Vanuatu and the locations (red dots) where surveys took place.

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A baseline survey of coastal villages in Vanuatu

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1. Introduction

The baseline survey that forms the focus of this study was done for the "Project for Promotion of Grace of the Seas for Coastal Villages in Vanuatu, Phase 2". Supported financially by the Japan International Cooperation Agency and coordinated locally by the Vanuatu Fisheries Department (VFD), the project will last 34 months, from January 2012 until November 2014. It has two main objectives: 1) to improve the conservation of coastal environments and the sustainable use of coastal resources in selected target areas; and 2) to promote community-based coastal resource management (CBCRM) in rural areas. Both goals will be attained through the provision of technical assistance by VFD.

The project includes several pilot activities that involve the community-based management of fish aggregation devices (FADs). At local workshops, community members learn how to assemble (Photo 1) and deploy FADs in coastal or offshore areas (Photo 2), develop a FAD management guideline, and organise FAD management committees. Another project activity involves the recording and analysing of fishing activities, which helps communities to better understand current catch trends and the economics of the various fishing pursuits. It also helps train community members to analyse their own fishing activities by recording information on data sheets and entering the data into a computer (Photo 3). These activities are aimed at organising local systems of fishing data collection and analysis to provide a foundation for future local CBCRM activities. Shell craft making and marketing is being promoted to enhance community awareness of coastal resources and alternative income sources. The project organises local workshops with women's groups to teach shell craft making and to advise on marketing (Photos 4 and 5). Yet another project activity is modifying the design of local canoes in order to improve access to offshore areas (Photo 6). The model developed to date uses both a sail and an outboard engine (Photo 7), which improves access to offshore resources and reduces fuel expenditures for fishing activities. To generate alternative income sources, the project also promotes giant clam culture by local communities. The project provided juvenile giant clams (*Tridacna maxima* and *T. squamosa*) and culture cages to Moso Island in northern Efate (Photo 8). The project has also released trochus and green snails in the coastal waters of Uripiv Island near Malekula, and, with local communities, regularly monitors the propagation conditions of released shellfish (Photo 9).

In Vanuatu, as in most other developing countries, statistical data and other published and unpublished sources of information required to design and implement development projects (as well as to target specific communities), either do not exist or are of limited usefulness. Inevitably, this requires that comprehensive surveys be conducted to collect basic information essential for understanding conditions and issues. The baseline survey conducted for this project consists of three main components: 1) questionnaire-based surveys, 2) workshops, and 3) a literature review. The information acquired is being used to design and implement the pilot projects. The baseline survey was conducted between May and August 2012, with additional surveys conducted between September and November 2012. This publication reports on the results of the survey to date, although a supplementary survey will be conducted later.

In each target community, three different types of questionnaires were used to interview community representatives, randomly selected households and residents. The principal objective of these interviews was to understand the general characteristics and existing conditions of the communities, particularly regarding fisheries and coastal resource management, as well as to understand community members' perceptions regarding CBCRM. Three types of workshops were conducted. At the community level, workshops covered all target communities and were

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Photo 1. The "Project for Promotion of Grace of the Seas for Coastal Villages in Vanuatu" introduced a fish aggregation device (FAD) that is economical, simple to construct, and easy to deploy.

Photo 2. Fishermen from the local community are trained to construct, deploy and maintain the FAD with the assistance of the Vanuatu Fisheries Department.

Photo 3. A simple and easy-to-use data sheet is introduced to members of the local community.

Photo 4. A man from Mangaliliu on the right demonstrates the production of shell polished products. The income gained through the polishing of shells could help reduce fishing pressure on coastal marine resources.

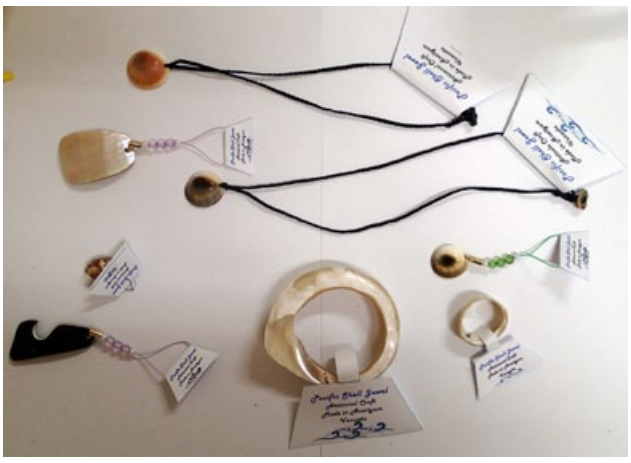

Photo 5. Samples of shell jewellery.

Photo 6. Assisted by the Vanuatu Fisheries Department and a Japanese specialist, local fishermen modify a traditional canoe by equipping it with a sail and small outboard engine. This will help reduce fuel consumption.

Photo 7. Sea trials of the "modified canoe" demonstrated that with a good wind local fishermen do not need to rely on outboard engines.

Photo 8. With assistance from the Vanuatu Fisheries Department, community members rear juvenile giant clams for sale for aquarium use. This is expected to generate an alternative income that could contribute to improving coastal resource management.

Photo 9. Releasing trochus and green snails on the reefs at Uripiv (Malekula). Trochus and green snail numbers were nearly depleted in Malekula. For stock enhancement and awareness-raising purposes, the project released green snails and trochus on the reef in front of the community.

participated in by community representative Chief Councils, marine protected area (MPA) committee members, church group members, and VFD staff. The objective of these workshops was to understand the challenges confronting the target communities and the requirements that must be met to achieve sustainable CBCRM (Photo 10). Similarly, a rapid rural appraisal (RRA) workshop covered all target communities, and was participated in by community representative Chief Councils, MPA committee members, church group members, and VFD staff. The objective of the RRA workshop was to understand the existing use of fisheries resources by communities, and to produce a fishing ground map and a fishing calendar for each site (Photo 11). An institutional development/organisational strengthening (ID/OS) workshop was held with VFD staff and related non-governmental organisations (NGOs) in order to analyse the institutional capability of communities, and identify an appropriate strategy for VFD to promote CBCRM. Finally, a literature review was conducted to complement the information collected through the baseline survey. This review included scientific articles, project (survey) reports, guidelines and manuals related to CBCRM in Pacific Island countries, including Vanuatu.

Photo 10. Facilitated by project team members, in June 2012, villagers of Sunae examine the problems, challenges and counter-measures of marine coastal resource management.

Photo 11. To understand the current level of exploitation of resources, a Japanese specialist confirms the mapped location of coastal fishing grounds with fishermen from Aneityum.

2. Methodology

2.1. Questionnaire-based surveys

Three kinds of questionnaires were used ("Sheet 1", "Sheet 2" and "Sheet 3"; see Appendix 1), depending on the interviewee. Interviews using Sheet 1 were conducted with representatives of all 23 target communities (Table 1). In Vanuatu, a chief is in charge of the administration of each community; therefore, community chiefs were considered the appropriate interviewees for Sheet 1. All chiefs are male (with the exception of Mapest on Malekula), and range in age between 32 and 83.

Table 1. Main characteristics of the three questionnaires.

Title	Target group	Objective	Main topics
Sheet 1	Community representatives	Understand the overall profile of each community	Number of households; population change; basic infrastructure and services; economic activities; community cooperatives and/or associations
Sheet 2	Households	Identify the economic and social structure of households in target communities	Household information includes: • Number of members, ages, occupations, educational levels • Economic activities: monthly income and living cost, fishing activities, fish consumption, social capital
Sheet 3	Community residents	Understand community members' awareness and opinions of, and participation in coastal resource management	Awareness and recognition of fisheries resource condition; compliance with resource management activities, including marine protected area; change in fishing activities; opinions regarding the resource management plans

Sheet 2 (see Table 2) is broken down by the number of households and individuals. On Malekula, some small communities have fewer than 10 households.

Sheet 3 interviewees were asked about their perceptions regarding CBCRM, including their recognition of resource conditions; level of compliance with resource management activities, including MPAs; changes in fishing activities; and opinions about the resource management plans. To avoid bias, interviewees for Sheet 3 included both men and women, and young and old because results were expected to differ significantly according to gender and age. Table 3 shows the numbers of interviewees for Sheet 3 by target community, gender and age group.

All interviewers were selected from among residents of target communities. Project team members gave interviewers detailed instructions on how to conduct interviews, and interviewers underwent a pre-test to ensure that information was collected as instructed. After the project team members confirmed the results of the pre-test, interviewers went ahead and implemented the questionnaire-based surveys in the target communities.

Table 2. Target communities, households and interviewees for Sheet 2.

Province	Island	Target area	Target communities of the survey	Total number of households	No of households covered by Sheet 2	Percentage covered in the community (%)
Tafea	Aneityum	Aneityum	Analcauhat	136	22	16.2
			Umetch	34	8	23.5
			Port Patrick	40	8	20.0
		Subtotal of Aneityum		**210**	**38**	**18.1**
Malampa	Malekula	Crab Bay	Barrick	13	6	46.2
			Bushman Bay	6	5	83.3
			Hatbol	48	6	12.5
			Limap	20	6	30.0
			Lingarakh	52	11	21.2
			Lowni	20	4	20.0
			Lo Sarsar	3	3	100.0
			Mapest	8	5	62.5
			New Bush	7	5	71.4
			Portidur	37	6	16.2
			Teremp	22	5	22.7
			Tevaliant	37	6	16.2
			TFC*	30	4	13.3
			Tembimbi	35	6	17.1
		Subtotal of Crab Bay		**338**	**78**	**23.1**
		Uri	Uri	17	5	29.4
		Uripiv	Uripiv	90	16	17.8
		Subtotal of Uri-Uripiv		**107**	**21**	**19.6**
Shefa	Efate	Mangaliliu	Mangaliliu	70	12	17.1
		Lelepa	Lelepa	100	13	13.0
		Subtotal of Lelepa and Mangaliliu		**170**	**25**	**14.7**
		Moso	Sunae	14	5	35.7
			Tassiriki	63	7	11.1
		Subtotal of Moso		**77**	**12**	**15.6**
Total				**902**	**174**	**19.3**

Source: Project baseline survey

* TFC refers to Terfick Company, although this name is rarely used. Instead, local people refer to the community as TFC.

Table 3. Number of interviewees for Sheet 3 by age group and gender.

Province	Island	Target area	Target communities of the survey	Total number of population	No of population covered by Sheet 3	Male			Female			No answer
						Age group			Age group			
						under 20	20–40	over 40	under 20	20–40	over 40	
Tafea	Aneityum	Aneityum	Analcauhat		51	7	9	10	8	7	10	
			Umetch	915*	15	3	2	4	2	2	2	
			Port Patrick		25	5	4	3	2	4	2	5
		Subtotal of Aneityum (%)			**91 (9.9)**	**15**	**15**	**17**	**12**	**13**	**14**	**5**
Malampa	Malekula	Crab Bay	Barrick	160**	10		4	4			2	
			Bushman Bay	20–30**	10	2	1		3	2	2	
			Hatbol	Over 100**	10			1	1	3	2	3
			Limap	100**	10	1	2	1	2	2		2
			Lingarakh	Over 200**	14		13	1				
			Lowni	60**	8	1	3	2				2
			Lo Sarsar	12**	5	1	2		1	1		
			Mapest	25**	10	2	1	1	1	4		1
			New Bush	25**	10	2	1		2	4	1	
			Portidur	Over 100**	10	4	1		2	2		1
			Teremp	Over 100**	10	2	2	1		3	2	
			Tevaliant	100**	5		3	2				
			TFC	30**	7		4			1	1	1
			Tembimbi	Over 100**	10	1	2		1	1		5
		Subtotal of Crab Bay (%)			**129**	**16**	**39**	**13**	**13**	**23**	**10**	**15**
		Uri	Uri	Over 100**	10		5	1		1		3
		Uripiv	Uripiv	Over 100**	27	2	8	5	7	2		3
		Subtotal of Uri-Uripiv (%)			**37**	**2**	**13**	**6**	**7**	**3**	**0**	**6**
Shefa	Efate	Mangaliliu	Mangaliliu	270*	25	5	6	3	3	4	4	
		Lelepa	Lelepa	387*	38	4	8	2	1	12	11	
		Subtotal of Lelepa & Mangaliliu (%)			**63 (9.6)**	**9**	**14**	**5**	**4**	**16**	**15**	**0**
		Moso	Sunae	237*	16	3	3	3	2	2	3	
			Tassiriki		17	1	6	2	3	5		
		Subtotal of Moso (%)			**33 (13.9)**	**4**	**9**	**5**	**5**	**7**	**3**	**0**
Total					**353**							

* Vanuatu Statistics Office. National Census of Population and Housing 2009

** Interviewed by the project team members

2.2. Workshops

The date and time, venue, participation, and activities conducted for the three workshops are described in Table 4.

3. Survey results: Current status of coastal resources

3.1. Review of previous survey reports

The literature reviewed contained terms that are different from CBCRM, but which are used in a similar context. These terms include co-management, village-based management, and community-based resource management. Here, the meaning of CBCRM follows the definition provided by the Secretariat of the Pacific Community (SPC) (2010:2) for community-based fisheries management (CBFM): "CBFM refers to a management system under which communities take a leading role in managing fisheries and adjacent coastal areas in partnership with, or with support from, a promoting agency."

3.2. CBCRM in the Pacific Islands

In a comparative survey of coastal resource management in the Pacific Islands, the World Bank (2000:45) stated that "there is growing consensus among experts that much of the management needs to be carried out by local communities." Johannes (2002) explained that in the 1970s, CBCRM practices in the Pacific Islands had declined, owing to factors such as the spread of the cash economy, emerging export markets, improved harvesting and transport technology, burgeoning populations, and the decline of traditional authority. However, Johannes also confirmed that, at least in Vanuatu, Samoa, Cook Islands and Fiji, CBCRM that was once declining had undergone a renaissance since the 1990s, and that CBCRM practices had increased, owing to factors such as a growing perception of resource scarcity, the re-strengthening of traditional village-based marine tenure authority through legal recognition and government support, better conservation education, and increasingly effective assistance and advice from regional and national governments and NGOs.

In designing the baseline survey and pilot projects, the project took into consideration various guidelines and manuals produced by SPC for the promotion of CBCRM in the Pacific Islands region, including:

1. "Guide to information sheets on fisheries management for communities" (2011), which is designed to assist fishing communities, and people working with them, by providing information on marine species and advice on appropriate fisheries management options.

2. "Community-based ecosystem approach to fisheries management" (2010).[6] This document describes how an ecosystem approach to

Table 4. Outline of the workshops.

Name of workshop	Period and venue	Total number and affiliation of participants	Activities
Community Workshop	25 May–15 June 2012 (7 days) in 6 target communities: Aneityum, Mangaliliu, Lelepa, Sunae, Tassiriki, Malekula	113 Community representative chief councils MPA committee members Church group members VFD staff Project members	Focus group discussions Problem analysis with describing problem trees Objective analysis
ID/OS Workshop	June 11–13, 2012 (3 days) at the VFD Conference Room	11 VFD staff Related NGOs Project members	SWOT* analysis Stakeholder analysis
Fish Calendar Workshop	18 May–1 July 2012 (1 day) in the three target communities of Aneityum, Mangaliliu, Malekula	20 Fishers in target communities	Interviews

* SWOT = strength, weakness, opportunity and threat

[6] According to Garcia et al. (2003:6), an ecosystem approach to fisheries "... strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties of biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries."

fisheries can be merged with community-based fisheries management in Pacific Island countries, and refers to the merger of approaches as the community-based ecosystem approach to fisheries management (CEAFM). Thus, it combines the three different perspectives of fisheries management, ecosystem management and community-based management.

3. "Socioeconomic fisheries survey in Pacific Islands: A manual for the collection of a minimum dataset" (2007). SPC developed this manual recognising a lack of information and knowledge about the status and use of coastal marine resources, particularly on subsistence and small-scale artisanal fisheries, is a major constraint to determining what management interventions are needed. The manual focuses on collecting a core minimum set of social and economic data on fishing communities, using structured questionnaire surveys, which is considered the easiest and most effective way in terms of the required time, and financial and human resource inputs. Using the same format, SPC hopes to connect the fisheries social and economic information in one country with that of others. Together with the manual, SPC has developed "SEMCoS",[7] a downloadable software that automates, analyses and uses the collected data.

