This then makes data more easily accessible over time, and also makes it available to stakeholders and LMMA partners. For example, an LMMA network such as MIHARI might host a shared database that each project can contribute to and analysis can be carried out on, creating an evidence-base for LMMA effectiveness at a larger scale.

Data analysis can be simple, such as percentage change/year in rule infractions over time, giving an indication of the effectiveness of enforcement and compliance. However, analysis can be also be much more complex and require specific expertise, such as using statistical modelling to ascertain with more confidence the relationship between data, e.g. does illegal resource use decline with increase in income? The complexity of analysis chosen will depend on the expertise available to the LMMA. It is best to decide now the level of analysis required to measure progress towards LMMA goals, and who is best placed to carry this out.

Digitising and archiving data means that more complicated analyses can be carried out in the future, even if not immediately possible due to lack of resources or expertise.

Step 8: Present the results

Presenting monitoring results is very important. Results should be shared with all stakeholders, to help maintain momentum, to meet funder requirements, to address critics and to encourage wider adoption of the LMMA approach. At the least results should be discussed at community meetings, with updates posted within villages. Ideally, compiling yearly project reports for distribution helps to spread LMMA progress to wider stakeholders.

It is important to remember that results might not always be positive, and might not show progress towards LMMA goals. However, these results are still very important and should still be shared with audiences. Being truthful with such results helps to harness trust, as well as to demonstrate that management is a learning process and that lessons learned help to catalyse improvements, not just for the LMMA in question but for wider efforts to manage natural resources.





Box 20.1 Monitoring methods

Standardised monitoring methods need to be carefully designed, as this helps to make data more reliable as well as replicable across time and spatial scales. It is important that methods are standardised so that results can be compared over time. For example, if more time were to be spent monitoring in one year than the next it would not be possible to determine whether the difference in results between years was due to this time difference, or due to the management action. Often standardised units are measured to help with this, such as Catch Per Unit Effort (CPUE) rather than just 'Catch'.

Thus, when considering methods and survey design it is necessary to control as many influencing variables as possible to increase confidence that changes are due to management and not any other factors. Often this means monitoring both 'control' and 'experiment' sites, as a BACI design would.

Commonly used monitoring methods include:

Biological monitoring – underwater visual surveys:

- Belt transects
- Quadrats
- Point or Line intercept line transects
- Timed counts
- Socio-economic monitoring:
- Household and individual structured (or semi-structured) questionnaires

- Key informant semi-structured interviews (e.g. fisher interviews)
- Focus groups
- Fisheries monitoring:
- Landing surveys
- Catch surveys (although not always possible)
- Fishing effort assessment (Frame surveys, BAC or Active Days)
- Market price monitoring

New technologies

The use of mobile technology is expanding across Madagascar, as it is in other WIO countries. To increase the uptake and ease of monitoring, many conservation organisations are now harnessing this technology in their monitoring initiatives, both for expert technical staff and for use within participatory monitoring programmes.

Mobile monitoring involves using standardised electronic forms on mobiles and tablets for monitoring, which are usually freely available to download. Forms are designed with the community to match their capacity, helping to overcome illiteracy barriers by use of pictures and simple touch screen response forms. The use of electronic forms also helps to standardise responses across large samples, making data analysis much easier. Solar chargers can be used in remote areas, and data can be stored on the handset before reaching an area with mobile signal to be uploaded to a central online database.

Thus mobile data collection helps not only to improve the quantity and accuracy of more traditional pen and paper methods, but also the speed of data collection, with the instant electronic format making data download and storage faster and cheaper across larger distances. This improves the time in which management can respond to monitoring results.

Blue Ventures are currently using mobile technology within some of their monitoring initiatives, with plans for expansion. A factsheet on describing the approach can be freely downloaded:

- In English <https://blueventures.org/publication/mobile-data-collection-factsheet/>
- In French: <https://blueventures.org/publication/la-technologie-mobile-mise-a-contribution-pour-ameliorer-la-gestion-des-petites-pecheries/>

In addition, Blue Ventures has compiled a User Guide to Setting up Mobile Data Collection using the online data collection tool ODK (Open Data Kit). For further information regarding this User Guide email enquiries to info@blueventures.org.



