

Recommendations from Ten Years of Monitoring under the LMMA Network's Learning Framework

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Introduction

The Locally Managed Marine Area (LMMA) Network works to improve the practice of marine conservation through building capacity in site-based marine resource management in the Indo-Pacific. Network members and partners have invested in community-based monitoring to help communities, field practitioners and the marine conservation and management sector assess the management effectiveness of LMMAs. One of the network objectives was to systematically learn about the conditions under which LMMAs are successful and a Learning Framework (LF) was devised to define the common information needs and assumptions.

After undertaking monitoring under the Learning Framework approach across multiple countries and sites over ten years, a number of recommendations have arisen from this experience. These recommendations draw from a series of reports and reviews of the successes and challenges of the approach.[†]

We offer these recommendations to anyone considering investing in, designing and implementing a large-scale monitoring programme involving communities, projects, and larger initiatives.

Background

The LMMA Network has been supporting practitioners and communities across Southeast Asia and the Pacific for 10 years and now encompasses 420 sites in 8 countries practicing "Community-Based Adaptive Management" (CBAM) to manage over 12,000 km² of coastal marine area. This adaptive management, or "learning by doing", involves communities implementing local management plans based on available information and then regularly checking progress and modifying their plans appropriately. By definition, CBAM is intended to be a community-led effort with assistance provided by project partners and in practice the actual approaches vary greatly from site to site.

The LMMA Network invested in promoting monitoring at three levels:

1. **Community/stakeholder learning for management:** as a method for communities to assess the progress or success of their management plans and to revise accordingly.
2. **Project or organizational learning for management and reporting:** as a method for projects and institutions/NGOs to assess the progress or success of their projects and to revise accordingly.

3. **Network-wide or “portfolio” learning:** to gain insights into factors for LMMA management success. The LMMA Network was initiated as a “learning portfolio” approach, asking similar questions across a core set of sites (~30) using the Network’s monitoring guide, its Learning Framework (LF).

Network-wide monitoring under the Learning Framework

The monitoring approach adopted from the outset was based on predominantly quantitative methods (though qualitative methods were also recommended in the LF) following widely accepted biological and socio-economic survey techniques, which were outlined in the Learning Framework (LF). The LF compiled more than 30 factors and 80 indicators which members considered relevant to understanding under what conditions LMMAs work best and provided guidance on how to monitor them. The network wide learning through LF was only intended for a subset of sites within each country. With the exponential growth of sites and the evolution of LMMA Network’s focus, the network-wide learning through the LF had to be evaluated. Though designed for the network or portfolio level, the LF also came to be used as basic guidance for monitoring undertaken at both community and project levels.

By 2007, monitoring was well under way at many sites and sufficient data were available for the first attempts at rigorous analysis at approximately 40 sites. Initial results for Fiji revealed areas of concern with respect to biological data collection, management, and analysis, which were generally supported by emerging experience in other countries. By 2010, some 16 reports[†] had been commissioned based on reviews specifically looking at the way monitoring was being conducted and used across the LMMA Network and the quality of the resulting data and information that was being generated.

While there are some successes in sites where monitoring and learning has worked well, the key findings of the reviews outlined below focus on the limitations and challenges of the LMMA biological monitoring effort that offers the most useful lessons to other monitoring initiatives. While the outcomes of the socio-economic monitoring seem to have followed the same pattern this has not been reviewed to the same extent as biological monitoring.

Findings and recommendations on LMMA Network Monitoring

Design monitoring to be simple and fit for purpose

1. Our experience highlights the vital importance of first investing in thoughtful consideration of what information is really needed to support management, what are the simplest ways of addressing these needs effectively and what the resource implications are over the long term.
2. Programmes, projects and communities need to design monitoring from basic principles - what is the purpose and audience for monitoring and what information is really needed in each case. This suggests that simply adopting existing methodologies or “packages” can result in generation of information not suited to purpose. Also, attempting monitoring for multiple levels of needs is highly challenging.

Biological monitoring was promoted for a variety of reasons including the needs of communities to be able to assess whether their management was working. However, membership of the network was conditional on implementation of the full LF and substantial effort went into its design and training for its use. This combined

with the LF complexity and its extensive list of data requirements conspired to detract to varying extents from answering, as a priority, the most fundamental question: is site based management working?

There were examples of monitoring being used for adaptive management in only a small minority of cases and overall there is no evidence across the majority of sites that monitoring data collected was used for decision-making in community adaptive management.

Clarify who the key information users are and ensure their needs are met appropriately

3. Effort should be prioritized to site based information and learning needs (as these are the fundamental unit of management in the Pacific) prior to consideration of cross-site or network learning. Without robust results at the site-level the aggregation and interpretation of data/information and learning to higher levels becomes highly problematic.
4. Explore and evaluate methods that are closely aligned to management objectives and that provide information to decision-makers in more inclusive or accessible ways, for example perception-based techniques and locally designed approaches.

Most of the monitoring data collected on ecological processes has been collected inside and outside of no-take MPAs as the core of the management strategies being implemented. Comparisons have then focused on inside-outside ecological condition. In reality, for many communities where fisheries benefits are key motivations, the priority interest is the improvement within a managed fishing ground over time. For government and those supporting conservation and management initiatives, the interest is to assess results between managed versus unmanaged control fishing grounds; not between different levels of management within one fishing ground.

Select appropriate methods including perception based approaches

5. Recognize that for improved learning and management, quantitative monitoring systems may not be the most appropriate approach. Other potentially more appropriate, cost effective and sustainable approaches to generating information should be considered including perception based approaches, less formal opportunities for learning (e.g., cross-site visits) as well as quantitative monitoring.