4. "Underwater visual fish census surveys" (2002). This manual describes an underwater visual census survey method developed by the French Institute of Research for Development (IRD), and tested in a number of different locations, including New Caledonia, Tonga and Fiji. The manual contains theoretical background information, practical design and procedures for the survey, and utilisation of the data obtained.

5. "Fisheries management by communities: A manual on promoting the management of subsistence fisheries by Pacific Island communities" (2000). This manual provides technical background on fisheries and the marine environment and serves as a guide on promoting and encouraging their management by Pacific Island communities, with an emphasis on subsistence fisheries. It introduces basic resource management measures such as limited entry, limited fishing gear and methods, closed areas and seasons, catch size and quantity limits, together with government roles to promote the involvement of communities in resource management.

3.3. CBCRM in Vanuatu

3.3.1. The sociocultural background

Vanuatu provides an excellent example of the way in which existing traditional systems of coastal resource management can serve as a base on which to build modern systems of management. Ruddle et al. (1992) pointed out that, as much as possible, management schemes should be designed to: include effective indigenous strategies; conform closely to existing social, cultural and marine habitat boundaries; and adapt appropriate pre-existing (traditional) institutions underlying such customary tenure systems, particularly where there is a paucity or lack of physical and administrative infrastructure, trained manpower and funds. In Vanuatu, marine tenure rooted in custom is the primary institution that underpins community-based management and is also the primary link between VFD and communities (Amos 1993). Under the Independence Constitution (1980), all land and customary fishing grounds that had been alienated reverted to their customary owners, with whom they now reside (Government of Vanuatu 1980a).

3.3.2. Outline of the structure of the traditional system

This section is based on Ruddle 1994, which has been updated by more recent sources, as indicated in the text.

3.3.2.1. Marine territories and boundaries

Legally, based on Vanuatu's Land Reform Regulation (No. 31) of 1980, the rights of indigenous customary owners of inshore waters extend seaward only to the seaward slope of the fringing reef (Government of Vanuatu 1980b). Taurakoto (1984) observed that, according to Melanesian custom, seaward boundaries in Vanuatu extended as far as a person could fish or dive for shells. Seaward reefs in deeper waters are not owned. However, many villages make claims for more extensive areas, some extending to the horizon and including sea areas between the reef slope and offshore islands (Fairbairn 1990). The villagers of Eton Village on Efate claim that their sea area extends for 50 m beyond the reef slope, and in Eratap Village (also on Efate), villagers extend their claim by 100 m to embrace four small islands. Where villagers on one island own land on a neighbouring island, the sea area between the islands is claimed to belong to the villagers. For example, villagers on Uripiv Island, the "home" island, claim the sea area between it and Uriv Island (Fairbairn 1990). Villages are generally

[7] SEMCoS = socioeconomic manual companion software

far apart from one another and so the sea territories separating them are large. The sea territory of Eton Village, for example, extends for 35–40 km on either side of the village proper (Fairbairn 1990). Lateral boundaries of sea territories are seaward extensions of terrestrial boundaries, with some marked by large rivers. However, many lateral boundaries are imprecisely marked and have given rise to serious disputes.

3.3.2.2. Fishing rights

Johannes and Hickey (2004) stated that the clans, chiefs or villages owning land have the rights to adjacent coastal waters. Sea areas may be subdivided and the rights allocated to family heads. The rights to coastal waters contiguous to traditional land holdings are sustained by Chapter 12, Article 73 of the Constitution of Vanuatu, which states that "all land in the Republic belongs to the indigenous custom owners and their descendants". The Land Reform Act (Cap. 123) specified further that the term "land" includes "land extending to the seaside of any offshore reef but no further". As a rule, villagers have exclusive and equal rights to use adjacent reef fishing grounds (David 1990). In general, reefs and lagoons remain the common property of the villages, although there are individual ownership rights (Fairbairn 1990).

However, there is considerable diversity within Vanuatu. According to Taurakoto (1984), reef boundaries are determined based on where a person's ancestors landed on an island, or what rights they negotiated, and also on the area of land above the high water mark owned by a person. In certain areas on Ambae Island, as well as in southeast Ambrym, the scarce reefs are minutely subdivided, with single coral rocks on reefs allocated to heads of families, trespassing on which requires payment of compensation. In yet other parts of the island, access anywhere is free to all residents (Kenneth and Silas 1986). On Lelapa Island, all reefs were divided as the property of the six chiefs of the six villages on the islands (Taurakoto 1984).

Although ownership rights are clearly recognised, the precise geographical areas to which these rights apply are often unclear. Rights are most straightforward where authority is vested in a single person, the village chief, who then controls the entire reef on behalf of the village. Ownership is also clear-cut in isolated locations.

Landowners have special rights in adjacent waters, including that to lease parts of their reefs, although this right is subject to the approval of the Village (or Area) Council and the chiefs. Such exclusive rights also include using areas close to land for such special purposes as mooring sites, construction of fish traps, or the establishment of breeding areas for shellfish.

Acquisition of rights

Primary rights of resident villagers are inherited (Taurakoto 1984). Inland villages without primary rights to coastal waters gain access to fisheries through kinship ties to coastal villagers, because the interior was settled by migrants from the coast. However, such a right may be either reciprocal, with coastal villages gaining hunting rights in the interior, or be granted in return for a traditional payment of pigs, kava *(Piper methysticum)*, taro, or other valued items (Fairbairn 1990).

Rights of outsiders

Neighbouring villagers are generally allowed to use fishing areas if they first inform the owning village and, generally, also receive the permission of the Village Council. Hitherto, such an arrangement seems to have been reciprocal, although the practise is now rare. Commercialisation has now become a consideration in granting access rights. At Erakor Village on Efate Island, all outsiders must now seek the permission of the Village Council and pay a fee. One outsider was harvesting sea cucumbers, for which he paid an annual fee of approximately USD 90, and another was harvesting trochus and paying an annual fee of about USD 18 (Fairbairn 1990).

3.3.2.3. Rules

Johannes (l998) noted taboos or bans that included prohibitions on the harvesting of certain species, areal and temporal closures, and gear restrictions.

3.3.2.4. Traditional authority

There appear to be significant differences in local control and management of lagoon and reef areas (Fairbairn 1990). However, they are generally controlled by the Village Council, composed of village chiefs and elders, and sometimes by an Area Council, made up of leaders from several villages, and by landowners. There is much blurring of authority, but usually the Village Council is the paramount authority, although the principal chief is often the dominant influence, especially if he is also a major landowner.

Enforcement is problematical because of the large size of village sea territories. Poaching is discouraged by posting public notices on adjacent land borders, and Eton and Erakor villages regularly use the radio to warn against poaching.

In almost every instance, the Village Council is the principal authority governing reef and lagoon use. It has the power to impose fishing bans, enforce government regulations, resolve conflicts with neighbouring villages, and grant access rights and other arrangements with outsiders. An Area Council has an important role in reef and lagoon management,

particularly when the areas and interests of several villages are concerned. In the past, traditional leaders often have had the right to introduce management measures over larger areas under their domain on behalf of various clans (Johannes and Hickey 2004).

3.3.2.5. Sanctions

A chief and his council punish those who infringe a management taboo. Compliance appears to be higher when a taboo is established using customary practices (Johannes and Hickey 2004). Punishment appears to be graduated and includes both economic and social forms. Punishment for breaking management rules ranges from simple verbal admonitions to fines that can be paid either in cash or in kind. The latter consists of local articles of food, mats or items of customary significance such as pigs or kava. Where traditional authority is still highly regarded, the shame and embarrassment at being caught and fined is an additional social punishment.

3.3.3. Using traditional systems for modern community-based management

In 2001, Johannes and Hickey conducted a survey of 21 of the fishing villages originally studied by Johannes in 1993, to learn which resource management methods were perceived as being successful by villagers. Success was ascertained by two criteria. First, whether measures remained in operation 8–10 years after implementation. Like most conservation measures, those implemented in the early-1990s required fishermen to make sacrifices. Closing trochus harvesting, for example, meant foregoing income from selling the shell. Sacrifices judged as worthwhile by villagers meant the relevant management measures would still be operating. Second, the degree of implementation of additional measures implemented after 1993.

Survey results indicated a high rate of approval by villagers. Compared with 40 marine resource management measures in the 21 villages in 1993 by 2001, 5 had lapsed, whereas 51 new measures had been implemented. In 2001, the main marine resource management measures were 18 fishing ground closures, 11 trochus closures, 11 taboos on taking turtles, 10 sea cucumber closures, 8 spear-fishing taboos, and 7 controls or bans on using nets. All of the turtle taboos had been implemented since l993. Of the five measures that had lapsed, three involved fishing ground closures. However, during the same period six new closures were initiated in five other villages.

Formerly, villagers could take turtles and their eggs whenever they were encountered. No prohibitions on taking them were found in l993 (Johannes 1998), but in 2001, more than 60% of the communities interviewed had imposed prohibitions. Such taboos comprised 11 of the 51 new regulations, and involved 11 of the 21 villages (Johannes and Hickey 2004). It is noteworthy that this regulation on turtle harvesting was largely attributed to the performances of a travelling theatre group called "Wan Smol Bag", which in 1995 presented a play that emphasised the plight of sea turtles and the need to conserve them. This play reinforced villagers' perception of the gradual decline in sea turtle numbers during previous decades. In addition to suggesting that turtles should not be killed, the play also recommended the selection of a "turtle monitor" to encourage turtle conservation and to tag nesting and accidentally netted turtles. As a consequence, by 2003, 200 turtle monitors were based in more than 100 villages. The monitors reported violators to the chiefs and also actively persuaded people to neither disturb nesting females nor harvest the eggs. From June 2001, the turtle monitors changed their name to *vanua-tai* resource monitors ("*vanua*" means land, and "*tai*" means sea), to reflect their expanded mandate from just turtle monitors to monitors of all marine resources (Johannes and Hickey 2004).

Communities that retain strong local marine resource management systems coupled with a local conservation ethic might be expected to transform their pre-existing or traditional management systems for a modern purpose. Particularly important in this is the existence of a conservation ethic. A marine conservation ethic exists in Vanuatu. In the mid-l990s, 12 Vanuatu fishing villages employed 48 individual marine resource management measures (Anderson and Mees 1999). Enhancing, preserving or protecting marine resources were the explicit reasons given for 43 of these measures. Research by Johannes and Hickey (2004) demonstrated that most villages surveyed had a marine conservation ethic because they were not only aware of the need for local marine resource management, but were also addressing this need. However, none of that would guarantee the successful adaptation of a traditional system to a modern purpose. That would likely be undercut by the existence of major disputes within a community, such as those that have arisen from colonial histories, changing perceptions of resource valuation or rapid population growth coupled with migration, urbanisation, and the abandonment of remote rural regions (Ruddle 1994).

The success of the revival and growth of community-based management in Vanuatu is remarkable compared with most other Pacific Island countries. Important factors in this success include: 1) A firm basis in traditional marine tenure that was reinforced by a cultural revival in which the

fieldworker network of the Vanuatu Cultural Centre assisted communities with strengthening and reviving traditional management systems. This also formed part of the general cultural revival since national independence in 1980; 2) Strong village leadership; 3) Village cohesion; 4) Demonstration of the value of trochus closures by VFD, which catalysed the growth of community-based management and led communities to experiment with management based on gear restrictions or quotas, among others for other important resources; 5) An awareness that was heightened by training villagers and the participatory re-stocking of reefs with trochus coupled with follow-up monitoring. A dedicated focus on just trochus, a commercially valuable resource, was critically important. Once benefits became apparent villages considered how to improve the management of other resources. Further, trochus is an easily managed resource for which the benefits of management can be readily seen; and 6) The incorporation of selected modern elements within the traditional framework. For example, a major consequence of urbanisation is a loss of traditional values. So in peri-urban villages in Vanuatu, chiefs who find their decisions regarding marine resource rules repeatedly ignored refer offenders to the police.

3.3.3.1. Legal background

Article 73 of the Constitution of Vanuatu states that "all land in the Republic belongs to the indigenous custom owners and their descendants." Section 3 of the Land Reform Act Chapter 123 states that the land shall include "...extending to the seaside of any foreshore reef but no further" (Kuemlangan 2004). These provisions support the customary marine tenure (CMT) system, which is fundamentally important because most CBCRM practices in Vanuatu are based on CMT. The Vanuatu government is empowered to establish "marine reserves" and "community conservation areas" (CCAs), as defined by the Fisheries Act and the Environmental Management and Conservation Act, respectively. Although marine reserves and CCAs are the legal resource management and protection tools, they have seldom been applied to coastal fisheries resources in Vanuatu.

3.3.3.2. Introduction and extension of CBCRM

CBCRM was successfully introduced in Vanuatu during the early-1990s for trochus (*Tectus niloticus*). Johannes and Hickey (2004) noted that the contributing factors to the successful introduction of CBCRM in Vanuatu included the initiative shown by VFD in reaching out to communities with a species-specific focus on just trochus, rather than on coastal resources in general. VFD surveyed the trochus stock in communities and provided advice on regular multi-year closures followed by brief openings (Amos 1993). It was left to the community to decide whether or not to act on this advice.

Johannes and Hickey (2004) also confirmed the increase of CBCRM practices in Vanuatu. They stated that between 1993 and 2001, the number of CBCRM measures put into practice had more than doubled in selected communities, from 40 in 1993 to 86 in 2001. (In order to make an inter-community comparison, Johannes and Hickey [2004] classified CBCRM measures into 11 groups: trochus, fishing ground closures, turtles, sea cucumber, spearfishing, use of nets, MPAs, giant clams, crabs, destructive fishing methods, and miscellaneous.) After perceiving the effectiveness of CBCRM measures and benefits that recovered or recovering resources brought, communities applied additional measures, not only for trochus but for other species. Awareness activities developed by Wan Smol Bag played a significant role in convincing communities of the need for resource management.

Although Johannes and Hickey (2004) indicated a revival of CBCRM, Raubani (2006) wrote that throughout Vanuatu the current CBCRM still has many weaknesses because of the lack of clearly defined property rights for land and adjacent reefs (including access rights for the resources inhabiting the reefs), as well as the conditions of communities, such as a weakening respect for and cooperation with the community leader and the low availability of alternative livelihoods. Raubani (2006:19) stated that (according to his personal communication with Hickey):

> "...a number of the traditional management practices are still in practice in areas further from the urban centers which are less subjected to Western influence and thus still maintain their values and beliefs. For instance in Torba Province, many areas of Malampa, Penama, and Tafea Province, people in many villages would still hold onto these practices as they have maintained their values and beliefs to this day."

4. Information on the target sites

4.1. Aneityum

Johannes and Hickey (2004) investigated the existing CBCRM measures in Analcauhat as of 1993 and 2001. Their results showed that CBCRM measures increased from three in 1993 to four in 2001 (CBCRM measures for trochus, fishing closures, and miscellaneous in 1993. In 2001, the CBCRM measure for sea cucumber was added). Biological surveys and simple stock assessments were conducted by IRD in 2011–2012 in Analcauhat, for trochus, green snail, and giant clams inside and outside the taboo area

(Table 5). Tentative results are summarised by Dumas (n.d.).

Table 5. Results of stock assessment by the French Institute of Research for Development (IRD) in Aneityum.

Analcauhat	Inside taboo area	Outside taboo area
Species: Trochus (*Tectus niloticus*)		
Mean density (#/ha)	560.8	97.5
Total stock (extrapolation) (kg)	430.8	30.0
Species: Green snail (*Turbo marmoratus*)		
Mean density (#/ha)	50.0	2.5
Species: Giant clam (*Tridacna maxima*)		
Mean density (#/ha)	73.3	27.5

* Surveys are ongoing; therefore, results are subject to modification.

4.2. Malekula

VFD (2011) presented the results of underwater visual census stock assessment surveys in Uri, Uripiv and the Crab Bay area, in Malekula. VFD indicated that the average size and abundance of sea cucumbers in the surveyed areas have remained small despite the national moratorium declared in 2007, possibly because of their slow growth rate and the illegal harvesting after the moratorium.