20.6 Useful resources:

- Govan, H., Aalbersberg, W., Tawake, A., and Parks, J. (2008). Locally-Managed Marine Areas: A guide for practitioners. The Locally-Managed Marine Area Network.
 - p41-58 provides detailed user-friendly guidance on the importance of monitoring, selecting indicators, sampling and survey design and monitoring methods applicable to both biological and socio-economic monitoring.
- The Conservation Measures Partnership (2013) Open Standards for the Practice of Conservation. Version 3.0.
 - Chapter 2B provides details on developing a monitoring plan and selecting indicators.
 - Chapter 3 describes implementation of monitoring, including data handling and analysis.
- The Pacific LMMA Network has created a community biological monitoring training video that clearly presents the reasons for monitoring, and how to monitor. Applicable also to the WIO region, the video also provides useful guidance on using different transect methods (belt transect, quadrat and point intercept line transect methods and time counts).
 - <http://lmmanetwork.org/resources/videos/>
- Pomeroy RS, Parks JE, Watson LM (2004) How Is Your MPA Doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness. IUCN, Gland, Switzerland and Cambridge, U.K. xvi + 216 p.
 - Very useful guidance on developing a monitoring plan including selection of indicators and monitoring methods.
 - Provides detailed descriptions of potential biophysical, socio-economic and governance indicators.
- Freely available online: <http://marineprotectedareas.noaa.gov/pdf/national-system/mpadoing.pdf>.
- IUCN (2004) Managing Marine Protected Areas: A Toolkit for the Western Indian Ocean. IUCN Eastern African Regional Programme, Nairobi, Kenya. p. xii + 172pp.
 - Sections G1-11 describe the principles and practicalities of monitoring and evaluation, including descriptions of potential ecological and socio-economic indicators and monitoring methods.
- Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources of the Department of Agriculture, and Department of the Interior and Local Government (2001) Philippine Coastal Management Guidebook Series No. 3: Coastal Resource Management Planning. Coastal Resource Management Project of the Department of Environment and Nature Resources, Cebu City, Philippines, 94 p.
 - Chapter 6 provides detailed guidance on monitoring and evaluation.
 - Available online: http://oneocean.org/download/db_files/crmguidebook3.pdf
- Monitoring Matters Network: <http://www.monitoringmatters.org/>
 - An online international network of researchers and practitioners working with innovative approaches to monitoring of natural resources, livelihoods and governance.
 - The website provides useful information regarding the importance of monitoring and different initiatives around the world, as well as peer-reviewed publications on the subject of monitoring.
- Stamatopoulos C (2002) Sample-based fishery surveys: A technical handbook. FAO Fisheries Technical Paper. No. 425. Rome, FAO.
 - Detailed, technical guidelines on fisheries monitoring from the FAO.
 - Available online: <http://www.fao.org/docrep/004/y2790e/y2790e00.htm#Contents>
- Sutherland, W. J. 2006 Ecological Census Techniques: A Handbook. Cambridge University Press.
 - This practical handbook provides guidance on planning and conducting surveys with worked examples, including how to analyse the results and expert descriptions of monitoring methods.
 - Available online: http://www.ecolab.bas.bg/main/Members/snikolov/Sutherland_2006_Ecological_Census_Techniques.pdf
- Royal Geographical Society (RGS) Field Technique Manuals
 - The RGS has published a series of manuals providing guidance on how to conduct field surveys.
 - Freely available online: <http://www.rgs.org/OurWork/Publications/EAC+publications/Expeditions+and+Fieldwork+Publications.htm>
- Pilgrim J, Ekstrom J, Ebeling J (2011) Biodiversity Impacts Guidance: Key Assessment Issues for Forest Carbon Projects. In: Ebeling J, Olander J, editors. Building Forest Carbon Projects. Washington, DC.: Forest Trends. p. 30.
 - While this report is highly technical and specific to forest carbon projects, it provides useful guidance on choosing biodiversity monitoring indicators and methods.
 - Freely available online: http://www.forest-trends.org/publication_details.php?publicationID=2555



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 - Freely available online: http://www.forest-trends.org/publication_details.php?publicationID=2555
- Lund JF, Larsen HO, Chhetri BBK, Rayamajhi S, Nielsen ØJ, et al. (2008) When theory meets reality—how to do forest income surveys. Hørsholm: Forest & Landscape Denmark.
 - This report is specific to conducting forest-income surveys, however it provides very useful practical guidance on preparing and implementing household surveys; including sampling approaches, questionnaire design, issues regarding sensitivity and trust and advice regarding standardisation of information.
 - Freely available online: http://r4d.dfid.gov.uk/PDF/Outputs/ESRC_DFID/60612_workingpapersno29.pdf
- Blue Ventures are currently compiling (as of 2015) a decision tree to help decision-making when deciding what and how to monitor according to habitat. For further information, email enquiries to: info@blueventures.org





