

## COMMUNITY-BASED MARINE RESOURCE MANAGEMENT: A CASE STUDY IN THE TROBRIAND ISLANDS, PAPUA NEW GUINEA

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### ABSTRACT

This paper describes a community-based management methodology that was used to promote the sustainable management of marine resources, especially sea cucumbers, within a village in the Trobriand Islands, Milne Bay Province, Papua New Guinea. While recognising traditional and customary knowledge and systems, the methodology encouraged increased participation of resource users in decision-making. This was achieved by empowering community members to assess the awareness of their problems and to develop a plan to solve these problems. The community developed a marine resource management plan that included conservation and development objectives, and associated actions, to achieve the sustainable use of their marine resources. The community-based management methodology was successful in mobilising the community to take some actions to conserve their surrounding marine habitats and resources. As in other uses of this management approach, it is clear that certain conditions need to be met in order to increase the chances of developing and sustaining successful community-based marine resource management arrangements in the Trobriand Islands in the future.

**Keywords:** Community-based management, *bêche-de-mer*, sustainability, Trobriand Islands, Papua New Guinea

### INTRODUCTION

In 2001, the *bêche-de-mer* (sea cucumber) fishery in Milne Bay Province, Papua New Guinea produced approximately 209 mt. (dry weight) that was worth over 8 million kina (or approximately US\$ 2 million) [1]. This fishery provides one of the main sources of income for coastal villagers in Milne Bay Province [2]. There are over fifteen different species of sea cucumbers that are harvested by local fishers in Milne Bay Province, but the high-value species such as sandfish (*Holothuria scabra*), are generally targeted. However, in recent years, some of the low-value species, such as blackfish (*Actinopyga miliaris*) and curryfish (*Stichopus hermanni*), are now making a greater contribution to the overall catch [2].

Under Section 28 of the *Fisheries Management Act 1998*, the National Fisheries Authority established the Papua New Guinea National *Bêche-de-mer* Fishery Management Plan 2001 (FMP). The objectives of the FMP are to: (a) manage the fishery so that Papua New Guinea gains the maximum economic benefits; (b) ensure that the development of the *bêche-de-mer* fishery benefits coastal communities, particularly customary fishers; and (c) to ensure use of the *bêche-de-mer* resource is sustainable and that *bêche-de-mer* fishing has minimal impact on the marine and coastal environment. Management measures that have been established to meet these objectives include licensing, catch limits, gear restrictions, and seasonal closures of the fishery. However, in a survey undertaken in 2001, it was concluded that a number of sea cucumber species were grossly over exploited and further management measures needed to be implemented immediately [1].

This recommendation offers the opportunity to search for alternative approaches for the sustainable management of the *bêche-de-mer* fishery in Milne Bay Province. The signing of a Memorandum of Understanding between the Australian Maritime College/National Research Institute of Papua New Guinea and the Kiriwina and Goodenough Local Level Government took place in June 2001 to initiate a

project to investigate an approach that would allow village communities to establish and implement their own management controls within appropriate sustainability criteria. The primary project objective was to develop a methodological approach that would produce community-based management arrangements to achieve sustainable artisanal fisheries in Papua New Guinea. The approach needed to provide for the community and, at the same time, be acceptable to the appropriate levels of Government. Although the primary focus of the project was *bêche-de-mer*, the community-based management arrangements had to be inclusive of other living marine resources.

The community selected to undertake the project was Obulaku village on Kiriwina Island in the Trobriand Islands. The Trobriand Islands are located off the eastern coast of Papua New Guinea in Milne Bay Province. The group consists of twenty-one low lying coral and sand islands and four main islands; Kiriwina, Kaileuna, Kitava and Vakuta (Fig. 1). Kiriwina is the largest and most populated of these islands.

Obulaku village consists of 62 households, with a total of population of 298. The village contained six separate clans. Most people only spoke the local language *Kilivila* with a few speaking English or Pijen.

For most villages on Kiriwina, including Obulaku, a local processor purchases the majority of the live sandfish directly from the harvesters. The majority of the other species of sea cucumber are processed by the harvesters and purchased by the local buyer in Losuia. The buyer rejects any *bêche-de-mer* which are under-sized and pays a lower price for any product that has not been processed properly. Poor quality product is generally re-processed by the buyer.

