Lessons for co-management

Experiences from the Fisheries Management Science Programme (FMSP)







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Three examples of FMSP projects

Participatory Fisheries Stock Assessment

ParFish is an approach to fisheries stock assessment that can incorporate local knowledge and fisher objectives the assessment and involve them in data collection and management planning. The approach emphasises feed-back of the assessment results to provide the basis for collective management decisions. ParFish can provide a relatively rapid assessment in data poor situations where other, more traditional, approaches cannot be used.

Adaptive Learning

The FMSP research in this area has led to a tested framework for implementing adaptive comanagement. It is a process orientated approach that makes learning about the socio-ecological fishery system and its dynamics an important function of management. The approach seeks to involve stakeholders in collaborative research and management that will provide benefits and, at the same time, generate information and build capacity that will allow them to adapt management to better meet their needs in the future.

Data collection for co-management

The guidelines and field guides provide tools and advice for developing data collection systems. There is an emphasis on promoting sharing between stakeholders and ensuring the relevance of data to fisheries management or policy formation. The guidelines provide examples of the issues that need to be considered when collecting data (indicators, data types, data sources, accuracy) and identify an eight-stage process for increasing stakeholder involvement and creating effective communications channels for sharing data and information.

Aim of this document:

The aim of this document is to communicate lessons for fisheries co-management that have emerged from a series of projects undertaken by the DFID Fisheries Management Science Programme (FMSP). It focuses on three examples of FMSP projects: ParFish, Adaptive learning and designing data collection systems.

This document does not aim to give a comprehensive overview of co-management but seeks to provide a viewpoint based on the experiences of the FMSP projects in question.

Target of this document:

This document is targeted to fisheries decision makers, managers and facilitators including government, industry and non-governmental organisations.

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The Fisheries Management Science Programme (FMSP) is one of ten research programmes funded by the UK Department for International Development (DFID) through the Renewable Natural Resources Research Strategy (RNRRS). The FMSP has been in existence for eleven years and during this time it has commissioned over 50 individual research projects addressing issues in the management of marine and inland as well as capture and enhancement fisheries in developing countries. These projects have provided a wide range of approaches, tools and information relevant and accessible to policy makers and managers in these countries. For more information, see the web-link below.

Introduction: Fisheries co-management

Mall-scale fisheries dominate the fisheries sectors in tropical developing countries, and provide full and part-time employment as well as safety nets for the rural and urban poor. They also contribute to cash-based economies at the local scale and to national revenue through taxes and exports.

While important for the many types of benefits they provide, it is also recognised that small-scale fisheries are dynamic socio-ecological systems characterised by diversity and complexity in their biological, technical and human aspects. Management of small-scale fisheries is complicated by these different aspects, their interactions and the multiple scales involved.

Centralised arrangements have not been able to meet the challenges of managing small-scale fisheries, as management advice is often detached from those dependent on the resource, and frequently narrowly focused on sustainability of the resource rather than wider objectives such as the improvement of local livelihoods (World Bank, 2004). At the same time, centralised management agencies often lack the resources to enforce decisions that have been taken centrally. Together this produces management that fails to meet the needs of those dependent on the resource and fails to result in sustainable fisheries.

The failure of centralised arrangements for small-scale fisheries has increased the interest in the potential of fisheries co-management (e.g. Pomeroy *et al.*, 2001). Co-management represents the sharing of responsibility for management between resource users, other stakeholders and government.

Co-management arrangements occur in a variety of forms depending on the extent of the shared of responsibility and authority. The exact nature of the arrangement will depend on the local context, and even then is likely to change over time. Further to the discussions on the definition, there are on-going debates as to whether all forms of co-management are effective without a real sharing of decision-making power (World Fish, 2005).

Co-management arrangements may be developed for a number of reasons. These include the recognised failure of centralised arrangements and economically driven reforms and constraints. There is also the recognition that those dependent on the resource have considerable knowledge about the fishery and incorporating their needs and objectives into management can lead to improved decision-making. In addition it is argued that participation in management by those who are subject to regulation can improve compliance to regulations (Kaplan and McCay, 2004), reduce the costs of data collection, monitoring and enforcement, lead to empowerment of local communities (Pomeroy and Berkes, 2004) and assist in conflict management (Noble, 2000).

Developing successful co-management arrangements that provide sustainable fisheries and meet the needs of resource users is a challenge. This brief seeks to highlight some of these challenges, and how research through the DFID Fisheries Management Science Programme (FMSP) has sought to address these.