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9. OECD (1993) OECD core set of indicators for environmental performance reviews.
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Stage 4: Ongoing Management

Introduction to Stage 4

22. Keeping up Momentum

23. Scaling and Replicating

24. Sustainable Financing

25. References



Introduction to Stage 4

Now that LMMA plans have been put into action, and management is underway, this fourth stage of LMMA creation focuses on recommendations to assist with ongoing management. Community-based adaptive management never really finishes; it is a continuous process of learning and improving management. In addition, if implementation is successful it might be desirable to upscale the LMMA model to new communities that have identified a need for resource management. This fourth and final stage discusses these aspects of LMMAs.

Also at this stage of LMMA creation, the Technical Partner might start to take a step back from management and hand over greater responsibility to the communities.

By the end of this stage you will have:

- Ideas to help keep up community momentum for ongoing management
- Scaling and replicating the LMMA model
- Options for sustainable financing of LMMAs
- How long the LMMA creation process might take





22. Keeping up Momentum

The hard work does not stop once the LMMA is implemented and activities are set up and running, equal effort ought to be placed in maintaining community support for the LMMA to ensure its long-term success. This means keeping up momentum in the long-term, to help management processes such as monitoring, communication and enforcement continue to run smoothly.

22.1 Tips for keeping up momentum

These tips should be communicated clearly to LMMA managers so that they also can help to maintain community support:

- **Celebrate the successes!** Share success stories, not just with the communities but far and wide. Try to encourage press coverage (e.g. newspapers/radio) of positive outcomes, or create outlets for progress to be shared. For example, hold 'Community LMMA days' for other nearby communities to come and learn about the LMMA approach. Big or small, every positive outcome should be shared and celebrated to encourage confidence and continued commitment to the LMMA, not just from the communities but from other stakeholders such as government or private industry partners.
- **But, don't be afraid to share when things do not go to plan.** It is important to be open and transparent about progress, good or bad, as it only helps the process of learning and adapting that is vital for CBAM. LMMA success depends on this process of adaptation, not on getting things right the first time.
- **Encourage continued activities** even when processes are being managed smoothly. This might be through regular village meetings to present progress, or regular meetings with other stakeholders, or larger events such as LMMA network meetings. This helps to ensure processes do not become stagnant, and communities continue to see LMMA activities.
- **Encourage regular meetings** between major stakeholders. Meetings between communities and major stakeholders (administrators, technical partners and commercial stakeholders) should take place regularly (e.g. at least annually) to discuss LMMA progress. This provides a setting for communities to present monitoring data indicating progress, as well as for the management plan to be reviewed as a group. This also provides a useful forum to discuss any new or continuing obstacles or opportunities that the major stakeholders might be able to assist with.
- **Don't break the connection with the community.** Even if the community is able to manage the LMMA solely without technical assistance, it is good to maintain regular contact to sustain support for the LMMA, as described above.
- **Continue looking for ways to improve.** Regularly assess the overall sustainability of the LMMA and identify gaps in capacity for independent management. Looks for ways to address this both within the community and at local and regional levels. Training and capacity building can be an important motivating factor for engagement in the LMMA's development.





22.2 Don't forget the key principles!

At this stage of LMMA creation, it is important that technical partners and LMMA managers are reminded of the key LMMA principles presented at the first stage of this Resource Kit. Ideally these principles will have been maintained at each stage of LMMA creation and will now be useful to help ensure processes remain sustainable, especially as the communities themselves take on greater management responsibilities:

- Remember the community motivation and incentive to participate in management activities. Assess this frequently throughout the project lifecycle, as it is likely to change as the project evolves. For example, novelty might have been a big motivating factor at the beginning of the project, however as responsibilities grow and success rates change this might affect attitudes. It is important to constantly assess these attitudes and discuss roles, responsibilities and distribution of project benefits at regular intervals (e.g. at least annually) at open community meetings and major stakeholder meetings.
- Continue to manage community expectations. Expectations regarding benefits can be high, not just at the beginning of a project but throughout. For example, expectations regarding economic benefit might increase if the LMMA is seen to have large successes

and more resources. It is important to ensure any benefits are felt fairly across communities, and these are well communicated. Also consider expectations regarding duties and workloads, project sustainability and timings, as these are likely to change as the project develops.