The Vanuatu Environment Unit (2007a, 2007b) presented detailed findings from surveys of households, reef fish, fish marketing, and crab marketing conducted using questionnaires and focusing on the use and management of the land crab, *Cardisoma hirtipes*. These findings provide good baseline information on the status of resources, coastal resource use, and socioeconomic conditions of the communities around Crab Bay.

Two considerations for project implementation have been stressed by the Vanuatu Environment Unit. First, it is important to understand differences among communities. For example, only a few communities participate in commercial fishing. Although in some communities most households engage regularly in subsistence fishing, in others less than half the households fish regularly. Second, possible weaknesses of the Community Area Resource Map and Action Plan include the level of reliance on external organisations; the largely unmet assumption that provincial staff and public servants based on Malekula would facilitate projects; and a lack of a philosophy on adaptive management. Hence, projects must be designed in a way that nurtures local capacity and initiative. Further, because the chiefs in the Crab Bay area no longer receive full support and cooperation from community members, it may be necessary to consider supplementary approaches to reach and engage people who do not cooperate fully with a chief's requests.

Johannes and Hickey (2004) also investigated CBCRM measures that existed in Uri and Uripiv in 1993 and 2001. Their results showed that measures increased from 4 in 1993 to 12 in 2001 in Uri, and in Uripiv from 1 in 1993 to 4 in 2001. In 2001, CBCRM measures increased for: fishing ground closures; the taking of turtles, sea cucumbers and giant clams; spearfishing and using nets; marine protected areas; and "miscellaneous", according to the categorisation of Johannes and Hickey.

SPC (2003) conducted an underwater visual census (UVC) survey for finfish and invertebrates, and a socioeconomic survey for Uri and Uripiv. The results demonstrate that: 1) existing management measures in Uri and Uripiv were adequate to ensure the sustainable use of finfish resources at the current fishing level, and that 2) resources in Uri and Uripiv were in good condition. However, reef finfish should be considered as a complementary, rather than the principal, source of food and income because the band of reef surrounding Uri and Uripiv may be too narrow to sustain intense long-term fishing pressure.

4.3. Efate

Johannes and Hickey (2004) investigated CBCRM measures that existed in Mangaliliu in 1993 and 2001, and found they had increased from three in 1993 to four in 2001. In 1991, CBCRM measures for trochus harvesting, fishing ground closures, and "miscellaneous" were in place. In 2001, a measure for sea cucumbers was added.

Beckensteiner (2011) conducted a similar survey in 2011 and found that four more CBCRM measures were in place in Mangaliliu, dealing with the exploitation of shells and the use of fishing gear. The survey conducted by Beckensteiner (2011) targeted seven communities on Efate Island (Paunangisu, Siviri, Mangaliliu, Eratap, Takara, Tanoliu and Emua), which allowed an inter-community comparison. The survey pointed out that community management plans tend to be induced by external parties, such as NGOs and donors, and the scope of the plan (either a comprehensive resource management plan or just an MPA plan) tends to be affected by such external agencies. The survey also noted that most fishermen wish to change or upgrade their management system and seem sensitive to changes in their reef resources, frequently demonstrating a

desire to protect them. Finally, the survey found that overall, the sustainability of local rules seems low when external agencies are no longer present.

SPC (2003) conducted a UVC survey for finfish and invertebrates, and a socioeconomic survey for Moso Island. The main results demonstrated that finfish resources in Moso appear to be in relatively good condition, although some impact from fishing is suspected. The survey further noted the following:

- trochus were present but found only at low levels;
- green snails were not found;
- income opportunities from fisheries alone are limited (owing to the distance to the most productive fishing ground, which is the outer reef) and the distance, time and costs involved in marketing finfish at Port Vila; and
- the community of Moso is unable to enforce the rules governing access to its fishing grounds, and suffers from frequent illegal intrusions in the distant outer reef by fishermen from Lelepa.

Biological surveys and simple stock assessments were conducted by IRD in 2011–2012 in Mangaliliu, for trochus, green snails and giant clams inside and outside the taboo area (Table 6). The tentative results are summarised by Dumas (n.d.).

Table 6. Results of stock assessment by the French Institute of Research for Development (IRD) in Mangaliliu.

Mangaliliu	Inside taboo area	Outside taboo area
Species: Trochus (*Tectus niloticus*)		
Mean density (#/ha)	90.0	22.5
Total stock (extrapolation) (kg)	1,220.0	894.0
Species: green snail (*Turbo marmoratus*)		
Mean density (#/ha)	21.4	6.0
Total stock (extrapolation) (kg)	549.0	998.0
Species: Giant clam (*Tridacna maxima*)		
Mean density (#/ha)	121.4	141.2
Total stock (extrapolation) (kg)	3,109.0	23,314.0

* Surveys are ongoing; therefore, results are subject to modification.

Table 7. Trends in fisheries resources in target areas.

	Aneityum	Malekula	Efate	Overall
Increased	3	6	3	12
(%)	100.0	50.0	100.0	66.7
No change	0	6	0	6
(%)	0.0	50.0	0.0	33.3
Decreased	0	2	0	2
(%)	0.0	16.7	0.0	11.1

5. Observations and perceptions of fishermen

5.1. Trends (increase/decrease) by species group

The baseline survey conducted so far demonstrates that fisheries resources in the target communities have been increasing, except for those of Moso on Efate (Tables 7 and 8). For a more detailed, species-specific survey of each site, target fisheries resources from each site were categorised into different groups (Table 9). Ease of accessibility to fisheries resources in coastal communities of Vanuatu depends on their distance offshore and the fishing gear used. For most community members, resources within the reef are easy to access because they do not require expensive inputs such as a boat, fuel or modern gear. Therefore, such resources tend to be fished heavily unless managed effectively. Interviews were conducted to understand community members' perceptions regarding the condition of each group of fisheries resources (Table 10).

5.2. Changes in size and/or species composition

Interviews were conducted in order to understand community members' perceptions regarding changes in the average size of fisheries resources (Table 11).

The main points demonstrated by Tables 10 and 11 are summarised below.

- Community members from Aneityum perceive that crustaceans within the reef (lobster) are decreasing, whereas finfish groups outside the reef (i.e. large pelagic and bottom species) are increasing. Information with which to judge the condition of tuna resources is lacking.
- Community members from Malekula perceive that resources are generally in good condition, whereas bottom finfish and land crab resources are decreasing.

Table 8. Trends in fish catches in target areas.

Island	Target area	Target community	Trend of fish catch
Aneityum	Aneityum	Analcauhat	Increased
		Umetch	Increased
		Port Patrick	Increased
Malekula	Crab Bay	Barrick	Increased
		Bushman Bay	No change
		Hatbol	no answer
		Limap,	No change
		Lingarakh	Increased
		Lowni	Increased
		Lo Sarsar	Increased
		Mapest	No change
		New Bush	No change
		Portidur	Increased
		Teremp	Increased
		Tevaliant	No change
		TFC	Increased
		Tembimbi	No change
	Uri	Uri	Increased
	Uripiv	Uripiv	Increased
Efate	Mangaliliu	Mangaliliu	Increased
	Lelepa	Lelepa	No change
	Moso	Sunae	Decreased
		Tassiriki	Decreased

Source: Project baseline survey

Table 9. Target species at each site.

		Aneityum	Malekula		Efate	
			Crab Bay	Uri and Uripiv	Moso	Mangaliliu and Lelepa
Within reef	shellfish	trochus, green snail, giant clam	giant clam			giant clam
	crustacean	lobster	lobster		lobster	lobster
	others	octopus	octopus		octopus, squid	octopus, squid
	finfish	mullet, blue fish	pico, big bel, blue fish, napoleon, mustash fish, mullet		red mouth, mullet, mustash fish,	blue fish, parrot fish,
Outside the reef	finfish (small pelagic)	mangroo, sardine	mangroo, sardine		mangroo, sardine	mangroo, sardine
	finfish (large pelagic)	tuna, wahoo, dogtooth tuna, marlin	yellowfin tuna, skipjack, trevally		trevally, tuna, dogtooth tuna, skipjack, marlin	yellowfin tuna, skipjack, wahoo, dolphinfish, dogtooth tuna
	finfish (bottom)	poulet, snapper, brim, grouper	poulet, snapper, grouper		poulet, snapper	poulet, snapper
Others	(land) crab		mud crab, red crab, white crab			mud crab

Table 10. Trends in resource condition by species group at each site.

		Aneityum		Malekula				Efate			
				Crab Bay		Uri and Uripiv		Moso (Tassiriki and Sunae)		Mangaliliu and Lelepa	
		Within taboo	Out of taboo	Within taboo	Out of taboo	Within taboo	Out of taboo	Within taboo	Out of taboo	Within taboo	Out of taboo
Within reef	shellfish	↑	↑*2	↑	↑	↑	↑	–	–	→*6	→*6
	crustacean	↑	↓	↑	↑	↑	↑	*3	↓	↓	↓
	others	↑	↓	↑	↑	↑	↑	↓*4	↓*4	↑	↓
	finfish	↑	↓	↑	↑	↑	↑	↓	↓	→	↓*2
Outside the reef	finfish (small pelagic)	↓	–	↑	↑	↑	↑	↓	↓	*7	
	finfish (large pelagic)	–	↑*1	–	↑	–	↑	–	*5	–	↑*2
	finfish (bottom)	–	↑	–	↑	–	↓	–	→	–	↑*2
Others	(land) crab	–	–	↓	↓	↓	↓	–	–	–	–

↑, →, and ↓ indicates "increasing", "remains same" and "decreasing", respectively

*1: Includes species that are not currently utilised and there is not enough information to judge the resource condition

*2: Includes species perceived as "remains same"

*3: Not many found and difficult to say it is increasing or decreasing

*4: Sunae perceived as "remains same" while Tassiriki perceived as "decreasing"

*5: Mixed result with "not sure because there is no catch" and "remains same"

*6: Includes "increasing"

*7: Community members perceive that mangroo is decreasing but sardine is increasing

Table 11. Trends in average size of marine species.

		Aneityum		Malekula				Efate			
				Crab Bay		Uri and Uripiv		Moso (Tassiriki and Sunae)		Mangaliliu and Lelepa	
		Within taboo	Out of taboo	Within taboo	Out of taboo	Within taboo	Out of taboo	Within taboo	Out of taboo	Within taboo	Out of taboo
Within reef	shellfish	↑	*1	↑	↑	↑	↑	–	–	→	→
	crustacean	↑	↑	↑	↑	↑	↑	*7	↓	→	→
	others	↑	↓	↑	↑	↑	↑	↓*8	↓*8	↑	↑
	finfish	↑	↓	↑	↑	↑	↑	↓	↓	→	↓*2
Outside the reef	finfish (small pelagic)	↑	*2	–	↑*4	–	↑*4	–	↓	–	→
	finfish (large pelagic)	–	↑*3	–	↑*3	–	↑*3	–	→*3	–	↑*3
	finfish (bottom)	–	↑	–	↑*5	–ω	↑*5	–	→*3	–	↑*3
Others	(land) crab	–	–	↑	↓	↑*6	↓*6	–	–	↓	↓

↑, →, and ↓ indicates the average fish size is "getting bigger", "remains same" and "getting smaller", respectively

*1: Community members perceive that the average size of trochus is getting bigger while that of giant clam is getting smaller

*2: Community members perceive that the average size of mangroo is getting bigger while that of sardine is getting smaller

*3: Includes species that are not currently utilised, and there is not enough information to judge the average size

*4: Community members perceive that the average size of mangroo is getting bigger while that of sardine remains the same

*5: Community members perceive that the average size of snapper and grouper is getting bigger while that of poulet is getting smaller

*6: Community members perceive that the average size of mud crab has remained same

*7: Not found many within marine protected area

*8: Community members in Sunae perceive that the average size of squid and octopus has remained the same

*9: Includes some species that are perceived as remaining the same size

- Community members from Moso Island (Tassiriki and Sunae) perceive that many of their fisheries are decreasing, whereas those in Mangaliliu and Lelepa perceive that their fisheries resources are better preserved and more abundant than those of Moso Island.
- In general, reef fisheries resources are used and even perceived of as being over utilised. On the other hand, coastal community members do not fully use large pelagic and deep bottom species, and lack information to evaluate the condition of these resources.

6. Use of coastal resources

Fish calendars (Appendix 2) were developed in a dedicated workshop, and describe the seasonality, fishing method, catch size, unit size, average market price, and frequency of fishing operations per week for the target species.

6.1. Species targeted

According to these fish calendars, there are 34 species in the target areas, and fishery products differ depending on the target area. In Aneityum and Malekula, 19 species are identified, whereas 11–13 species occur in Lelepa, Mangaliliu and Tassiriki. Seven species are targeted in all or almost all areas: skipjack tuna (*Katsuwonus pelamis*), poulet (*Etelis radiosus*), mangroo (bigeye scad, *Selar crumenophthalmus*), grouper (*Epinephelus* spp.), octopus (*Octopus cyanea*), sardine (*Hypoatherina bamesi, Atherinomorus lacunosus*), and blue fish (parrotfish) (*Scarus* sp., *Chlorurus* sp.). Trochus (*Tectus niloticus*), green snail (*Turbo marmoratus*), clam shell, and shellfish occur only in Aneityum, and karong (*Caranx* spp.), pico (*Siganus* spp.), big bel (*Paraluteres prionurus*), red mouth (*Lethrinus miniatus*), and some species of crab are targeted particularly in Malekula. Lobsters (*Panulirus penicillatus, P. versicolor, Parribacus caledonicus*), some of the most important income-producing resources, occur in Aneityum, Mangaliliu and Sunae. About 85% of the species targeted in Tassiriki are the same as those in Aneityum. Further, more than 80% of the target species in Mangaliliu were also identified in Sunae. Although Lelepa is close to Sunae, the similarity in species between them is less than that found elsewhere.

6.2. Fishing gear used

Table 12 shows the types of fishing gear used in target areas. Some respondents noted that several types of fishing gear are owned by a family, whereas in several communities of Malekula, and especially in Uri and Uripiv, families own fewer types. The variety and number of gear items possessed by each household varies depending on the community.

The handline is the most common fishing gear used. More than 76% of households in Malekula use it, as do 85% of households in Aneityum and 75% in Efate. The second most common fishing gear is the spear gun, used by 49% of households in Aneityum and 63% in Efate. Gill nets are used by 20% of respondents in Malekula. Cast nets are uncommon in Efate and Aneityum, whereas in Malekula, 24% of the total number of cast net users live. Fish traps are not used anywhere.

Over 40% of all households in the target areas own a boat, but only about 7% of respondents in all target areas own an outboard motor, a much lower rate than for fishing gear ownership. For instance, only 3 households out of 100 in Malekula own an outboard motor.

6.2.1. Current level of utilisation

Figure 1 indicates the average monthly fish catch volume by fishing ground in each target area. The total volume of monthly fish catch was the largest in Aneityum, at over 465 kg. At 350 kg, Crab Bay had the second largest volume. Both Lelepa and Mangaliliu, and Moso, in Efate, had a catch of 200 kg/month. Production in Uri and Uripiv was 155 kg/month, the lowest among all areas.

The main fishing area in Aneityum is located offshore, although some fish are caught in the coastal area. According to MPA committee members, this is considered as fishing around or near the edge of a reef. Fish caught this way include snappers.

The fish catch trend in Crab Bay is similar to that of Aneityum. Barrick and TFC[8], the main fishing communities in Crab Bay, have more significant catches than do villages in coastal areas. However, TFC depends more on reef resources than does Barrick, where more than half the catch is from outside the reefs (Fig. 2).

In Uri and Uripiv (Malekula), and Moso (Efate), fishing pressure on reefs fronting the community is high. In Moso, the catch volume from the reef is the highest among all areas. According to one community member, the majority of the reef fish harvest comprises shellfish taken mainly for consumption by the harvesting household.

A community workshop revealed high fishing pressure in the coastal areas of Lelepa and Mangaliliu. Many people fish outside the traditional taboo area of their own community, which is usually in front of the village. However, some reportedly fish in

[8] TFC refers to Terfick Company, although this name is rarely used. Instead, local people refer to the community as TFC.

Table 12. Quantity of boats, outboard engines (OBE) and fishing gear used in target areas.