Most of the reviews highlighted inadequate biological monitoring designs due to confusions over purpose – as discussed above – and lack of suitable technical advice and human and financial resources. As a result, often the methods chosen as a part of the monitoring design were related to the larger questions being asked as part of the broad-ranging Network monitoring or global learning such as Reef Check, and were not appropriate for site-level questions. This increased, in many cases, the disconnect between intended information users – i.e., communities and project managers – from those designing and implementing monitoring activities and reduced the usefulness of data for site based adaptive management.

The majority of knowledge sharing and improved understanding in the Network has been achieved through more informal learning opportunities (e.g. sharing of experiences through cross-site learning). While this type of learning has been supported extensively by the Network, it has not been as well studied, documented and resourced as the more formal LF-based monitoring work.

Don't forget basic statistical principles such as Sample Design

6. Where statistical validity is a necessity ensure that sample design examines sample size and number of replicates before implementing monitoring.

The network learning design as embodied by the LF and driven by membership requirements led to an emphasis on quantity of variables rather than quality of data. Sample sizes were ultimately low and variances high. As a result, there have been instances within the Network where data collected from a low number of replicates with large variance contradicted everyday community observations. In fact, studies suggest that, for the methods used, unfeasibly high numbers of replicates would be required to achieve acceptable variances.

Design and, importantly, maintain robust Data Collection approaches

7. Keep monitoring as simple as possible - to minimize opportunities for mistakes, vulnerability to erosion or loss of skills and personnel turnover and misunderstandings on purpose of monitoring that can emerge over time.

Implementation of data collection and data quality control has demonstrated real challenges. Key issues have been the consistency and quality of data gathering, due to changing monitors, monitors with insufficient understanding of the methodologies, some ad hoc adaptation of methods without regard to the interpretation of the indicator concerned, and using training events to collect data.

One of the recurring discussions over the years has been on the ability of community members to collect useful data. A number of studies commissioned by the Network or its members have suggested that problems in data collection stem from the way data was collected and the sample design used rather than the skill and/or competency of well trained data collectors. Common problems in monitoring design include lacking or inappropriate controls and baselines, too few replicates, transects too close to each other, and lack of standardization, amongst others. The need for training and support for collection of quality data to address these issues adequately may have resource implications beyond those initially budgeted.

Invest and reinvest in Data Storage, Analysis and Communication

8. Where quantitative data are to be collected, then appropriate investment in data storage, analysis, and most importantly communication of results needs to be made. This should include recognition of the appropriate sustained level of technical assistance and financial resources needed. If monitoring information is not available when decision-makers need it, unsuitable decisions may be made, or none at all. At the same time, resource allocation supporting communication of “informal learning” to date and into the future needs to be undertaken.

While substantial investment and thought having been invested in collecting data, there was not enough attention to the mechanisms for storing data. Accordingly, what data was stored needed substantial cleaning prior to use. Indeed, some data were found to have been entered or stored in a way that it limited its future use (for additional or alternative analysis). Data analysis protocols, though well established, may not have appropriately addressed research questions and the wider purpose of monitoring. Where the Network has demonstrated quality data and good storage, this was due to active expert technical management.

Even in situations with relatively simple monitoring procedures, getting the data back to community decision-makers in a timely manner has been a huge challenge for some sites – depending on the monitoring mechanisms and structure in place.

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† List of reviews and reports relevant to LMMA Network data and monitoring: 1.) Cleofe, Dugan, Arroyo, Melchor. Sept 2007. Philippines LMMA Network Country Meta-Analysis & Data Presentation. 2.) Andy Rowe. Nov 2007. Review Of The LMMA Network. 3.) Ursula Kaly. Sept 2008. Preliminary MANOVA Results For Fiji LMMA Data. 4.) Ursula Kaly. Sept 2008. Preliminary Assessment Of Fiji LMMA Combined Raw Dataset (July-Sept 2008). 5.) Govan, Tawake, Comley, Vave. Oct 2008. Fiji Biological Monitoring Update And Proposed Next Steps. 6.) Tawake, Vave, Comley, Tan, Placci, Margoluis. Oct 2008. Suggestions For Capturing And Structuring Learning In The LMMA Network. 7.) Tawake, Govan, Comley, Placci, Meo And Vave. Oct 2008. Statements Summarizing What Is Known And Done To Date On LMMA Learning. 8.) Placci, Margoluis. Nov 2008. An Assessment Of LMMA Learning Framework Data Quality, With A Focus On Fiji LMMA. 9.) Cleofe, Dugan & Melchor. Sept 2009. Consultative Workshop On Setting Up Of Philippines LMMA Core Indicators & Management Effectiveness Indicators. 10.) Placci, Margoluis. Nov 09. An Assessment Of Indonesia LMMA Learning Framework Data And Analysis. 11.) Fiji Learning Team. Jan 2010. Proposed Revision To Fiji LMMA Community Monitoring Protocol (Still Being Revised). 12.) Vave, Margoluis, Placci. XXX 2010. LMMA Learning Agenda Consultation: Results Of The Learning Committee Discussions With Indonesia LMMA. 13.) Vave, Margoluis, Placci. Jan 2010. LMMA Learning Agenda Consultation: Results Of The Learning Committee Discussions With Philippines LMMA. 14.) Placci, Margoluis. Feb 2010. An Assessment Of Philippines LMMA Learning Framework Data And Analysis. 15.) Margoluis, Placci. Jun 2010. LMMA Learning Agenda: A Proposal For Moving Forward: Full Report. 16.) Margoluis, Placci. Jun 2010. LMMA Learning Agenda: A Proposal For Moving Forward: Summary/Findings And Recommendations. For more information or copies of these reports, please contact the LMMA Network at info@LMMANetwork.org.