- Maintain local community ownership of the LMMA to ensure the community-led nature is felt strongly throughout. Continue to encourage the full participation of communities so that project benefits are linked to community efforts.
- Communication remains key! Continue to communicate project aims, progress and plans to stakeholders and wider audiences. Use novel means where possible, encourage community LMMA events and press coverage of success stories. Discussing activities and incorporating stakeholder views will help to both uphold the LMMA principles and long-term sustainability.

22.3 Useful resources:

- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapters 12.6 and 12.7 onwards (p228-237) provide useful guidance for ongoing evaluations and networking and advocacy.



23. Scaling and Replicating

If after some time both communities and other major stakeholders perceive the LMMA a success, plans might develop to scale up the model and replicate it elsewhere. Given the challenges of sustainable resource use extend across Madagascar, and the wider WIO region, Replicating and scaling up examples of successful approaches is needed.

Due to the community-led nature of LMMAs, each project is likely to be context specific and so there is no one way to replicate an LMMA so that the same successes can be achieved elsewhere. However, the aim of this Resource Kit is to provide some guidance as to the key processes required when setting up an LMMA, thus helping with this process of scaling and replicating. In addition to these key processes, some important considerations to keep in mind are:

- **Document activities** as much as possible. Keep records of meetings with stakeholders, write down what did and did not work and tips for communicating and working with communities. If possible develop monitoring protocols in detail so that they can be easily replicated, and data across sites compared. Provide templates where possible, such as for progress reports and committee meetings so that projects can be compared easily.
- **Communicate** the approach and its effectiveness to a wide audience, including political, academic and civil networks. Attend meetings and conferences. Reach out to, and join, wider LMMA/resource management networks, conduct further peer-to-peer exchanges so that experiences can be shared and learned from.
- **Build networks and strengthen ties.** Gaining wider community and political support can have significant impact on the adoption and success of an approach. If

new legislation has been made, and/or a precedent for government support established, share this so that such successes can be replicated.

- **Develop communication tools** to help spread the message. Capture the LMMA at work using videos and photographs, share widely using posters, online blogs and media sources including newspapers and radio.
- **Ask stakeholders** what they thought worked well, if there were any processes they particularly enjoyed, or any aspects they might do differently with the benefit of hindsight and learn from this.
- **Continue to evaluate** LMMA progress against set objectives at regular intervals, such as every six months or annually. Evaluations should involve all major stakeholders so that all opinions are expressed.

23.1 Handing over responsibility

LMMAs should be managed 'for the community, by the community', and so eventually the technical partner(s) will have to step back from the management activities, and hand over increasing responsibility to communities. This does not mean a sudden withdrawal, but rather a slow and organised process of reducing direct input that can take a period of several years. In fact, it is vital that support is not withdrawn completely or suddenly, as this is very likely to hinder any progress that has been made. A relationship with the communities has been formed, and it is important that this continues, to maintain trust and momentum.

This process of 'phasing out' should be well managed and well communicated to the communities, so that all parties are aware of intentions and changing roles and responsibilities. A plan of at least five years should be compiled, together with communities, that documents this shift in roles and outlines planned activities and objectives for this period. This may have to be reviewed after this period, depending on progress. At all times the community should be aware that the technical partner is available to provide assistance upon request.

23.2 Useful resources:

- Pomeroy, R.S., and Rivera-Guieb, R. (2006) Fishery Co-Management: A Practical Handbook. International Development Research Centre.
 - Chapter 13 onwards (p233-237) provides useful guidance on considerations for post-implementation, including a case study detailing the phasing out of a community-based project in the Philippines.
- Govan, H., Aalbersberg, W., Tawake, A., and Parks, J. (2008). Locally-Managed Marine Areas: A guide for practitioners. The Locally-Managed Marine Area Network.
 - Chapter 4 provides guidance for ongoing CBAM.



24. Sustainable Financing

Being able to finance the LMMA is vital; yet it is important to remember that having adequate financial resources is not the only factor that will help to make an LMMA sustainable in the long term. There are a number of additional factors – mostly concerned with community and other stakeholder support and motivation – that are important for the long term sustainability of LMMAs, for example [1]:

- Community members have the desire to manage
- Communities are receiving benefit from management
- Communities have been empowered with skills and knowledge
- Community management committees exist and are functioning
- Supportive policies and legislation are in place
- The local government is supportive
- Public awareness is widespread and participation is active
- Widespread agreement of the management plan
- Continual monitoring and adaptation of the management plan
- Continued communication of management progress
- High level of compliance with management measures
- Adequate financial resources and budget