				Fishing gear				
	# of surveyed households	Own boats	Own OBE	Hand line	Spear gun	Gill net	Cast net	Fish trap
Malekula	**84**	**30**	**1**	**76**	**19**	**28**	**20**	**0**
Barrick	6	4		6	4	4	3	0
Bushman Bay	5			5	0	2	1	0
Hatbol	6							
Limap	6							
Lingarakh	11	11		11	9	9	10	0
Lo Sarsar	3			2	0	2	0	0
Lowni	4	2	1	4	0	1	0	0
Mapest	5			4	1	2	2	0
New Bush	5			5	1	2	0	0
Portidur	6	2		6	0	3	1	0
Tembimbi	6	2		5	0	0	1	0
Teremp	5			4	1	2	0	0
Tevaliant	6			4	0	1	0	0
TFC	5	4		4	2	0	1	0
Uri	5	5		5	0	0	0	0
Uripiv	16	12	2	11	1	0	1	0
Efate	**40**	**20**	**4**	**30**	**25**	**9**	**1**	**0**
Lelepa	14	9	4	12	6	1	0	0
Mangaliliu	12	3		12	10	6	1	0
Sunae	6	5		2	3	2	0	0
Tassiriki	8	3		4	6	0	0	0
Aneityum	**39**	**12**	**6**	**33**	**19**	**8**	**5**	**0**
Analcauhat	23	7	4	21	11	3	3	0
Port Patrick	8	5	2	8	6	5	2	0
Umetch	8			4	2	0	0	0

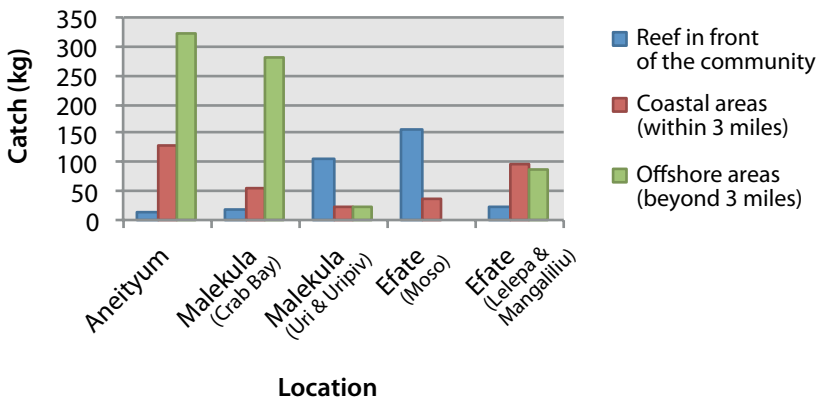

Figure 1. Monthly fish catch volume by fishing area.

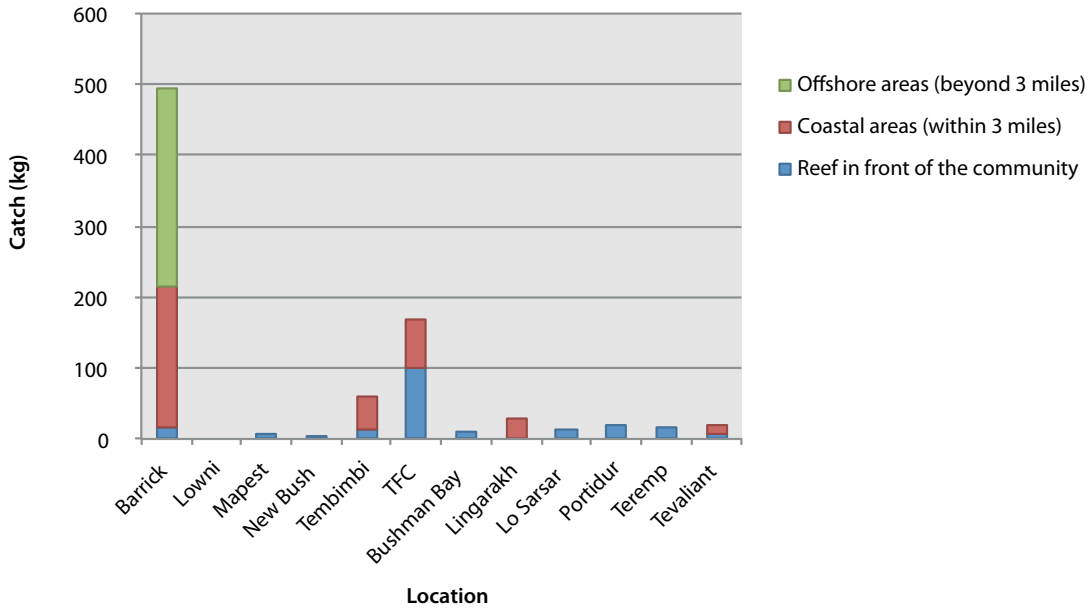

Figure 2. Monthly fish catch volume in Crab Bay.

Table 13. Market channels for local fisheries and other products in target areas.

		Overall		Efate		Malekula		Aneityum	
Agriculture	Market in community	8	34.8%	1	25.0%	5	31.3%	2	50.0%
	Market in neighbouring areas	15	65.2%	3	75.0%	10	62.5%	2	50.0%
	Middlemen	11	47.8%	0	0.0%	10	62.5%	1	25.0%
	Local stores/shops	4	17.4%	1	25.0%	2	12.5%	1	25.0%
	Household consumption	7	30.4%	0	0.0%	5	31.3%	2	50.0%
Fisheries	Market in community	9	39.1%	1	25.0%	5	31.3%	3	75.0%
	Market in neighbouring areas	15	65.2%	4	100.0%	9	56.3%	2	50.0%
	Middlemen	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Local stores/shops	7	30.4%	0	0.0%	5	31.3%	2	50.0%
	Household consumption	10	43.5%	1	25.0%	7	43.8%	2	50.0%
Livestock	Market in community	10	43.5%	1	25.0%	7	43.8%	2	50.0%
	Market in neighbouring areas	13	56.5%	2	50.0%	9	56.3%	2	50.0%
	Middlemen	4	17.4%	0	0.0%	4	25.0%	0	0.0%
	Local stores/shops	7	30.4%	1	25.0%	5	31.3%	1	25.0%
	Household consumption	6	26.1%	1	25.0%	3	18.8%	2	50.0%

other communities' taboo area. Some participants pointed out that these violations have caused tension among the communities in this region.

6.3. Processing, marketing and pricing

As shown in Table 13, in the Efate and Malekula areas, most target communities sell their products in neighbouring communities, such as at the public markets in Port Vila and Lakatoro. No respondent sold fishery products to middlemen. At the workshop, participants assumed that people sold their own products directly to local wholesalers or retailers. More detailed information was obtained through interviews with community members (Tables 14–19).

Fish processing is practically non-existent in the target sites. The only exception is Aneityum, where boiled lobster is sold to tourists visiting Mystery Island. Octopus, small pelagic finfish (bigeye scad and sardine), and shellfish harvested within the reef tend to be either consumed within the fisherman's household or used for bait, whereas bottom finfish (poulet, snapper, grouper) and large pelagic finfish (tuna, wahoo) tend to be sold for cash.

Table 14. Processing, marketing and pricing of marine species in Aneityum.

		Species	Processing	Market channel	Selling price	Cost
Within reef	shellfish	trochus	none	100% sold to processors	shell: VUV 300/kg	Fuel 3 gallons per trip VUV 300/ litre Engine oil VUV 100/ 5 litre of fuel Fishing hook 5-6 (VUV 70/ hook) Wire and rope VUV 200/m
		giant clams	none	100% household consumption		
	crustacean	lobster	boiled for tourists	90% sold to tourists 10% household consumption	AUD 20–50/ lobster	
	others	octopus	none	100% household consumption (and bait for fishing)		
	finfish	mullet, blue fish	none	50% sold household within community 50% household consumption	mullet: VUV 150/fish blue fish: VUV 800–1,000/fish	
Outside reef	finfish (small pelagic)	mangroo, sardine	none	100% sold consumption (and bait for fishing)	mangroo: VUV 150/fish sardine: VUV 100/fish	
	finfish (large pelagic)	tuna, wahoo, marlin	none	95% sold within community 5% household consumption	VUV 400/kg	
		skipjack	none	100% household consumption (and bait for fishing)	VUV 400/kg	
	finfish (bottom)	poulet, snapper	none	90% sold within community 10% household consumption	VUV 400/kg	
		grouper	none	95% sold within community 5% household consumption	VUV 400/kg	

Note: VUV 100.00 = AUD 1.06 or USD 1.08 (31 August 2012)

Table 15. Processing, marketing and pricing of marine species in Malekula.

		Species	Processing	Market channel	Selling price		Cost
					in community	in town	
Within reef	shellfish	giant clam (Natarai)	none	100% household consumption			Fuel 5–10 litres (VUV 250/litre)
	crustacean	lobster	none	90% sold in town 10% household consumption	VUV 700/kg	VUV 700/kg	Bait VUV 500–1,000 Transport VUV 1,000
	others	octopus	none	40% sold in town 30% sold to nearby community 30% household consumption	VUV 300–700/ unit	VUV 350/kg	
	finfish	rabbitfish, red mouth, mustash fish, mullet	none	50% sold in town 10% sold to nearby community 40% household consumption	VUV 300/kg	VUV 250–350/kg	
Outside reef	finfish (small pelagic)	mangroo	none	70% sold to nearby community 30% household consumption	VUV 20–40/ fish		
		sardine	none	10% sold to fishers for bait 90% household consumption			
	finfish (large pelagic)	skipjack	none	90% sold in town 10% household consumption	VUV 250/kg	VUV 250–300/kg	
		trevally	none	10% sold in town 10% sold to nearby community 30% sold within community 50% household consumption	VUV 300/kg	VUV 250–300/kg	
	finfish (bottom)	poulet	none	90% sold in town 10% household consumption	VUV 300/kg	VUV 400–500/kg	
		snapper	none	90% sold in town 10% household consumption	VUV 300/kg	VUV 350–450/kg	
		grouper	none	70% sold in town 30% household consumption	VUV 300/kg	VUV 250/kg	

Note: VUV 100.00 = AUD 1.06 or USD 1.08 (31 August 2012)

Table 16. Processing, marketing and pricing of marine species in Sunae, Efate.

		Species	Processing	Market channel	Selling price		Cost
					in community	in town	
Within reef	shellfish						Food: VUV 300 Ice: VUV 300 Battery: VUV 400 Transport (truck): VUV 1,000 Fuel: VUV 360 Market: VUV 400
	crustacean	lobster	none	60% sold in town 40% household consumption		VUV 1,000/kg	
	others	octopus	none	30% sold in town 70% self-household consumption		VUV 1,000/kg	
		squid	none	50% sold in town 50% self-household consumption		VUV 1,000/kg	
	finfish	mustash fish, red mouth, mullet	none	90% sold in town 10% self-household consumption		VUV 500/kg	
Outside reef	finfish (small pelagic)	mangroo	none	90% sold in town 10% household consumption	VUV 200–300/kg	VUV 500/kg	
		sardine	none	20% sold within community 80% household consumption	VUV 400/kg		
	finfish (large pelagic)	tuna, skipjack	none	60% sold to nearby community 40% household consumption	VUV 600–700/kg		
	finfish (bottom)	poulet, snapper	none	100% sold to nearby restaurant (Havannah)	VUV 800–1,000/kg		

Note: VUV 100.00 = AUD 1.06 or USD 1.08 (31 August 2012)

Table 17. Processing, marketing and pricing of marine species in Tassiriki, Efate.

		Species	Processing	Market channel	Selling price		Cost
					in community	in town	
Within reef	shellfish		none				Ice: VUV 1,000 Transport: VUV 1,500 Market fee: VUV 400 Boat fee: VUV 2,000 Battery: VUV 800
	crustacean		none				
	others	squid	none	100% sold in town		VUV 1,500/kg	
		octopus	none	100% sold in town		VUV 1,000/ unit	
	finfish	red mouth, mullet, blue fish	none	70% sold in town 10% sold within community 20% household consumption	VUV 300/kg	VUV 500/kg	
Outside reef	finfish (small pelagic)	mangroo	none	70% sold in town 10% sold within community 20% household consumption	VUV 300/kg	VUV 500/kg	
		sardine	none	100% household consumption			
	finfish (large pelagic)	tuna, skipjack	none	not much catch			
	finfish (bottom)	poulet, snapper	none	not much catch			

Note: VUV 100.00 = AUD 1.06 or USD 1.08 (31 August 2012)

Table 18. Processing, marketing, and pricing in Lelepa, Efate.

		Species	Processing	Market channel	Selling price		Cost
					in community	in town	
Within reef	shellfish	giant clam	none	70% sold in town 30% household consumption		VUV 200/ piece of laplap	Transport: VUV 4,000 Ice: VUV 1,000 Battery: VUV 1,000 Fuel: VUV 2,000 Food and drink: VUV 400
	crustacean		none				
	others	squid	none	not much catch			
	finfish	blue fish, parrotfish	none	50% sold in town 30% sold within community 20% household consumption	VUV 300/kg	VUV 600–700/kg	
Outside reef	finfish (small pelagic)	sardine	none	50% sold in town 50% household consumption	VUV 200/kg	VUV 600/kg	
		mangroo	none	40% sold in town 20% sold nearby community 40% household consumption	VUV 150/fish	no information	
	finfish (large pelagic)	yellowfin tuna	none	80% sold in town 20% household consumption	VUV 500–600/kg	VUV 1,000–1,500/kg	
		skipjack	none	69% sold in town 20% sold to nearby community 1% sold within community 10% household consumption	VUV 500–600/kg	VUV 1,000–1,500/kg	
		wahoo	none	90% sold in town 10% household consumption		VUV 1,000–1,500/kg	
	finfish (bottom)	poulet	none	80% sold in town 20% household consumption	VUV 500–600/kg	VUV 1,000–1,500/kg	

Note: VUV 100.00 = AUD 1.06 or USD 1.08 (31 August 2012)

Table 19. Processing, marketing and pricing of marine species in Mangaliliu, Efate.

		Species	Processing	Market channel	Selling price		Cost
					in community	in town	
Within reef	shellfish		none				Transport: VUV 3,000 Ice: VUV 1,000 Battery: VUV 1,000 Fuel: VUV 2,000 Food and drink: VUV 400
	crustacean	lobster	none	100% sold in town		VUV 1,000/kg	
	others	squid	none	80% sold in town 20% household consumption	VUV 300–350/kg	VUV 2,000/unit	
		octopus	none	80% sold in town 20% household consumption	VUV 300–350/kg	VUV 450/kg	
	finfish	blue fish	none	80% sold in town 20% household consumption	VUV 300–350/kg	VUV 450/kg	
Outside reef	finfish (small pelagic)	mangroo	none	80% sold in town 20% household consumption	VUV 300–350/kg	VUV 450/kg	
	finfish (large pelagic)	tuna	none	80% sold in town 20% household consumption	VUV 300–350/kg	VUV 600/kg (Bon Marché)	
		skipjack	none	80% sold in town 20% household consumption	VUV 300–350/kg	VUV 500–700/ fish	
		wahoo, dogtooth tuna	none	80% sold in town 20% household consumption	VUV 300–350/kg	VUV 600/kg	
	finfish (bottom)	poulet	none	100% sold in town (inc. nearby restaurant)	VUV 600–800/kg	VUV 1,000/kg	
		snapper	none	50% sold in town 50% household consumption	VUV 300–350/kg	VUV 450/kg (Bon Marche)	

Note: VUV 100.00 = AUD 1.06 or USD 1.08 (31 August 2012)

7. Characteristics of fishing communities

According to the 2009 national census, the rural population of Vanuatu increased 20.6% between 1999 and 2008, thereby leading to an increased production and consumption of marine resources for household use. The results of the questionnaire-based surveys also show that the population increased between 2010 and 2012 in all 23 target communities, except Lowni and Mapest on Malekula.

Table 20 shows the number of communities with social infrastructures for education, health care and public transport. In Aneityum and Efate, primary schools and health posts (or clinics) exist in most target communities. However, irregularly operated boats are the only means of public transport for Aneityum. Most Malekula communities have good access to central towns although many lack a school.