The FMSP projects highlighted in the brief, Adaptive Learning approach; Data collection for comanagement and ParFish (Participatory Fisheries Stock Assessment), have focused on constraints to developing, implementing and evaluating local management plans. The projects have developed approaches, tools and methods to assist those interested or involved in fisheries co-management.



Fisheries co-management can seek to involve all relevant stakeholders, including traders. Photo: Suzannah Walmsley.

Challenges for successful co-management

A chieving success in co-management requires addressing a number of challenges. Some of these challenges cover constraints in understanding the resource at the local level and agreeing management decisions. Other challenges are related to provision of an enabling policy framework or implementation at a national and regional level.

Research under FMSP has focused on the challenges primarily at the local level including:

• Achieving a shared knowledge base on the resource between resources users, scientists and government agencies.

Often resource users, scientists and government agencies have different perspectives on the resource system and different knowledge. The lack of a shared starting point can create barriers to identifying and achieving management objectives. Resource users often have a wealth of knowledge on the resource (e.g. spawning areas and patterns of gear use in the fishery) and about the needs and objectives of those dependent upon the fishery which can be of great value for management.

 Linking knowledge on the resource to management decisions.

Learning or research on a resource base is often undertaken without direct links to management or policy making. Information collected may not address management objectives. It therefore cannot be used to assess whether objectives have been met, or what actions need to be taken. Research undertaken by external researchers may provide valid information on the resource but it will fail to guide management or policy if it is not available to, or accepted by, policy makers or resource users.

 Broadening the focus of fisheries management to cover social and institutional issues as well as biological aspects.

For co-management to achieve objectives such as increased sustainability of fisheries and enhance livelihoods of resource users, there is a need to understand social and institutional issues of the system as well as the biological aspects of the resource. It is important to understand the underlying drivers behind resource users' behaviour and the institutional constraints that may prevent an equitable or sustainable use of the resource. • Ensuring meaningful participation in the management process.

Both the type of participation (consultative, collaborative or informative) and the level of (individual participation participation or representation) will depend upon a number of factors. These factors include the scale of the resource system, the available capacity and financial resources and the administrative level at which these together with existing institutional exist, arrangements. The challenges here are to ensure that stakeholder groups are identified and involved or legitimately represented. There is also a need for commitment in providing resources to support participation, develop capacity and empower these groups.

ome of the wider challenges that have not been directly addressed through FMSP projects (but which are also crucial) include the need to establish an enabling policy environment and legal empowerment for shared decision-making, and the need to reduce the vulnerability and poverty within fishing communities.

• Creating an enabling environment through policies and legislation.

There is a need for a legislative framework that supports co-management, and within which local rule-making can occur with the full backing of the law. This should include support for monitoring and enforcement. The challenge is to develop and implement legislation that supports devolved management, ensures compatibility of local plans with sectoral objectives and national and international requirements, and through which training, communication, conflict resolution and extension services are provided and/or supported.

• Reducing the vulnerability of fishing communities

The success of co-management rests on the basis that resource users have an incentive to ensure the sustainability of the resources upon which they depend. However this depends on whether they perceive the future state of the resource as a key threat to their livelihoods and whether they are willing or able to take part in management. In many cases it may be necessary to address poverty, vulnerability and marginalisation of resource users before they can effectively engage in comanagement (SFLP, 2005).

Principles applied through FMSP research

he FMSP has commissioned projects to address some of the challenges that face co-managed fisheries. The projects have generated new knowledge, developed and tested approaches, methods and applied certain principles for improving the planning and implementation of co-management.

The principles listed below have applied within FMSP research. They are drawn from a growing understanding of the conditions required for successful co-management (e.g. World Bank, 2005; Pomeroy *et al.*, 2001; Nielsen *et al.*, 2004), and focus primarily on addressing local management planning, implementation and evaluation constraints rather than institutional and policy issues.

- Stakeholder involvement: Involving stakeholders in setting management objectives, data collection, evaluation of plans and decision making.
- Effective communication: Ensuring effective information flows between stakeholders as a basis for learning, coordination and consensus on decisions.
- Using local knowledge: Forming agreement on the state of the resource and allowing the use of local knowledge supports a shared understanding of the resource and greater agreement on management options.
- Adaptive: Recognising that learning and management cannot determine optimal outcomes at the outset but will need to adapt and change as new information is obtained.
- Appropriate: Ensuring that learning and research is relevant to stakeholders and resource users and the outcomes are of direct use to resource users and management of the resource.
- **Empowering:** Commitment to empowering stakeholders through 'training and explaining', and ensuring that stakeholders have sufficient understanding to contribute to the learning process and management decisions.
- Integrated: Recognising that managing resources is not only about the biology of the stock but requires and understanding of social and institutional aspects of the system.