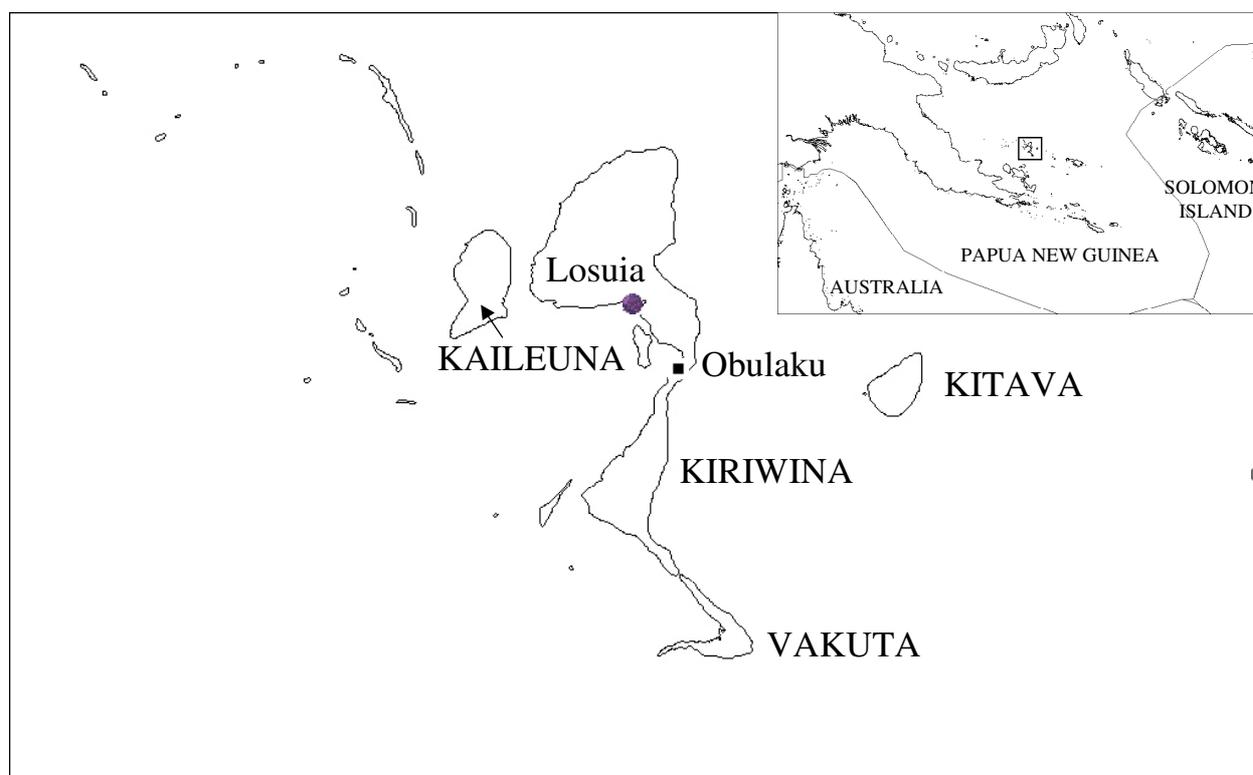


Figure 1: Map of the Trobriand Islands showing the project location at Obulaku, Kiriwina

## COMMUNITY-BASED MANAGEMENT METHODOLOGY

'Community-based fisheries management is used to refer to the comanagement arrangement whereby villages or other communal groupings are the primary partners and principal initiators of management action for the inshore fisheries in a specified locality' [3, p.2]. Following this definition, a facilitation team, which consisted of two recent graduates trained in socio-economics and fisheries management, helped the community work through the approach to establish a community-based fisheries management arrangement. The approach taken at Obulaku was based on the Facilitated Community Action Process (FCAP) that had been used in a three year AusAID project in Samoa [4]. A detailed description of the methods incorporated into the FCAP process is given in [4,5,6].