24.1 Potential sources of funding

Obtaining adequate finances to oversee LMMA costs can be challenging. The LMMA's Technical Partner, through donations and external fund raising, usually finances LMMA start-up costs and a large proportion of running costs. However, the long-term aim of LMMAs is that they be run and managed as much by communities as possible. It may not be possible for a Technical Partner to fully relinquish financial responsibility, however there are some means by which self-sustaining finances might be achieved by the communities:

■ Charging fees on NTZ opening days

On opening days fishers can be charged a fee that is linked to the size of their catch. The fact that the fee is directly linked to a benefit the fishers receive helps to make it more amenable to fishers, and easier to enforce. A fee/kg needs to be agreed by the communities beforehand, and widely communicated to minimize confusion and potential complaints on opening days. If enforcing at the village-level proves difficult, it might be possible to enforce at the point of sale. That is, buyers deduct the fee from the purchase price, and pass this on to the LMMA Management Committee afterwards.

■ Fines accrued through enforced rule-breaking penalties

People who break the rules and regulations of the LMMA are charged a penalty for these infractions, as described in Stage 3: Chapter 3 'Enforce Rules and Resolve Conflict'.

■ Blue carbon projects

As described in [Stage 2: Chapter 3 'Choose Management Tools'](#), mangroves store very large amounts of carbon in their biomass and sediments, known as 'blue carbon'. This carbon has a value on international markets, and if realised can help to both incentivise and fund community-led mangrove management, and safeguard the fisheries that mangroves support. Policies aimed at Reducing Emissions from Deforestation and Degradation (REDD+) are currently being funded through voluntary carbon markets. These policies aim to reduce the rates of deforestation and degradation in tropical countries by making standing forests more valuable for the carbon that they store, than cut down for forest products such as timber, or cleared for land.

However, currently (as of 2015), REDD+ policies cannot be easily applied to mangrove forests because blue carbon has not been fully included in emissions accounting, and standards for blue carbon markets are still in their infancy. To help change this, research into the carbon dynamics of mangroves is underway, helping to develop robust accounting methods for future blue carbon projects. Given this, with time and further research, blue carbon projects will present significant potential for funding the management of mangroves and their fisheries.

In addition, if significant finance is realised, such projects might not only help to fund management, but also provide an additional income source to the people charged with managing the mangroves. However, REDD+ projects can be very difficult to implement, they require



robust research, extensive monitoring of carbon and benefits, clear property rights and equitable distribution of benefits to work well. For further information see:

- The REDD Desk: <http://theredddesk.org/>
- The Blue Carbon Initiative: <http://thebluecarboninitiative.org/>

■ Payments for Ecosystem Services (PES) projects

Marine, coastal and mangrove ecosystems provide a number of global benefits to human wellbeing, termed 'Ecosystem services'. These services include coastal protection, fisheries, recreation, carbon storage, waste treatment and weather regulation. All of these services provide a value, but rarely is this value measured or fully appreciated in current markets.

PES projects aim to address the continued decline in these ecosystems by providing incentive to protect them, through payments for the services that they provide. In this way, people who benefit from the ecosystem service (e.g. clean water users) pay the people who contribute to the generation of these services (e.g. upstream land users). PES is a voluntary transaction, by which a well-defined environmental service is bought by at least one buyer from at least one provider, on the condition that the service is actually preserved [2]. Thus, similar to blue carbon and REDD+ above, PES projects have the potential to not only provide funding for ecosystem protection, but also provide an additional income source for the people providing the service. Also similar to REDD+ and blue carbon, such projects are complicated to implement.

They require robust research and monitoring of the service, clear property rights and equitable distribution of project benefits to work well. For further information see:

- Forest Trends and Katoomba Group (2010) Payments for Ecosystem Services: Getting Started in Marine and Coastal Ecosystems. A Primer. Available online: http://www.forest-trends.org/publication_details.php?publicationID=2374
- IIED Briefing (2012) Payments for coastal and marine ecosystem services: prospects and principles. Available online: <http://pubs.iied.org/pdfs/17132IIED.pdf>

■ Fishing revenue

If catches could be stored and transported fresh there is there potential for fish stocks to reach higher-value national or international markets. However, the conditioning and transport of the fish to reach such markets is a significant hurdle to overcome to access this potential.

■ Aquaculture

As described in [Stage 2: Chapter 3 'Choose Management Tools'](#), aquaculture projects reduce pressure on marine resources, as well as provide alternative means of income for communities. Partnerships with private seafood industry and export agencies are required to connect the communities with international markets.