Features of good practice in co-management (World Bank, 2005)

- A government policy establishing a co-management regime
- Clearly defined and legal stakeholders rights to manage
- Constant attention to the composition of the stakeholder group to ensure social equity outcomes
- Adequate monitoring and enforcement rules
- Widespread communications of the co-management partnership and the new management rules.
- Significant initial education and assistance to communities and stakeholders
- Adequate provision and sharing of information and technical assistance to stakeholders
- Broad publication of the rules that have been formulated

Conditions affecting the success of fisheries co-management (Pomeroy *et al.*, 2001)

Government level

- ✓ Enabling policies and legislation
- ✓ External agents

Individual and household level

✓ Incentives

Community level

- ✓ Appropriate scale and defined boundaries
- ✓ Clearly defined membership
- ✓ Group homogeneity
- ✓ Participation by those affected
- ✓ Leadership
- Empowerment, capacity building and social preparation
- ✓ Community organisations
- ✓ Long-term support from government
- ✓ Property rights over the resource
- ✓ Adequate financial resources
- ✓ Partnerships
- ✓ Accountability
- ✓ Conflict management
- ✓ Clear objectives
- ✓ Management rules enforced

Issues to consider for successful comanagement institutions (Neilsen *et al.*, 2004)

- 1. Empowering communities to help define management objectives
- 2. Integrating local knowledge in co-management decision making
- 3. Appreciation for the role of co-management in managing conflicts over fisheries resources

Putting principles into practice



hroughout the implementation of the FMSP programme there has been the opportunity to put identified principles for co-management into practice. A variety of case studies are provided here as examples from the three highlighted FMSP projects: Adaptive Learning; Data Collection for co-management and ParFish.

Adaptive Learning in Lao PDR

The approach

This is an approach to learning that recognises that the most effective way of improving management of a resource is to make 'learning an objective of doing'. Involving stakeholders dependent upon the resource in collaborative experiments using management actions as a means to learn more about the resource system in order to improve management in the future.

The approach recognises the importance of establishing links and channels between stakeholders, as information only becomes useful when it is communicated to those who can act on it. The approach seeks to maximise consensus and manage conflicts through sharing decisions on setting objectives and management measures.

Applied principles

Stakeholder involvement	\checkmark
Promotes communication	\checkmark
Adaptive	\checkmark
Appropriate	\checkmark
Empowering	\checkmark
Comprehensive approach	\checkmark

In practice in Southern Lao PDR

The approach was applied in small water bodies in southern Lao PDR. Many water bodies in the area are managed as 'community fisheries', providing a vital source of income for villages and also food for poorer families in times of stress (e.g. funerals). However villages are uncertain as to the best stocking strategies for their water bodies and, being isolated, opportunities for shared learning is restricted. On the other hand the government is unsure as to what advice to give to villages.

The adaptive learning process provided an opportunity to develop a working relationship between villages, researchers and fisheries governmental staff in order to address some of these uncertainties and to generate and share

information that could lead to real improvements in village managed water bodies.

Discussions were held with village representatives, provincial and district fisheries staff to determine the current resource outcomes and management uncertainties. Tools were used to consider both the institutional and biological aspects of the resource and how they interact. Constraints to learning were also identified and channels for information sharing between stakeholders identified.

A shared learning strategy was developed. This involved a process where stakeholders from 38 villages were involved in identifying the key constraints in managing their fishing ponds and their priority research questions. A series of 'passive' and 'active' experiments were set up based on different management regimes and differences in fish stocking. This required considerable discussion and flexibility to ensure that the plan was acceptable. 'Contracts' between stakeholder groups were established that clearly specified their roles in the learning exercise to ensure transparency and accountability.

The results of the experiments determined the most effective mixes of fish species to improve production and village incomes. Involving resource users in the learning from the beginning developed their skills and knowledge, made the research more relevant. It also meant they were better able to make use of the results and apply the recommendations resulting in real and tangible benefits to households in participating villages.



Improving information for management decision-making through collaborative management experiments. Photo: Simon Bush.

Putting principles into practice

Co-design of data collection systems in Thailand

The approach

A set of guidelines for data collection have been published through FAO. These provide advice on developing data collection systems and promoting information sharing to ensure relevance of data to fisheries management and to policy formation.