7.1. Social characteristics

7.1.1. Equality in the target societies

To understand the gap in each community regarding participation in social activities, project team members asked communities about the level of equality in education, property and land ownership, social status, generation, tensions between long-term settlers and newcomers, politics, and religion (Table 21). Responses were scored as follows and averaged by community: 1 = not at all; 2 = somewhat; and 3 = very much so. Therefore, the higher the average score, the stronger the perceived existing inequity.

Table 20. Existence of social infrastructure in target communities.

	Aneityum	Malekula	Efate	Overall
Number of target communities	3	16	4	23
Primary school exists				
Yes	3	5	3	11
No	0	10	1	11
Secondary school exists				
Yes	1	1	0	2
No	2	13	4	19
Health post/clinic exists				
Yes	3	7	3	13
No	0	8	1	9
Public transport available				
every day	1	13	3	17
4–6 days/week	0	1	0	1
1–3 days/week	2	2	1	5

Source: Project baseline survey
Note: For some questions, total figures do not match the total number of target communities because some respondents did not answer the questions.

Table 21. Average scores regarding the gap in social activities.

	Aneityum	Malekula		Efate	
		Crab Bay	Uri and Uripiv	Moso	Lelepa and Mangaliliu
Education	1.19	1.23	1.60	1.83	1.88
Property	1.64	1.59	1.50	1.83	2.12
Land	2.16	1.73	2.27	1.25	2.20
Social status	1.38	1.24	1.75	1.83	1.96
Generation	1.66	1.33	2.00	1.83	2.12
Ancient and new settlers	1.83	1.18	1.80	1.42	1.96
Political party	2.35	1.17	1.86	1.67	2.16
Religion	1.82	1.43	2.20	1.50	2.08
Total	12.21	9.47	12.78	11.66	14.4
Average	1.75	1.36	1.87	1.65	2.06

Source: Project baseline survey
Note: The answers "Not at all," "Somewhat," and "Very much" were given the scores of 1, 2, and 3, respectively. The higher the score, the larger the gap.

Lelepa and Mangaliliu show relatively high scores in most areas. In contrast, the Crab Bay area shows generally lower scores. Land issues generate gaps in all communities except Moso, as do political issues in Aneityum, Lelepa and Mangaliliu.

7.1.2. Disputes in the community

As shown in Figure 3, disputes exist in each target community, with some 60% of interviewees answering that their community experiences some disputes. The ratios in Aneityum, and Uri and Uripiv are high, whereas those in Crab Bay and Moso are relatively low.

In Aneityum, "the difference of clans", which interviewees attributed to racism, is the most significant cause of dispute in the community (Fig. 4). In contrast, the main cause of dispute in Uri, Uripiv, Lelepa and Mangaliliu is "division/no cooperation in the community" (Fig. 5).

7.1.3. Participation in community activities

In all target areas, the majority of people answered that the willingness to participate in community activities is "high" or "average". However, in Lelepa and Mangaliliu, the ratio for "high" is lower than other regions (Fig. 6).

Results also vary by community within a region. For example, Crab Bay, Lingarakh, Barrick, and Limap are considered suitable for community participatory activities, whereas Lowni and Tevaliant are not.

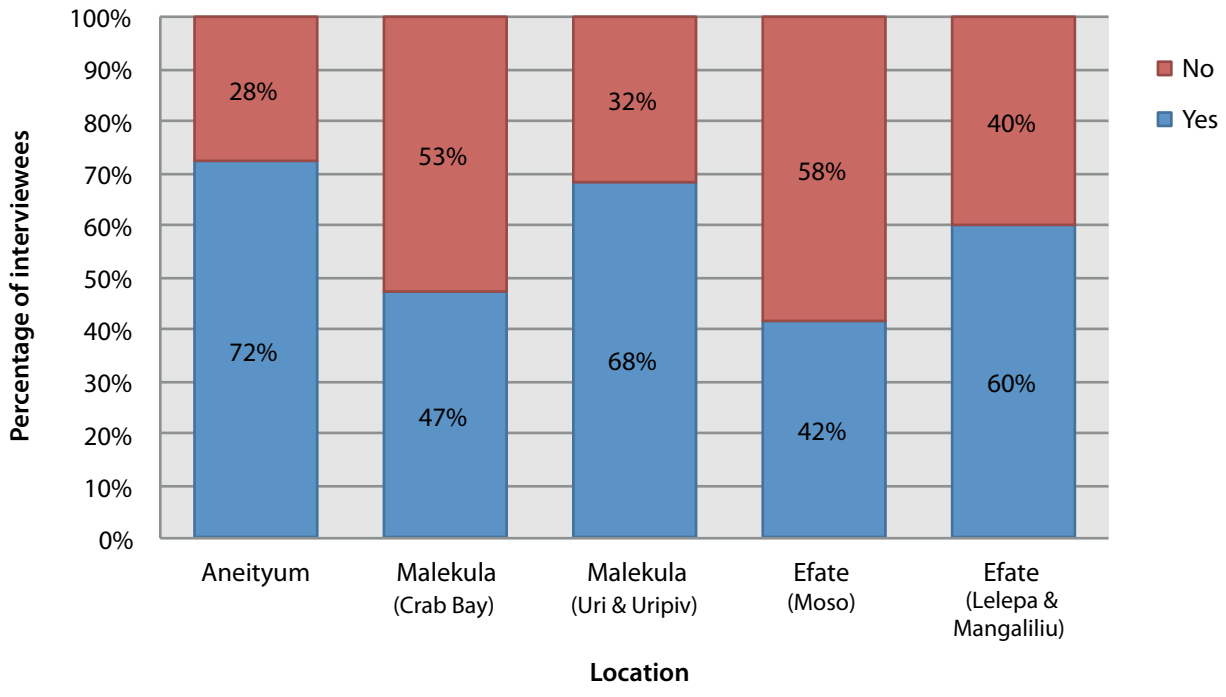

Figure 3. Perceptions about the existence of community disputes.

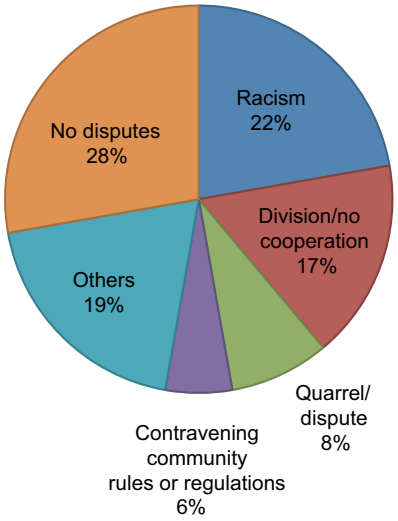

Figure 4. Causes of disputes in Aneityum.

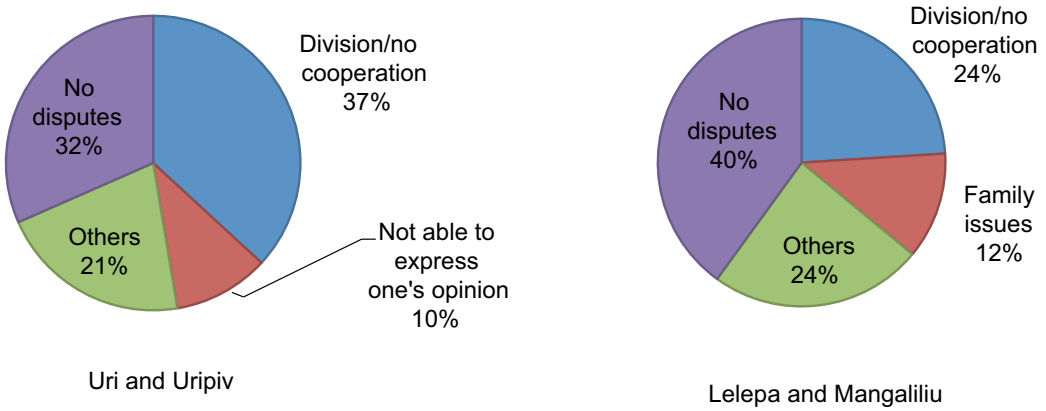

Figure 5. Causes of disputes in Uri and Uripiv, and Lelepa and Mangaliliu.

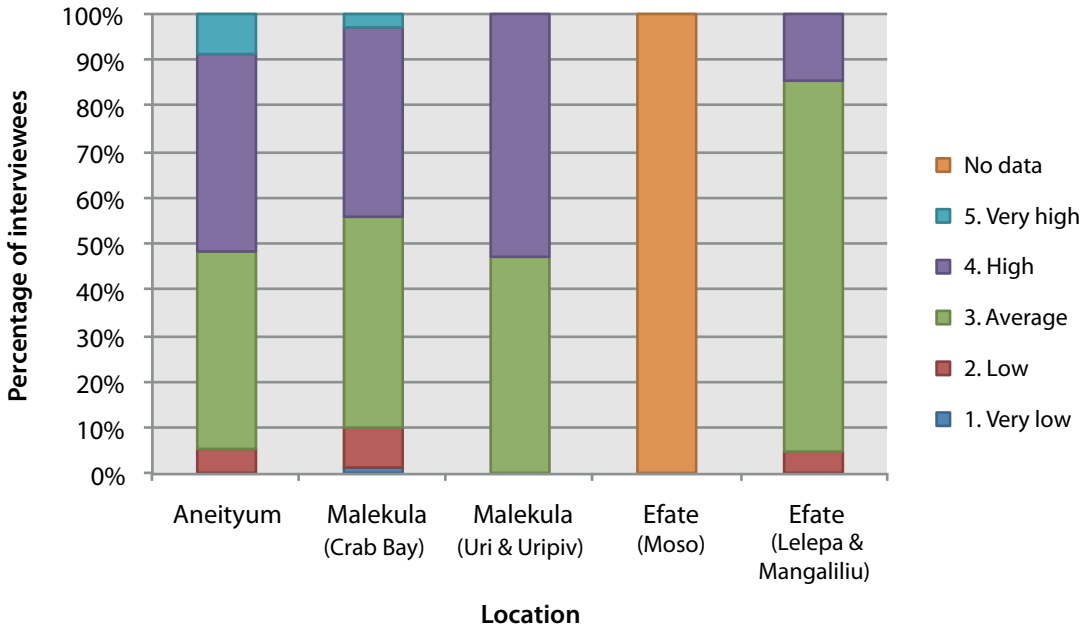

Figure 6. Willingness to participate in community activities.

7.1.4. Contribution to the community activities

More than 60% of respondents in Aneityum indicated a willingness to contribute both money and time to community activities (Table 22), which seems to indicate that respondents from here earn the highest monthly income of all target areas. On the other hand, approximately 70% of respondents in Crab Bay were not in favour of making a monetary contribution, although their monthly income is the second highest in the target areas, and 80% of interviewees in all target areas were unwilling to contribute time or labour.

Table 22. Willingness to contribute to community activities.

	Aneityum	Malekula		Efate
		Crab Bay	Uri and Uripiv	Moso	Lelepa and Mangaliliu
Money contribution					
Yes (%)	67.6	31.2	45.0		56.5
No (%)	32.4	68.8	55.0		43.5
Time/labour contribution					
Yes (%)	62.2	19.5	88.9		73.9
No (%)	37.8	80.5	11.1		26.1

Source: Project baseline survey
Note: For Moso, the data for this question are missing.

In Uri and Uripiv, about 90% of the people are willing to contribute time and labour for community activities (Table 22). The lowest income in the target areas might be the reason for the preference of time and labour contribution over money; 57% of respondents in Lelepa and 74% in Mangaliliu answered affirmatively to contributing both money and time.

It is noteworthy that Crab Bay respondents were negative about contributing both money and time to community activities; however, they might not have been receptive to the survey because their main livelihood is agriculture, not fisheries.

7.1.5. Pursuit of community interest and personal interest

Figure 7 shows perceptions on pursuit of community interest compared with personal interest. Aneityum had the highest percentage of respondents who emphasised community interest. The ratios of those who chose community interest and personal interest were the same. On the other hand, the ratios of people who want to pursue personal interest were highest in Uri and Uripiv. In Efate, nobody preferred community interest to personal interest.

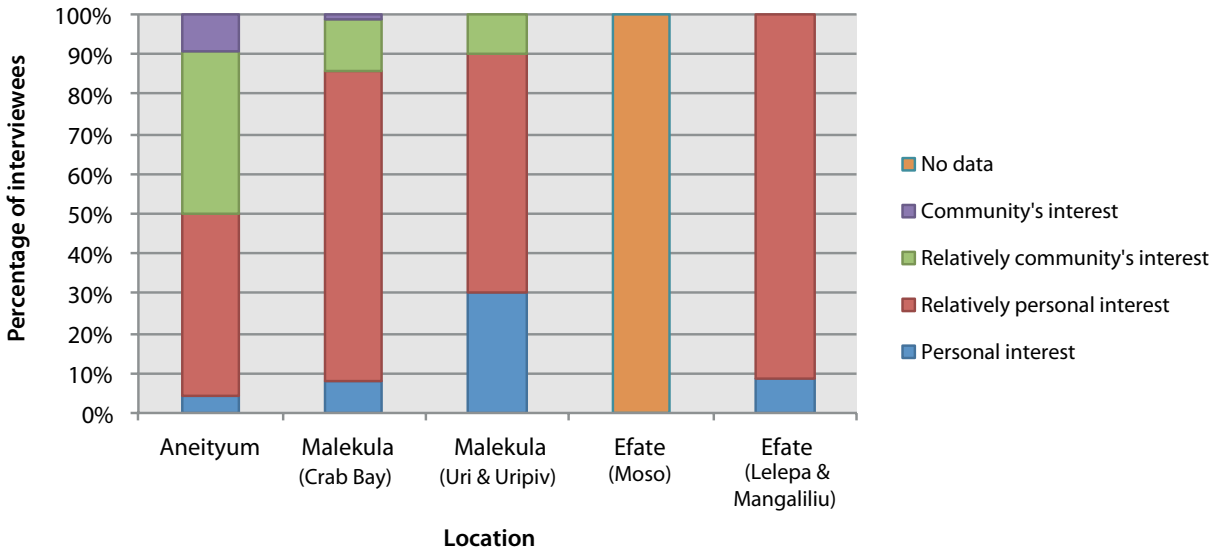

Figure 7. Priority on pursuit of community interest or personal interest.

Table 23. Cost of fishing operations (in VUV).

	Aneityum	Malekula	Mangaliliu	Lelepa	Tassiriki	Sunae	Average
Fuel	1,140	1,875	2,000	2,000	0	360	1,229
Lubricants	1,000	0	0	0	0	0	167
Battery	0	0	1,000	1,000	800	400	533
Fishing hooks	385	0	0	0	0	0	64
Bait	0	750	0	0	0	0	125
Transport	0	1,000	3,000	4,000	3,500	1,000	2,083
Market fee	0	0	0	0	400	400	133
Ice	0	0	1,000	1,000	1,000	300	550
Food and drink	0	0	400	400	0	0	133
Total	2,525	3,625	7,400	8,400	5,700	2,460	5,018

Source: Project baseline survey

Table 24. Livelihood condition in target communities.

	Aneityum		Malekula		Efate		Overall	
	#	(%)	#	(%)	#	(%)	#	(%)
Current livelihood condition								
Better than average	0	(0.0)	12	(75.0)	3	(75.0)	15	(65.2)
Average	3	(100.0)	4	(25.0)	1	(25.0)	8	(34.8)
Worse than average	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Total	**3**	**(100.0)**	**16**	**(100.0)**	**4**	**(100.0)**	**23**	**(100.0)**
Change in livelihood condition								
Improved	3	(100.0)	14	(87.5)	2	(50.0)	19	(82.6)
Unchanged	0	(0.0)	0	(0.0)	2	(50.0)	2	(8.7)
Worsened	0	(0.0)	2	(12.5)	0	(0.0)	2	(8.7)
Total	**3**	**(100.0)**	**16**	**(100.0)**	**4**	**(100.0)**	**23**	**(100.0)**

Source: Project baseline survey

7.1.6. Purposes and proportion of production (subsistence vs commercial)

The survey revealed that the purpose of production varies significantly, depending on species. Crustaceans (lobster) and large pelagic fish (e.g. tuna, wahoo, marlin) are sold to generate cash income, whereas, small pelagic fish (such as sardine and bigeye scad) and shellfish (giant clams) tend to be consumed in the producing household. Small pelagic fish are also used as bait (see above, Tables 13–19).