A brief description of the key stages of the FCAP process and the associated activities in Obulaku are outlined below:

- Establishing the willingness of the community to participate in the process by assessing their awareness of problems and by developing an agreed plan to solve these problems. This was achieved at two meetings held in September 2001 with key members of the community, local-level government officers and the project staff.
- Gaining knowledge of the activities within the community and identifying appropriate people to work with in the community. This stage included interviews with the traditional leaders and other key people in the community. The leaders requested that the facilitation team work directly with the individual clans. Separate meetings with each of the six clan leaders were held to gain their support and to encourage them to involve all their clan members in the process.
- Promoting participation with the clan members was achieved by asking them to identify pictures of key marine species and to provide the local name. Discussion was promoted by showing scenes of a 'healthy' and 'unhealthy' marine environment that were depicted in two separate posters. This discussion provided an introduction into generating awareness about fisheries management issues. This awareness generated concerns within the community about their present situation.
- Educating community members about different fisheries management approaches and promoting an awareness of actions that can be taken to improve the situation.
- Identifying problems that the community is facing and the effects that each problem is having on their lives. The key problems identified were: (a) not enough money, (b) fewer and smaller fish, crabs, shells and *bêche-de-mer*, (c) unable to process *bêche-de-mer*, (d) no canoes, and (e) transport to Losuia (the main market) difficult. For each problem, causes and solutions were discussed and actions required to alleviate the problem were identified. The facilitation team empowered the community members to generate their own ideas, solutions and actions.
- Generating 'problem and solution trees' for the whole village. The problem and solution tree for fewer and smaller fish, crabs, shells and *bêche-de-mer* is shown in Figure 2. Included in the 'problem and solution' trees were the actions identified for alleviating each key problem. For fewer and smaller fish, crabs, shells and *bêche-de-mer*, the actions included a set of precautionary measures to improve the marine environment e.g. size limits, bans on the use of destructive harvesting techniques and the dumping of rubbish in the marine area.
- Identifying people who would be responsible for undertaking the actions. The community identified that they needed to form their own fisheries management committee to coordinate these activities. During the initial meetings, the committee allocated responsibilities to different members and agreed that they needed to: (a) establish a monitoring program to evaluate the effectiveness of their actions and (b) prepare a village management plan for sustainable marine resource use. The project team assisted the community to develop a draft management plan and to collect baseline data through surveys and monitoring programs.