The aquaculture farms are usually fully owned and operated by the communities themselves, with the LMMA technical partner providing materials, training and technical guidance and assisting with start-up costs in partnership with private partners. Introducing new

aquaculture projects to communities can be challenging, with complex practices like with any type of farming. Strong technical partnerships are required, and training to gain practical experience. However, communities can overcome these challenges with support from private and NGO partner support.

Aquaculture can help to finance the LMMA directly by establishing agreements between farmers, technical partners and private partners regarding donations. For example, in addition to the negotiated sale price the private industry partners agree to donate a fixed sum per transaction to the LMMA.

■ Eco-tourism

As another alternative livelihood project, ecotourism projects can generate revenue for communities while also reducing pressure on the resource. For example, establishing tourist entry fees to the area can generate revenue for the LMMA. Ecotourism activities and requirements are described further in [Stage 2: Chapter 3 'Choose Management Tools'](#).

■ Eco-certification

Increasing consumer awareness for environmental issues and over-fishing has driven a number of eco-certification schemes, whereby consumers pay a premium for products that are certified sustainable. In the seafood industry the most prominent of these is Marine Stewardship Council (MSC) certification. With certification, the added premium (or a proportion of it) on the product could go to the fishers and the management committee.



To gain certification status however is not easy, and a fishery has to undergo a number of assessment activities before certification is awarded. Getting to the point of certification can take a lot of time and expense. For further information see: www.msc.org/.

■ Fisheries taxes

In Tanzania and Kenya a system of fisheries tax exists under what is known as Beach Management Unites (BMU). The BMU is essentially a local association, which creates by-laws regulating the fishery, and is also responsible for collecting taxes from fishers' catches. Half of the funds collected go to the government, with the other half going to support the functioning of the BMU. In Madagascar there exists a tax regime for seafood products caught by traditional fishers, although it is not clear how well this is enforced. If a mechanism for devolving this tax collection to fishers associations could be put in place, the collection of taxes could potentially be improved while also providing direct financial support to local management efforts. However, the extent to which fishers might support this tax system would need to be explored.

■ Trust funds [3]

Conservation trust funds (CTFs) are independent grant-making institutions that provide sustainable financing for biodiversity conservation and sustainable development. CTFs do not typically carry out conservation activities themselves, but work to mobilise funds from donors to implementing organisations meeting specific criteria.

■ Breakdown of LMMA costs

LMMA costs can be broken down into five major categories:

■ Functioning

Functioning costs primarily include the costs of holding regular management committee meetings, and meetings between the committee and other major stakeholders. This includes any location costs, supplies and accommodation needed, as well as any financial compensation for meeting attendance if that has been agreed within the LMMA.

■ Monitoring

This includes the cost of conducting both scientific monitoring of progress ([see Stage 3: Chapter 4 'Monitor Progress'](#)) and patrolling for infractions of rules and regulations ([see Stage 3: Chapter 3 'Enforce Rules and Resolve Conflict'](#)). Costs include everything from equipment for monitoring, data handling and storage, to transportation costs and staff.

■ Infrastructure

Infrastructure includes the physical demarcation of the LMMA boundaries, e.g. signs and buoys. This also includes the costs of establishing and maintaining LMMA-specific meeting places or visitor centres.

■ Technical support

Technical support primarily represents the costs of accessing (usually external) expertise to the LMMA, with this expertise usually provided by Technical Partner (NGO). This includes the cost of staff time and expertise; to both establish the LMMA as well as to oversee ongoing management.

■ Education/Outreach.

This includes the cost of communicating the LMMA and its progress, both within LMMA communities and further afield. Within villages costs can be low, as communication is primarily conducted within village meetings (included in functioning costs, above). The main costs of education and outreach incur when efforts are taken outside villages (e.g. peer-peer exchanges), and so includes transport, materials and accommodation.



25. References

1. Pomeroy RS, Rivera-Guieb R (2006) Fishery Co-Management: A Practical Handbook. 283 p. doi:10.1079/9780851990880.0000.
2. Wunder S (2006) Are direct payments for environmental services spelling doom for sustainable forest management in the tropics. *Ecol Soc* 11: 23.
3. Bladon, A, Mohammed, EY, and Milner Gulland, EJ (2004). A Review of Conservation Trust Funds for Sustainable Marine Resources Management: Conditions for Success. IIED, London.



We rebuild tropical fisheries with coastal communities

Blue Ventures develops transformative approaches for catalysing and sustaining locally led marine conservation. We work in places where the ocean is vital to local cultures and economies, and are committed to protecting marine biodiversity in ways that benefit coastal people.

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