7.1.7. Economic performance of fishing operations

Table 23 shows the cost of fishing operations for each target site. The main costs are fuel, engine lubricants and transport, and the average total operational cost is approximately VUV 5,000.[9] Fish prices vary from around VUV 300–1,000/kg, depending on the site and species. A single fishing operation needs to yield 5–19 kg of fish just to cover operational costs. However, only a very small percentage of households have their own outboard engine (see Table 12). Tables 14–18 show that community members catch some species mainly for household consumption. In such cases no transport costs are incurred.

7.2. Types of livelihood engaged in by fishing communities

7.2.1. Livelihood condition in target communities

About 60% of respondents in the target communities said that their "livelihood condition" is above average, whereas about 30% answered that their livelihood condition had remained at the average level. More than 80% felt that their livelihood condition had improved (Table 24).

[9] The rate of exchange for the ni-Vanuatu vatu (VUV) on 31 August 2012 was VUV 100.00 = AUD 1.06 or USD 1.08.

In the target communities, men generally ranked agriculture as their first priority economic activity, and fisheries as second (Table 25). However, in the Efate area fisheries were ranked as being more important than agriculture, and in the Aneityum area tourism was ranked second, following agriculture. For women, agriculture tends to be the primary economic activity in the target communities, and they ranked fisheries lower than men did. In Efate, handicraft/catering is the second most important economic activity for women after agriculture, and in the Aneityum area, tourism is the most important economic activity for women.

Table 26 shows the main products of the agriculture, fisheries and livestock sectors in the target communities. (For fisheries products see Appendix 2.) Each target community produces various primary sector products, and although there is a range of products, there is little difference among the target areas. In recent years the production of agricultural, fisheries and livestock products has increased in most communities.

7.2.2. Income from fishing and other activities

Table 27 shows average monthly income by economic activity and target area. With approximately VUV 108,500, Aneityum has the highest monthly average income among the target areas. Its main income is derived from tourism, which amounts to approximately VUV 27,500 per month. The income of

Table 25. Priority on economic activities by gender in target areas.

	Average score			
Economic activities	Aneityum	Malekula	Efate	Overall
Men				
Agriculture	2.00	2.88	2.00	2.61
Fisheries	**1.00**	**1.00**	**2.50**	**1.26**
Forestry	1.00		1.00	0.30
Tourism	1.67		0.50	0.30
Livestock	0.33	0.25		0.22
Marketing		0.13		0.09
Women				
Agriculture	2.00	2.25	2.00	2.17
Marketing		1.50	0.50	1.13
Handicraft/Catering	0.33	0.31	1.75	0.57
Fisheries	**0.33**	**0.44**	**0.50**	**0.43**
Tourism	3.00			0.39
Livestock	0.33	0.25		0.22
Church		0.13		0.17
Forestry			0.25	0.04

Source: Project baseline survey
Note: The ranks of economic activities are quantified as scores as follows: First-ranked economic activity: 3.0; second-ranked, 2.0; third-ranked, 1.0

Table 26. Main agricultural and livestock products in target areas.

	Aneityum	**Malekula**	**Efate**
Agriculture	Vegetables, kava, taro, vanilla, coffee, pepper	Vegetables, taro, manioc, yam, banana, coconuts, fuelwood, copra, cocoa	Vegetables, manioc, yam, banana, coconuts, fuelwood
Livestock	Pigs, chicken, cows	Pigs, chickens, foals, cows, goats	Pigs, chickens, foals, cows

Source: Project baseline survey

Table 27. Average monthly income by region.

	Aneityum		**Malekula**				**Efate**			
			Crab Bay		Uri and Uripiv		Moso		Lelepa and Mangaliliu	
	vatu	(%)	vatu	(%)	vatu	(%)	vatu	(%)	vatu	(%)
Fisheries	13,179	(12.1)	8,914	(9.2)	3,412	(17.0)	9,100	(22.9)	11,190	(21.5)
Agriculture	12,080	(11.1)	17,235	(17.8)	2,938	(14.7)	8,318	(20.9)	5,100	(9.8)
Livestock	9,125	(8.4)	8,583	(8.9)					7,250	(13.9)
Tourism	27,467	(25.3)					8,750	(22.0)	14,125	(27.1)
Remittance	10,000	(9.2)	37,333	(38.6)						
Others	36,667	(33.8)	24,692	(25.5)	13,667	(68.3)	13,600	(34.2)	14,375	(27.6)
Total	108,518	(100.0)	96,757	(100.0)	20,017	(100.0)	39,768	(100.0)	52,040	(100.0)

Note: The vatu (VUV) 100.00 = AUD 1.06 or USD 1.08 (31 August 2012)

approximately VUV 36,500 in the "other" category is composed mainly of wages related to public service, and sales of boat fuel.

Crab Bay recorded the second highest monthly income at approximately VUV 97,000, although about 65% of this is categorised as "remittance" and "other." According to discussions with Amal-Crab Bay MPA committee members, these are mostly wages earned by working in plantations. Agriculture is the other main source of livelihood in Crab Bay, based mainly on coconut and cacao. In contrast, only a few communities depend on fisheries. As shown in Figure 8, income from fisheries is relatively important in Barrick and TFC.

The monthly income of villagers in Uri and Uripiv is the lowest among the target areas, and is less than 20% of that of Aneityum. Almost 70% of the total monthly income is categorised as "other" because one respondent classified their spouse's VUV 58,000/month income as "other." In Uri and Uripiv, "other" income sources consist mainly of salaries received by civil servants or shopkeepers. If this amount is excluded, the average monthly income in Uri and Uripiv as a whole is approximately VUV 11,000. Given this low cash income, livelihoods in Uri and Uripiv exist at a subsistence economic level.

Livelihoods in Moso are similar to those of Lelepa and Mangaliliu. However, the people of Lelepa and Mangaliliu are engaged in livestock raising, and their monthly income is approximately VUV 7,000. In Lelepa and Mangaliliu the portion of income derived from agriculture is less than that of Moso. In neither area do people rely on remittances, and the income categorised as "other" comes mainly from the sale of fuelwood. As shown in Figure 8, tourism is a key means of livelihood in Efate, which is close to Port Vila, the capital.

7.2.3. Seasonality of fishing and other livelihoods

As shown in the fish calendars (Appendix 2), fishing activities in the target areas differ by predominant species as well as according to climate and marine environmental factors such as tide. In all areas, fishing activities generally become more frequent and varied from May to September. In Aneityum as well, during the period May–November, fishing peaks for particular species. For example, octopus is caught only from May through July, although it occurs throughout the year in other areas. On the other hand, from December to April or May, only half of the species in the area can be found, although the remainder are available all year. The variety of species found in Tassiriki and Mangaliliu (Efate) is less than that of Aneityum. However, the seasonal trend of fishing activities is similar to that of Aneityum, although the locations where these fishing methods are practiced differ by island. From June to September, all species that occur in those areas are targeted. Winter in Lelepa — July through

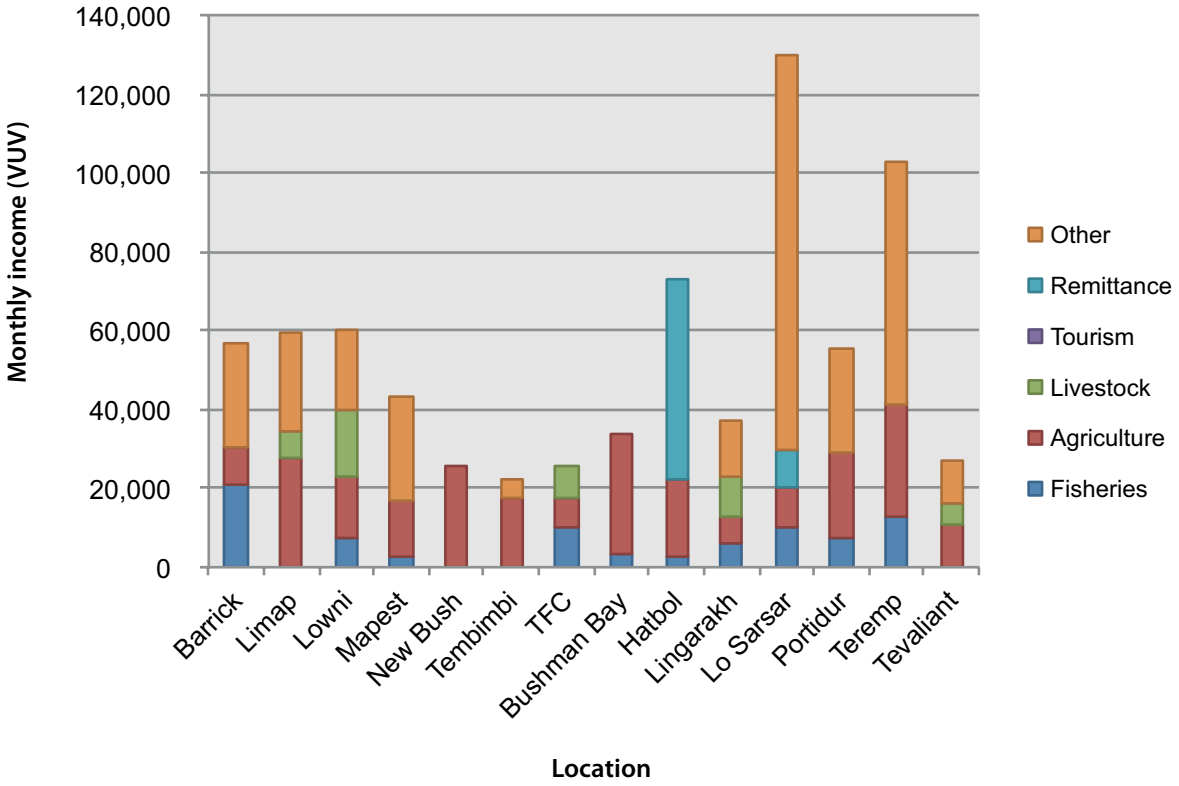

Figure 8. Components of average monthly income in Crab Bay.

September — is the peak fishing season for small pelagic fish, particularly sardines.

Many species occur over the course of a year in Sunae and Malekula without identifiable peaks for fishing. However, yellowfin tuna and skipjack tuna occur only from March through May in Malekula.

In addition to fishing, most people in the target communities engage in agriculture, producing mostly taro, cassava and banana. Except for Crab Bay, where agricultural production is the main livelihood activity, farming is for household subsistence. The seasons for agricultural and fisheries activities are not clearly distinguished in any of the target communities.

8. Awareness of the importance of coastal resource management

8.1. Level of awareness by community

The overall trend of each community regarding its perception with respect to CBCRM is shown in Table 28. (The values in the table indicate the average score for each question; the higher the average score, the more positive the perception.) The results for Aneityum are contrary to those of Crab Bay. Many respondents in both regions recognise an increase of resources in coastal areas. However, their perception regarding CBCRM is nearly diametrically opposite, with most respondents in Aneityum having relatively negative perceptions, whereas those in Crab Bay are more positive.

A CBCRM plan establishes rules and regulations for the use of fisheries resources, including a prohibition on fishing within a community MPA. It is important to identify the degree of understanding of community members in the target areas regarding resource use rules stipulated in resource management plans. This should make it possible to adopt appropriate strategy for raising awareness.

Nearly 70% of respondents in Crab Bay (Malekula) answered that they "completely understand" the resource management plan. This is the highest percentage among all target areas. If those who responded "understand some" are included, almost 100% of respondents had at least some understanding of the resource management plan. (Only 1 respondent out of 124 in Crab Bay responded that he/she does "... not understand at all" the resource management plan.) In contrast, only 26% of interviewees in Uri and Uripiv, both of whom are members of the Resource Management Committee, replied that they "completely understand" the resource management plan. In Aneityum, 35% of respondents answered "do not understand at

Table 28. Trends in community members' recognition, interest and opinions on community-based coastal resource management.

	Aneityum	Malekula		Efate		Average
		Crab Bay	Uri and Uripiv	Moso	Lelepa and Mangalilu	
Recognition on the resource condition[1]	4.28	4.76	3.48	1.75	3.19	3.49
Level of understanding of the Resource Management Plan[2]	2.16	3.51	2.91	2.33	3.06	2.80
Opinion regarding the Resource Management Plan[3]	3.46	3.84	3.41	3.97	3.54	3.64
Frequency of participation in CBCRM[4]	1.81	1.96	2.15	1.09	2.31	1.86
Compliance with MPA[5]	3.68	4.59	4.09	4.41	4.13	4.18
Change in fishing activities[6]	1.87	1.74	2.00	1.42	1.97	1.80
Opinions on MPA[7]	2.16	2.90	2.43	2.45	2.46	2.48

Source: Project baseline survey
Note: The figures in the table indicate the average score for each question; the higher the average score, the more positive the perception. These values are calculated based on the following answers:
[1] 1: Still much decreased; 2: Somewhat decreased; 3: Remained the same; 4: Somewhat increased; 5: Much increased
[2] 1: Do not understand at all; 2: Understand a little; 3: Somewhat understand; 4: Completely understand
[3] 1: Not appropriate; 2: A little appropriate; 3: Somewhat appropriate; 4: Very appropriate
[4] 1: None; 2: Once or twice; 3: Three to four times; 4: More than five times
[5] 1: The entire community fails to comply; 2: The majority of the community members do not comply; 3: About a half of the community members comply; 4: The majority of the community members comply; 5: The entire community complies
[6] 1: No change; 2: Somewhat reduced
[7] 1: I do not need the taboo area; 2: Partial openings should be allowed; 3: Taboo areas should be protected continuously

all" when asked about the resource management plan. On Efate, 18% of respondents in Moso and 3% in Lelepa and Mangaliliu said that they "do not understand at all" the resource management plan (Fig. 9). These results must be analysed, taking into account the differences by community, gender and age, and then reflected in the review of the existing resource management plan.

Overall, most respondents indicated that they agree with the existing resource management plan. However, there are differences among communities. More than 85% of respondents from Crab Bay and from Moso, answered that they "very much" appreciate the existing resource management plan. Elsewhere, as in Aneityum, Uri and Uripiv, Lelepa and Mangaliliu, 26–44% of interviewees responded that they appreciate it, and a small percentage of the interviewees responded that they do not appreciate it. Negative opinions were expressed only in Lelepa. For reviewing the existing resource management plan, it is important to analyse these negative opinions (Fig. 10).

Although current resource management activities are limited to relatively simple ones, such as meetings and cleaning beaches, the frequency of participation may indicate community members'

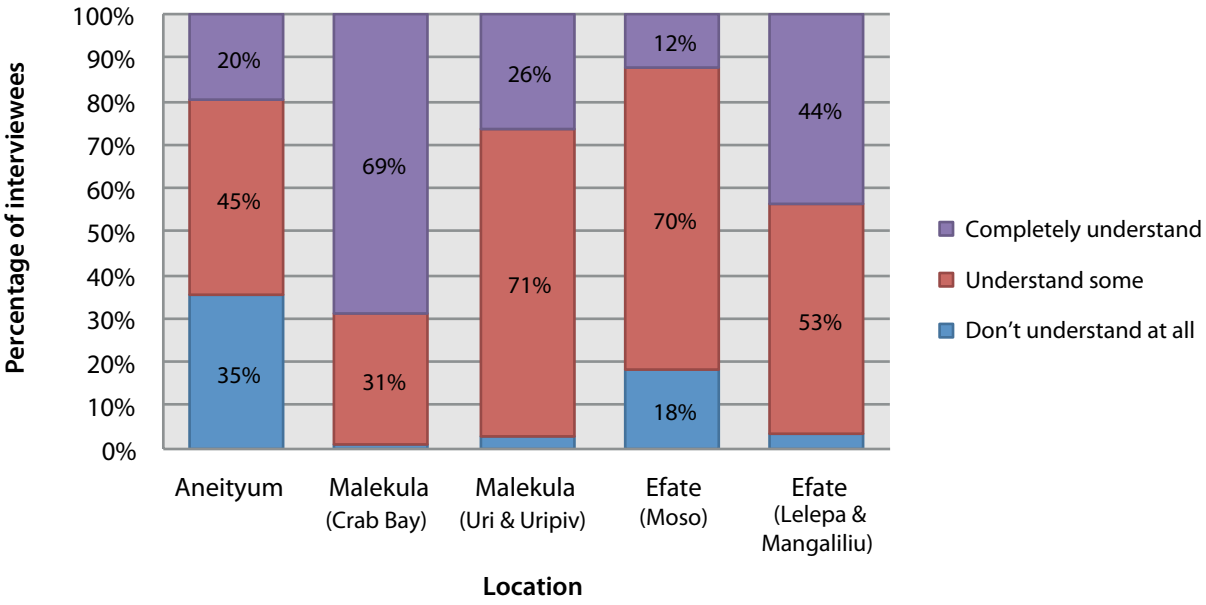

Figure 9. Level of understanding of the Resource Management Plan by community.