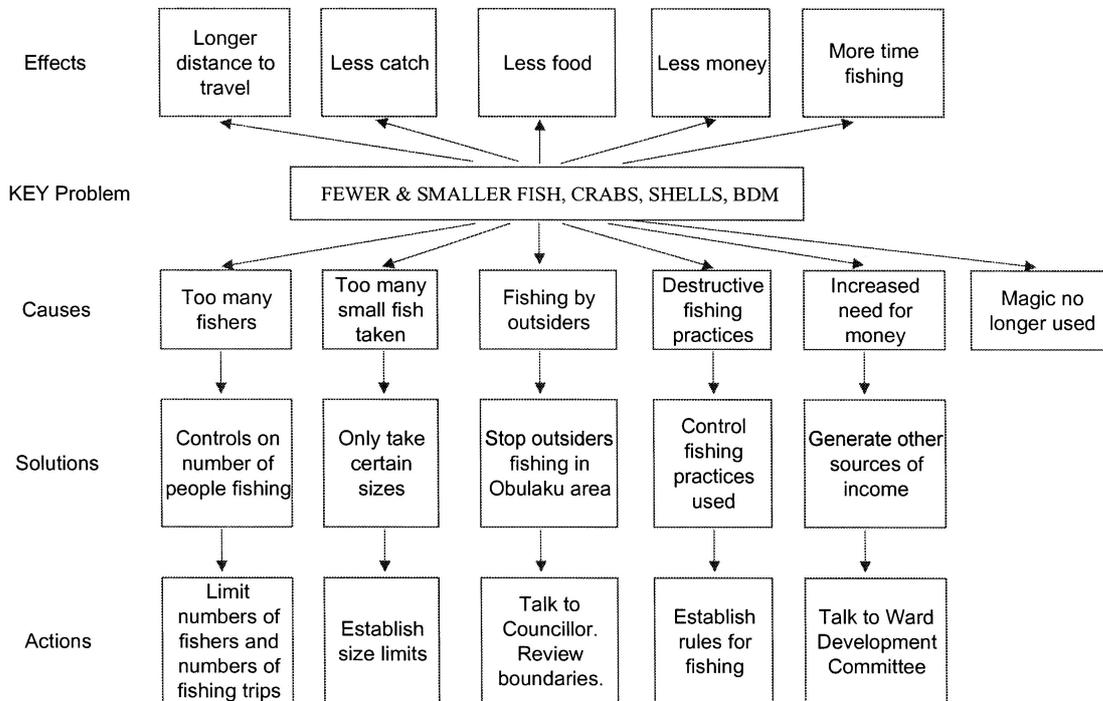


Figure 2: Problem and solution tree for the key problem of fewer and smaller fish, crabs, shells and *bêche-de-mer* (BDM)

### Community-based marine resource management plan

The collected information was used to produce a management plan for the sustainable use of marine resources, including *bêche-de-mer*, for Obulaku village. The key components of the management plan were a set of conservation (see Table I) and development (see Table II) objectives that the community developed to address their key problems. As the range of problems was broader than just fisheries concerns these objectives reflect issues that impact on the overall well-being of the community.

Table I: Conservation Objectives

Conservation Objectives	Actions
To keep the lagoon/sea adjacent to the village clean	Yes
To keep the village clean	Yes
To control the types and sizes of fishing gear used in the Obulaku Marine Area	Yes
To ensure some <i>bêche-de-mer</i> species meet minimum size limits	Yes
To control numbers of people fishing and the number of fishing trips	No
To limit the number of outsiders who harvest resources from the Obulaku Marine Area	No
To reduce the removal of mangroves	Yes
To minimize impacts on the reefs	Yes

**Note:** Actions refer to the activities that had been undertaken in an attempt to meet each objective

Table II: Development objectives

Development Objectives	Actions
To obtain equipment needed to process <i>bêche-de-mer</i>	Yes
To organize regular transport to Losuia	No
To increase number of canoes available in the village	Yes
To consult appropriate levels of government departments and non-governmental organizations (NGOs) to assist with the sustainable development of fisheries in Obulaku Marine Area	No
To identify alternative sources of income	No
To establish an aid-post in the village	Yes
To establish a water supply in the village	Yes
To purchase a community dinghy	No

**Note:** Actions refer to the activities that had been undertaken in an attempt to meet each objective

### Outcomes of the Community-Based Marine Resource Management Arrangement

A review of the progress that had been made by the community to meet their management objectives was undertaken approximately one year after the management plan had been completed. This review included the identification of actions that had been taken by the community to meet each objective.

For some of the objectives there had been no action taken or no attempts made to meet the objective (see Tables I and II for 'No'). Although none of the objectives had been met completely, the community had certainly undertaken some activity and was trying to implement their management plan. With most relevance to the *bêche-de-mer* fishery, the community had established size limits for some of the most important species. This not only encouraged responsible harvesting but had some other benefits to the community. Due to the larger sizes harvested, the price paid for a single sandfish landed by fishers from Obulaku was significantly higher than those harvested from other villages. The number of sandfish that were rejected by the buyer from Obulaku harvesters was also significantly lower than the numbers harvested from other villages. These positive outcomes are considered to be directly related the community-based management approach that was undertaken in the village of Obulaku. However, the failure to take agreed actions definitely undermines the overall success of the community-based management approach undertaken in Obulaku.

## CONCLUDING COMMENTS

An attempt has been made to examine the underlying reasons for the limited success of the adopted approach. Berkes *et al.* [7] identified preferred conditions for the successful co-management and community-based management from cases around the world. These conditions are identified at three levels: at the supracommunity level, which are conditions that are external to the community and include government, legislation and markets; at the community level, which are the conditions that impact on the whole community and include the physical and social environment; and at the individual level, which are the conditions that impact on individual community members [7].