Principles applied

Stakeholder involvement	
Promotes communication	
Appropriate	
Empowering	
Integrated approach	

In practice in Thailand

A participatory review of data collection systems for the Huay Luang reservoir in Thailand revealed that there was a lack information on fish catch, illegal fishing, and the conditions of the reservoir. This was required to take management decisions and plan for the sustainability of the fishery. Local stakeholders including the fisheries department, resource users and wider stakeholder groups were aware that they needed a robust annual monitoring programme that would tell them of the key problems, how to address them and whether the community management approach was providing long-term benefits.

A stakeholder analysis revealed over 30 groups affected by or interested in the state of the reservoir. Their involvement in the design of a new data collection programme ensured that the issues



Fisher groups were keen to understand the sampling methods. Photo: Wolf Hartmann.



Stocking at Huay Luang reservoir. Photo: Wolf Hartmann.

covered were not solely focused on fisheries but also concerned environmental and social issues.

Using the eight-stage process recommended in the FAO Guidelines, stakeholders were able to identify information requirements and agree a data collection programme. Rather than only being involved in collecting the data, resource users were actively involved in deciding what data needed to be collected and why. Involving stakeholders at the design phase ensured that appropriate indicators were selected that could measure changes in the fishery and successes or problems with management.

The stakeholders also identified where information needs were shared by more than one group and how responsibilities for data collection and analysis could therefore also be shared. It was also an opportunity to test data collection forms and revise them so that they were easy and quick to fill in. Ten villages volunteered to collect data and pass this on to the fisheries analysis office, based on the understanding that the fisheries office would feed back the information on a regular basis.

Given the success of the planning exercise there are high expectations that the monitoring programme will prove to be sustainable and that information on trends and impacts of management will be passed on to stakeholders to inform their decision-making. A key challenge will be to maintain the incentives for on-going data collection and ensure that the identified communications channels are used to provide feed-back and data and information flow between stakeholders.

Putting principles into practice

parfish

Participatory Fisheries Stock Assessment (ParFish) in Kizimkazi, Zanzibar

The approach

ParFish is a promising approach to enable the rigorous use of local knowledge in combination with data collected from other sources such as catcheffort or fishing experiment data. The ParFish approach encourages stock assessments to be related to management decisions and can help to ensure that management decisions take account of fisher objectives

Principles applied

\checkmark
\checkmark

In practice

ParFish was applied to a multi-species fishery in the waters off the Kizimkazi village of Zanzibar. Fishers



Application of ParFish in Zanzibar showed how fishers can contribute to stock assessments. Photo: Suzannah Walmsley.



Recording fish catches from the Kizimkazi reef fishery as part of the assessment process. Photo: Paul Medley.

from nearby villages use hand lines, traps, and some nets to fish on the fringing and patch coral reefs.

A key principle of ParFish is to involve all relevant stakeholders from the beginning of the assessment and data collection. This can help to achieve consensus and acceptance of the results. In Zanzibar the process began by engaging with the fishers and understanding the broad context of the fishery. Fishers were involved in collecting data on the fishery. They participated in interviews to share local knowledge of the resource and to give their preferences for different catch rates.

The results from the stock assessment were discussed in a multi-stakeholder workshop where there was an opportunity to understand how the assessment had worked. The process helped to establish a relationship of trust between the fishers and scientists. All stakeholders agreed with the results that fishing effort needed to be reduced by 10-15% and management options were put forward on steps to achieve this.

However, the main difficulty now facing the fishery is implementing these management measures. Local communities lack the legal backing and resources to implement measures on their own and there is also the need to manage potential conflicts of interest with migratory net fishers.

Lessons learned

he FMSP projects have focused on the constraints faced in planning, implementing and monitoring local co-management plans. The projects have developed a range of tools and approaches such as the adaptive learning approach, data collection for co-management and ParFish and provided guidance on their application.

Benefits

The use of the approaches and tools developed have provided a number of important benefits including:

- ✓ Improved management planning: combining local and scientific knowledge to provide a common understanding enabled researchers and fishers in West Bengal to identify management practices that could increase yields by 15% and incomes by 11% at little or no additional cost.
- ✓ Improved information for management: involving data collectors in the design, planning and evaluation of data collection systems helped improve data quality in Lao PDR.
- ✓ Improved decision making: feedback from a ParFish assessment in Andhra Pradesh, India provided a forum for open communication between stakeholders and agreement on future priorities and actions.
- ✓ Improved management capacity: the adaptive learning approach includes a commitment to developing stakeholder skills and knowledge. In both West Bengal, India and Lao PDR, participant evaluations suggested significant and real improvements in both knowledge and skills in a range of relevant categories.