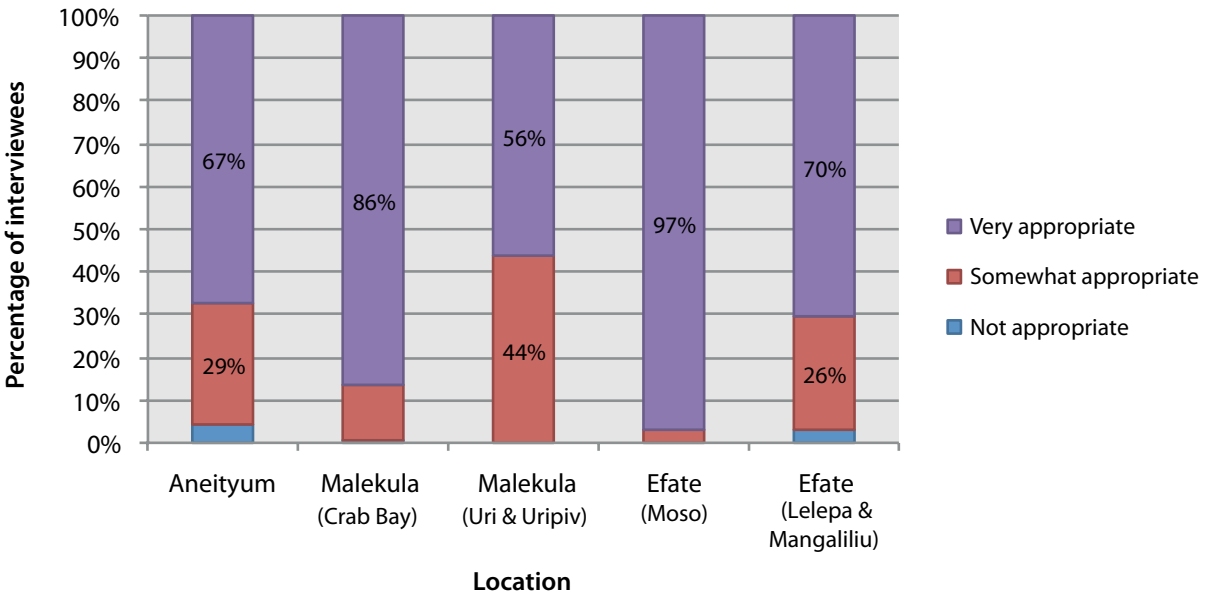

Figure 10. Opinions on the Resource Management Plan by community.

interest in resource management. About 44% of respondents in Lelepa and Mangaliliu, and 9% in Moso answered that they have participated in resource management activities more than three times per year. These represent the highest and lowest percentages among the communities surveyed (Fig. 11).

Nearly 70% of respondents in Crab Bay and 56% in Moso answered that the whole community wants to keep the resource management plan, which indicates a relatively high level of compliance. In contrast, only 11% of respondents in Aneityum answered that the whole community wants to keep the resource management plan, indicating a potentially low level of compliance (Fig. 11).

In Crab Bay, 91% of respondents answered that the MPA (taboo area) should be protected. Similar percentages were found percentage in Uri and Uripiv (Malekula), and in Moso, Lelepa and Mangaliliu (Efate), who said that MPA should be protected and it should be opened partially (e.g. for a certain period of time, for a certain area, or for certain species). In Aneityum, 84% of respondents answered that the MPA should be opened partially (Fig. 12). To strengthen CBCRM, the differences among communities in terms of resource condition, opinions

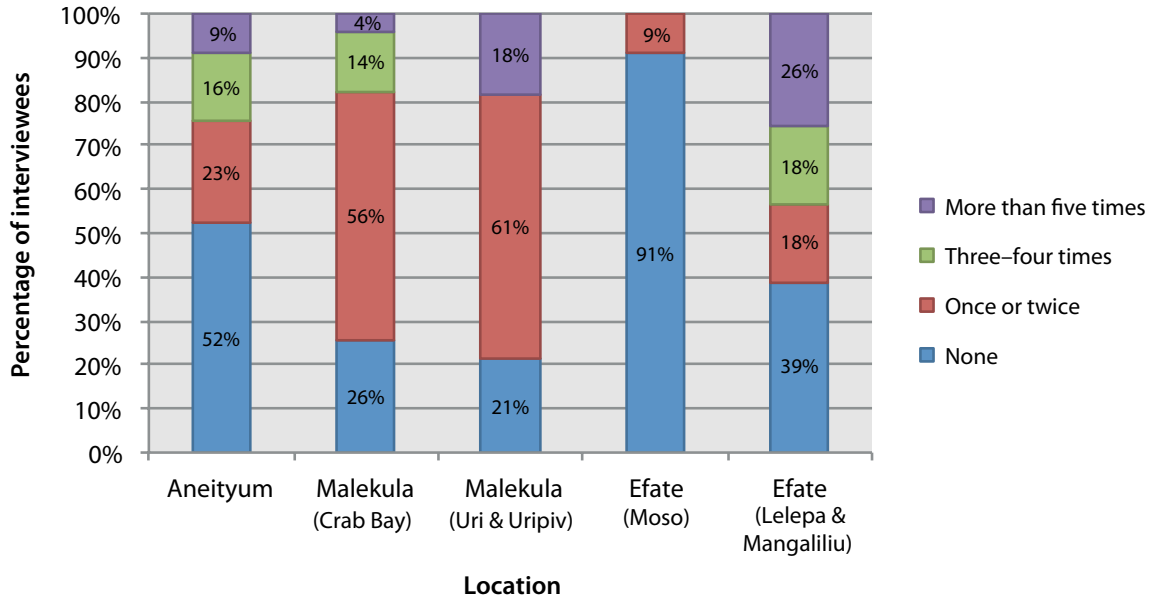

Figure 11. Frequency of participation in community-based coastal resource management by community in last year.

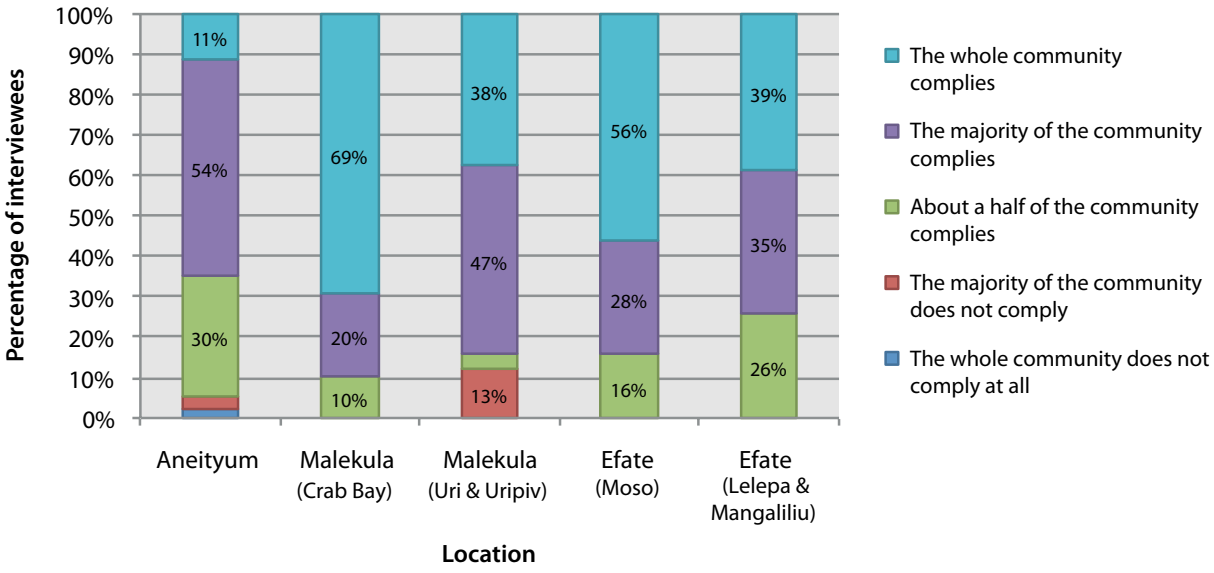

Figure 12. Compliance with marine protected areas by community.

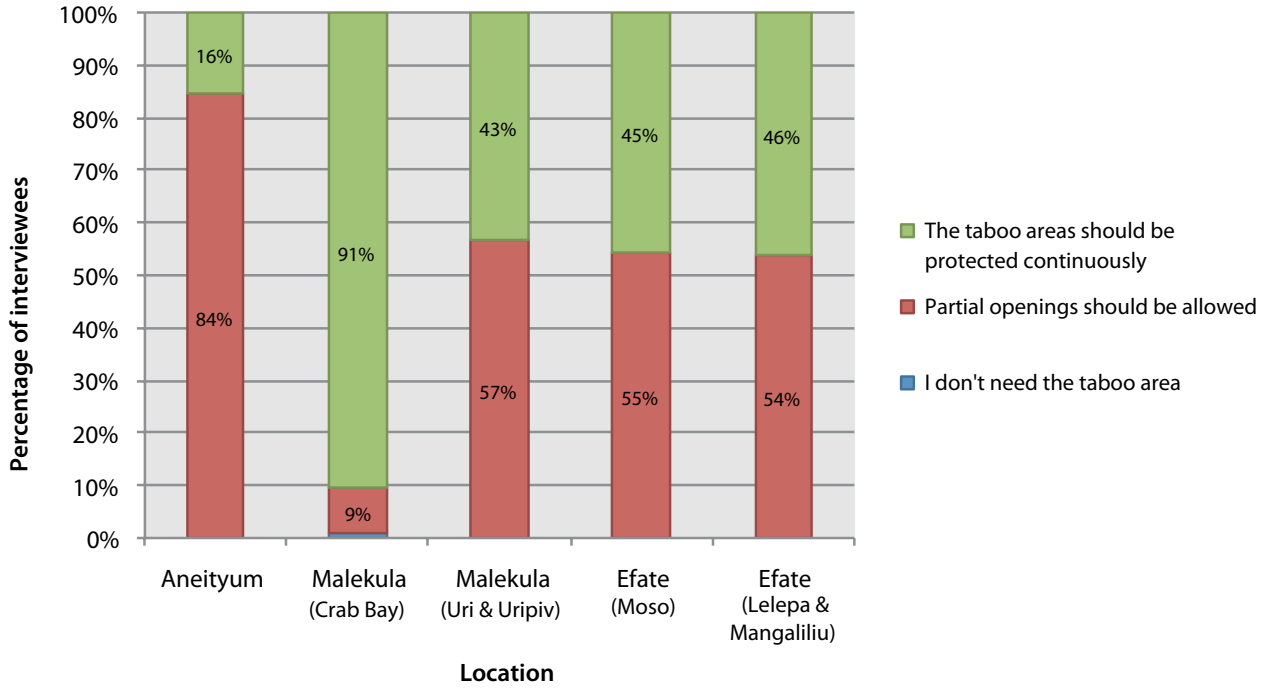

Figure 13. Opinions on marine protected areas by community.

of community members, and strength of existing organisations should all be taken into account. In Aneityum, where fisheries resources remain healthy and where the target community is well organised, it may be appropriate to change CBCRM activities from a total ban on fishing within the MPA to allowing some use of resources (Fig. 13).

8.2. Level of awareness of CBCRM by different social groups

Because the baseline survey did not differentiate the level of awareness by different social groups, it was necessary to conduct an additional questionnaire survey, which is summarised in Table 29.

There is a marked gap between decision makers and non-decision makers regarding their understanding of the CBCRM plan, with the latter tending to have a poorer understanding of it. Most interviewees (non-decision makers) in Aneityum do not understand the plan, whereas most of those (also non-decision makers) in Malekula responded that they understood only the taboo area, but not the entire plan. Regardless of this gap in understanding, both decision makers and non-decision makers seem to consistently appreciate and accept the CBCRM plan and the change in fishing activities that it requires.

In terms of the level of understanding of the resource management plan by gender, 27% of male and 32% of female respondents were clearly negative towards the plan, whereas 42% of male and 20% of female respondents answered that they "completely understand" the plan (Fig. 14).

Compared with other groups, those 30–45 years old hold more negative opinions on the existing resource management plan (Fig. 15). This trend is especially clear in Aneityum (Fig. 16), Lelepa and Mangaliliu (Fig. 17). In Uri and Uripiv, however, younger age groups have more negative opinions (Fig. 18).

This could be because the 30–45 age group needs more cash income and food for their families than do other groups, thus it is important to provide alternative sources of income or food along with resource management. Younger age groups are critical for resource management in the future, so awareness-raising activities may need to be conducted in cooperation with youth groups, which exist in almost all communities.

9. Institutional structure

Existing management bodies and their functions, local processes of consultation and decision-making (consensus building), social systems and organisations to support CBCRM, and supporting services and activities provided by public institutions (VFD and others), donors and NGOs are summarised for each site in Tables 30–37.

Table 29. Level of awareness of community-based coastal resource management (CBCRM) by social group.

	Aneityum		Malekula				Efate							
			Crab Bay		Uri and Uripiv		Mangaliliu		Lelepa		Tassiriki		Sunae	
	Decision maker	Non decision maker	Decision maker	Non decision maker	Decision maker	Non decision maker	Decision maker	Non decision maker	Decision maker	Non decision maker	Decision maker	Non decision maker	Decision maker	Non decision maker
	5	20	5	25	5	25	6	10	5	10			5	10
Understanding of CBCRM plan														
Yes	4	2	4	16	4	9	4	8	5	10			5	9
understand only taboo	0	3	1	9	1	16	0	0	0	0			0	1
No	1	15	0	0	0	0	2	2	0	0			0	0
Acceptance of CBCRM plan														
Yes	5	19	5	25	5	23	3	10	5	10			5	10
No	0	1	0	0	0	2	3	0	0	0			0	0
impossible to decide	0	0	0	0	0	0	0	0	0	0			0	0
Appreciation of CBCRM plan														
Yes	5	19	5	23	5	25	4	10	5	9			5	10
Yes, a little	0	0	0	0	0	0	2	0	0	1			0	0
No	0	1	0	2	0	0	0	0	0	0			0	0
Change in fishing activities														
avoid catching small size fish	2	3	4	14	0	4	0	0	0	0			0	1
avoid catching certain kinds of fish	2	13	0	0	4	11	0	0	4	9			5	9
reduce the fishing time	1	1	0	11	1	0	3	5	1	1			0	0
reduce the amount of catch	0	1	1	0	0	10	2	5	0	0			0	0
others	0	2	0	0	0	0	1	0	0	0			0	0
Desire to keep taboo														
should be protected continuously	2	7	5	20	1	11	4	8	5	8			4	9
should be opened at certain periods	3	13	0	0	4	14	2	2	0	1			1	1
a part of taboo should be opened	0	0	0	0	0	0	0	0	0	1			1	1

Source: Project baseline survey

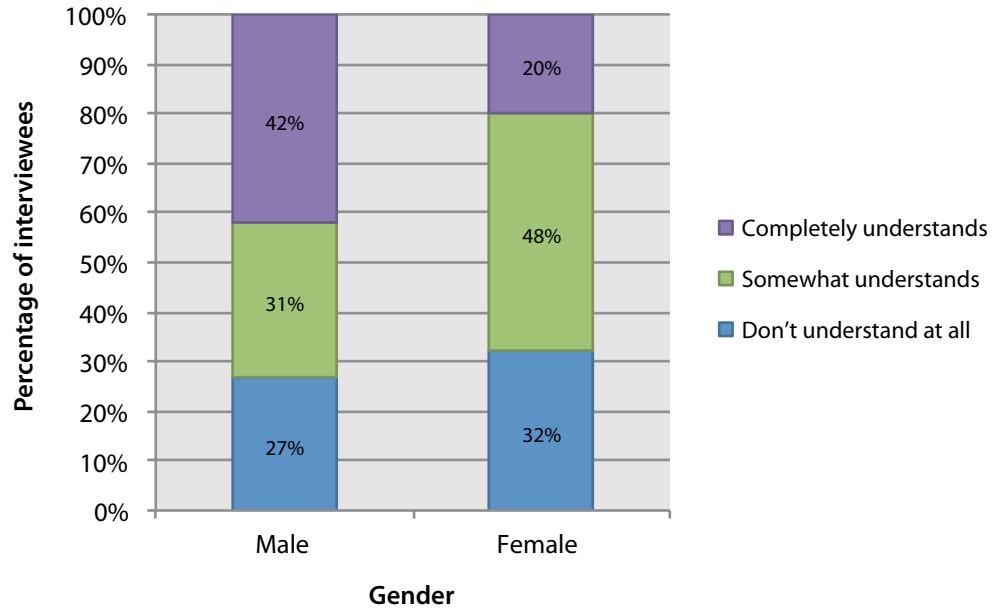

Figure 14. Level of understanding of the Resource Management Plan by gender.