A comparison of these conditions with the situation in Obulaku, as provided in Table III, should provide an indication of the potential reasons for the limited success of community-based management arrangement.

**Table III: Presence of preferred conditions for successful fisheries community-based management arrangements in Obulaku**

<b>Preferred conditions for successful fisheries community-based management arrangements</b>	<b>Presence</b>
<b>At the supracommunity level</b>	
Legal right to organize	<b>No</b>
External agents	<b>Partial</b>
<b>At the community level</b>	
Clearly defined boundaries	<b>No</b>
Clearly defined membership	<b>Partial</b>
Group cohesion	<b>Partial</b>
Participation by those affected	<b>Partial</b>
Cooperation and leadership at community level	<b>Partial</b>
Leadership	<b>Partial</b>
Empowerment	<b>Partial</b>
Property rights over the resource	<b>No</b>
Appropriate local organizations	<b>Partial</b>
Adequate financial resources	<b>No</b>
Partnerships/partner sense of ownership of the comanagement process	<b>Partial</b>
Accountability and transparency	<b>Partial</b>
Strong comanagement institution	<b>Partial</b>
<b>At the individual level</b>	
Individual incentive structure	<b>No</b>
Credible rules and effective enforcement	<b>Partial</b>

Note 1: Preferred conditions listed in Table III are taken from [7].

Note 2: Presence refers to conditions that were considered to partially exist (Partial) or not exist (No) in the project at Obulaku. Some of these judgments are subjective in nature, and it was not considered possible to conclusively determine the presence of any of the preferred conditions

The interpretation of the key conditions at each level stated in Table III are given below as examples of conditions that were considered not to exist:

*Legal right to organize:* although under section 42 of the Organic Law on Provincial Governments and Local-Level Governments 1995, the local level government and the provincial legislature retains law-making powers over a large number of issues including 42(t) renewable and non-renewable natural

resources, there is uncertainty over the legal recognition of the community-based management plan that was established in Obulaku.

*Clearly defined boundaries:* community-based management requires communities to take responsibility for the management of the marine resources within a particular area. For communities to commit to the process there needs to be a clear definition of the boundaries of the 'management area' that a community will be responsible for. However, even though the Obulaku community could clearly identify the boundaries of their traditional area, it was not possible to get an agreement on these boundaries with other parties. Marine boundary issues are always likely to be contentious and may be a major impediment for establishing community-based marine management arrangements in this region.

*Adequate financial resources:* support will need to be provided to communities if the process of community-based management is to be successful. The costs and benefits of the approach need to be carefully considered. Government authorities will need to make a firm decision whether to move in this direction. Some considerations, which will have resource implications, would include:

- The community-based management process within a community may take years before an effective outcome is reached.
- Regular follow-up with the communities would be required to ensure continued management of the resources by the community. This support needs to be given to the community by appropriately trained staff from within government departments or NGOs. Community committees and members will need to be encouraged, on a regular basis, to continue the community-based management process. This would need to be resourced appropriately and built into the regular work program of the responsible department or organisation.
- The number and expertise of facilitators required in a community team.

*Individual incentive structure:* there needs to be an incentive system to keep individuals involved in the community-based management process. Any incentive system will add costs to the process, however this needs to be considered carefully, as it is strongly considered that without one it may be difficult to achieve a successful outcome. The long-term benefits that may accrue from establishing sustainable fisheries may not be a sufficient incentive to keep community members interested in the process. Addressing some of the 'other' more immediate problems identified by the community during the initial stages of the process may provide an appropriate incentive.

The whole process of community-based management revolves around the community identifying problems and then generating their own solutions. Many problems that the community faces are not purely fisheries related. They have other important socio-economic issues that need to be considered. If these issues are not dealt with at the same time as the fisheries issues the effectiveness of the community-based management approach will be compromised. The team of facilitators that work with the community need a much broader background than purely fisheries.

The adoption of a Sustainable Livelihoods Approach [8] which is being used in West Africa to link fisheries policy with the need for the reduction of poverty in fishing communities could be considered as one of the means to improve the overall success of the community-based management approach that was trialed in the Trobriand Islands.

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