Achieving the benefits in practice

A number of the tools and approaches that have been developed, together with FMSP project experiences, have been synthesised and made available through a short, accessible document on co-management (Arthur, 2005).

At the heart of co-management lies shared decision making and for this decision making to be well informed there is a need to ensure that all stakeholders have access to relevant information in a useable form. This includes local knowledge and information on social, economic and biological aspects. A comprehensive understanding of the fishery provides a better basis for decision-making.

Experiences from the FMSP have also illustrated that co-management arrangements are context specific. The tools, performance indicators and management actions required will differ between fisheries and even within fisheries over time. Co-management arrangements therefore need to be both flexible and adaptive. They need to be able both to modify plans during implementation and to learn from management outcomes.

The final lesson, and perhaps the most important, is that whatever the context, the actual tool or method that is used is less important than **how** they are used. A real commitment to identifying and building on existing strengths, transparency, equitable distribution of benefits, active participation and to creating shared authority as well as shared responsibility remain the most important aspects in any co-management initiative.



Women fishers at a village 'fishing day' in southern Lao PDR. Photo: Simon Bush.

Wider lessons for co-management

The FMSP projects have generally focused on achieving shared understanding and supporting for local management planning. However there are also lessons that reinforce some of the wider principles for successful co-management.

• There needs to be a supportive legal framework for co-management to be implemented.

Although it is possible to achieve progress in understanding the fishery, agreeing management objectives and improving communication flows, this is less likely to be sustained or translated into management actions if there is no supporting legal framework. Appling the management actions identified in Zanzibar through the ParFish approach will require a legal framework within which local stakeholders can legitimately act.

• It is important that decision-making associated with management planning occurs at a scale that matches the scale of the resource and the resource users.

Determining the most appropriate scale for decisionmaking is complex with fishers involved in both part time and full time work. There is also the issue of migratory fishers, who often make use of fisheries resources in certain area and seasons as part of their livelihood strategies. When applying ParFish in Zanzibar, discussions on management objectives for the resource are only addressing part of the issue if migratory fishers from the mainland are not involved.

• Supportive communications networks for shared decision making may require fundamental changes in institutional arrangements.

Changing the way stakeholder groups communicate with each other, or strengthening communications may require changes networks to existing arrangements. It may be important to develop forums to share information horizontally as well as allowing for feedback both up and down stakeholder levels. In applying the adaptive learning approach in Lao PDR the most desirable networks were found to be non-hierarchical structures. These enabled communication between villages and between government departments at the district and government level. This required organisational changes to provide the resources and create the forums for this communication to take place.

• Although resource users may be aware of the 'optimal' management strategies, they may be



Reaping the rewards: increased yields from management experiments in rice-fish systems in West Bengal. Photo: P.K. Pandit

unable or unwilling to implement these because of wider constraints.

The lack of resources or power to enforce management rules, such as closed areas, can make resource users reluctant to support them. Underlying vulnerabilities such as a reliance on the resource for income may also be a constraint that reduces the ability to engage in learning or support management measures that reduce access to the resource. The lack of enforcement is a key constraint in Zanzibar for implementing management actions. In India the use of adaptive learning revealed that the information provided to resource users was based on erroneous assumptions about user objectives. This meant that the information, while correct, was not relevant to their circumstances. Gaining an understanding of user opportunities and constraints is therefore vital if useful practical support is to be provided.

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Further information

his document is based on experiences from three projects undertaken within the Fisheries Management Science Programme (FMSP) supported by the UK Department for International Development (DFID), and managed by Marine Resources Assessment Group.

Further information on these projects and a number of other projects related to research to improve the livelihoods of the poor reliant on fisheries resources can be accessed from the FMSP website. Alternatively it is possible to contact MRAG for copies of any of the reports related to these projects.

Website Address

www.fmsp.org.uk

Contact Details

 Marine
 Resources
 Assessment
 Group

 Email:
 enquiry@mrag.co.uk

 Tel:
 +44 (0) 20 7255 7755

 Fax:
 +44 (0) 20 7499 5388

Related Documents

A series of related documents are available that provide additional information on experiences, tools and approaches relevant to co-management. All of these are available from the FMSP website. This document is an overarching brief that provides an introduction to the projects and their relevance to co-management. Further to this there is the more detailed synthesis of co-management lessons learned that partners this document. Both of these draw upon a range of information including the four synthesis documents that take some of the issues raised here into further detail. In addition to these are guidelines and reports available on the FMSP website (and referred to in the synthesis documents) that provide further, more technical detail. This is described in the diagram below.



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