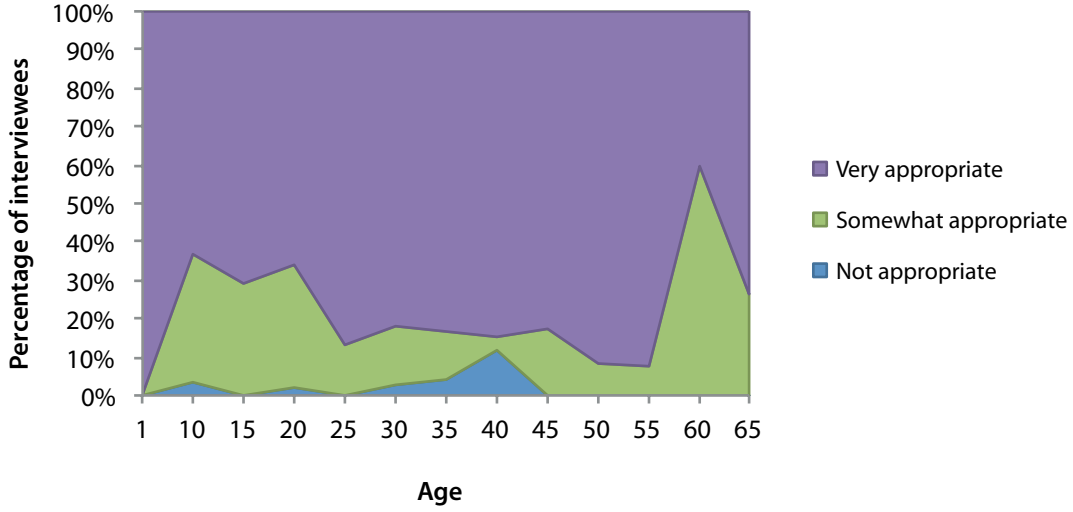

Figure 15. Opinions on the Resource Management Plan by age (all regions combined).

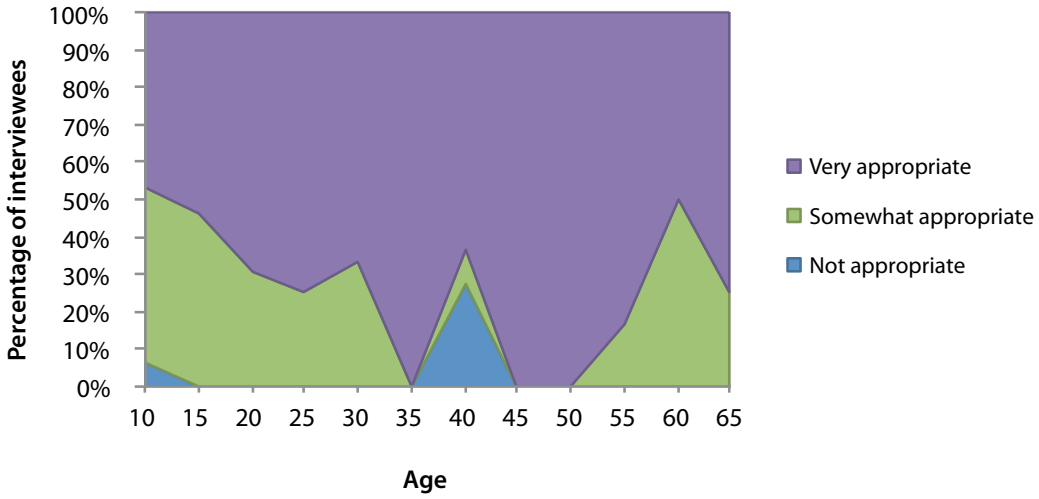

Figure 16. Opinions on the Resource Management Plan by age (Aneityum).

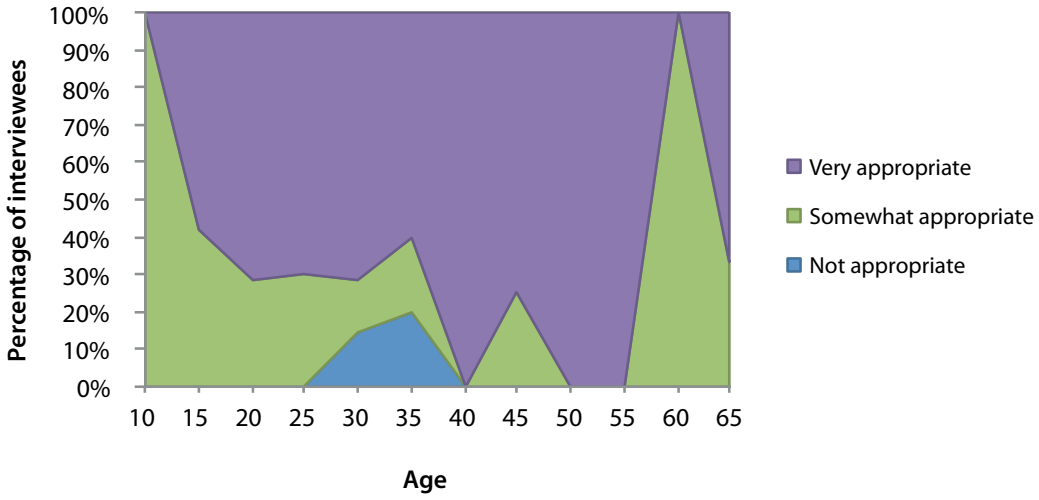

Figure 17. Opinions on the Resource Management Plan by age (Lelepa and Mangaliliu).

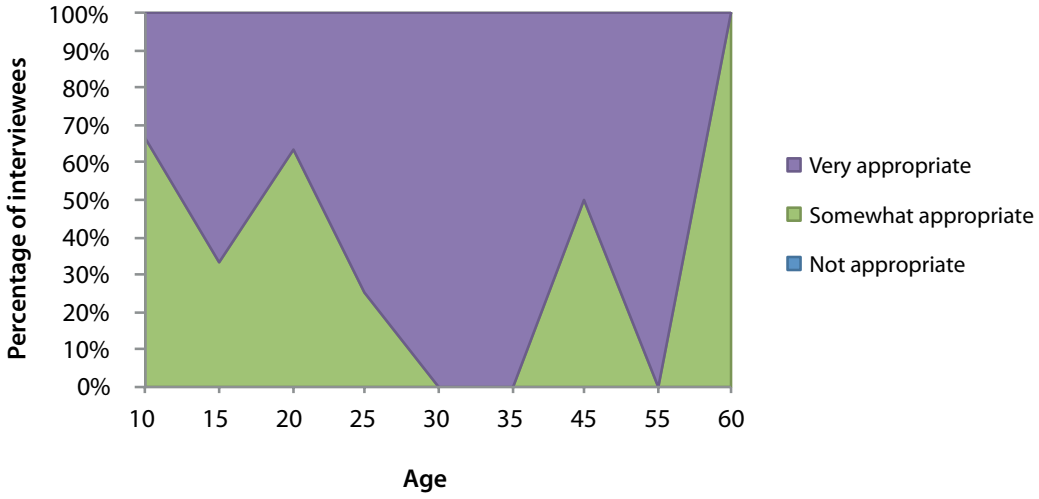

Figure 18. Opinions on the Resource Management Plan by age (Uri and Uripiv).

Table 30. Institutional arrangements in Aneityum.

Resource management (access) committee/ Taboo area committee	
Members	Chairman (1), Vice chairman (1), Secretary (1), Treasurer (1)
Founded in:	2007 (MPA was set in 2001)
No. of members:	6 members (6 tribes)
Yearly budget	Mystery Island Tourism Association offers operational fund (VUV 50–60,000 every month)
Current activities and their frequency	Irregular meeting (depend on agenda) Reef check (twice a year) Coral planting Fish feeding Giant clam and trochus farming Monitoring in marine protected area (MPA) and around the areas Awareness of coastal resource in community Tours in MPA for tourists
Supporting organisations and systems	Wan Smol Bag Theatre FSPV/FSPI (Foundation for People for South Pacific Vanuatu International) French Institute of Research for Development, Vanuatu Fisheries Department, Department of Forestry, Japan International Cooperation Agency (Grace of the Sea)
Remarks	
Decision-making and announcement process	
The committee meeting makes any decisions regarding operation and activities. Usual three staff members do not attend the committee meeting. They work according to the decision of the committee meeting. The committee comprises the representatives of only 6 tribes, even though there are 15 tribes living in the Analcauhat area.	

Table 31. Institutional arrangements in Malekula (Crab Bay).

Resource management committee	
Members	Total 18 members One representative each from 16 communities. Plus one extra from Uripiv and Lingarakh Board members consist of the Chair (Lingarakh rep.), Secretary (Barrick rep.), Executive (Portindur rep.) plus Mr Kevin from VFD.
Founded in:	2002
No. of members:	Total 18 members
Yearly budget	VUV 300,000/year planned in 2012. However, income (by fundraising) has not been realized as planned. The committee has VUV 114,000 deposit.
Current activities and their frequency	Education Clean up – this year education and clean-up activities do not take place because there is no fund from the provincial government. Data collection on crab – every month data is collected. Reef check (finished) – done in 2008 but not realised since then. Kava night – realised only during MESCAR project for 2 weeks. Not realized since then. Turtle monitoring – there are turtle monitors but they don't seem to be active. Regular meeting – it used to be every month but reduced to 4 times in 2011, and 4 times (planned) in 2012.
Supporting organisations and systems	Department of Fisheries, Department of Forestry, Environmental department, Malampa Provincial government, Wan Smol Bag, Japan International Cooperation Agency, TEVUV (Technical Vocational Education Training), Fish market in Lakatoro
Remarks	Main concern before was monitoring. Now it is socioeconomic development and awareness raising. The committee wants to build water system with bathroom and toilet in Crab Bay. Water is available in MAPEST. From MAPEST to Crab Bay the distance is 3 km. The cost for installing the water pipe is around VUV 1 million.
Decision-making and announcement process	
1. Executive makes agenda and calls the meeting. 2. In the meeting, participants discuss the agenda (18 committee members). 3. After the discussion, chairman makes decision. 4. Chairman confirms the decision with all the members (especially those who were absent in the meeting).	

Table 32. Institutional arrangements in Malekula (Uri).

Resource management (access) committee / Taboo area committee	
Members	4 in each committee
Founded in:	1994
No. of members:	4 in each committee
Yearly budget	Up to 10,000
Current activities and their frequency	Monitoring in every 2 years Tour guide for yachts (4–5 yachts per year) Fee collection for fishing in the access area, VUV 500–1,000 per full day fishing for selling fish. If it is only for self-consumption, no fee.
Supporting organisations and systems	Japan International Cooperation Agency, Vanuatu Fisheries Department, Turtle monitor
Remarks	
Decision-making and announcement process	
1. Discussion within the committee 2. Chairman decides based on the discussion 3. Chairman announces the decision to the community	

Table 33. Institutional arrangements in Malekula (Uripiv).

Resource management committee	
Members	No resource management committee exists in Uripiv
Founded in:	
No. of members:	
Yearly budget	
Current activities and their frequency	Trochus and green snail release (conducted by Grace of the Sea Phase II)
Supporting organisations and systems	Japan International Cooperation Agency, Vanuatu Fisheries Department
Remarks	
Decision-making and announcement process	
Owner's family members decides by themselves on the use of the reef (such as taboo or fines against the violation of taboo)	

Table 34. Institutional arrangements in Mangaliliu.

Resource management committee	
Members	President (1), Secretary (1), Treasurer (1), Members (3)
Founded in:	2006
No. of members:	6
Yearly budget	None
Current activities	i) Resource monitoring (mainly shell fish) ii) Collaboration with Vanuatu Fisheries Department (VFD)
Frequency of the activities	i) not very active, irregular ii) only when there is any projects or specific activities
Supporting organisations and systems	VFD, Japan International Cooperation Agency, Peace Corps, Wan Smol Bag, Vanua Tai (turtle monitor), French Institute of Research for Development
Remarks	Resource management committee considers that • legal support is needed for marine protected area (MPA); • management is necessary for not only current target species but also other species; • resources are decreasing outside MPA; • development of pelagic/deep-sea fisheries is necessary.
Decision-making and announcement process	
The issues that families cannot solve and that need decision made by whole community are dealt with as follows (e.g. land issue, construction of public buildings): 1. Community organisations (e.e. resource management committee) submit the request to chief council. 2. Chief Council discusses the agendas submitted from community organisations, or any other agendas that Chief Council considers appropriate, and makes decision. Any community members can participate into the discussion of the Chief Council as observers, and express their opinions. 3. The decision made by the Chief Council will be announced to the whole community through the head of family.	

Table 35. Institutional arrangements in Lelepa.

Resource management committee	
Members	Not functioning right now. Used to have 3 members from Lelepa and another 3 members from Mangaliliu
Founded in:	2007
No. of members:	Use do have 3 members from Lelepa and another 3 members from Mangaliliu
Yearly budget	No budget
Current activities and their frequency	Not functioning right now.
Supporting organisations and systems	Vanuatu Fisheries Department, Japan International Cooperation Agency, Wan Smol Bag (*vanua-tai*)
Remarks	
Decision-making and announcement process	
1. General meeting in the community (all organisations in the community participate) 2. Agree after the discussion 3. Chief confirm	

Table 36. Institutional arrangements in Tassiriki.

Resource management committee	
Members	No committee for fisheries resource management, only Terry Fictor
Founded in:	2005
No. of members:	1 member
Yearly budget	No budget
Current activities and their frequency	Monitoring of the giant clam (*Tridacna gigas*) Clean-up campaign
Supporting organisations and systems	Japan International Cooperation Agency, Tamarana guesthouse (help cleaning), School children (clean up beach), Wan Smol Bag (turle monitor)
Remarks	Mr Fictor considers that it is necessary to upgrade the taboo area into marine protected area (legalised)
Decision-making and announcement process	
1. Whole community share the idea, and discuss. 2. Chief takes the decision (chief is the owner of the part of taboo area).	

Table 37. Institutional arrangements in Sunae.

Marine resource management committee	
Members	3: Derek French (chairman), Lauta Joel and Thompson Tamata
Founded in:	2006 Japan International Cooperation Agency (JICA) phase 1)
No. of members:	4
Yearly budget	0
Current activities and their frequency	Attend meeting for JICA (Grace of the Sea) Establish taboo area and monitor Respect fisheries law Take care of *Tridacna gigas* Ocean nursery for *Tridacna maxima* Attend other meeting related with fisheries
Supporting organisations and systems	JICA, Tasi Vanua (turtle monitor), Vanuatu Fisheries Department,
Remarks	
Decision-making and announcement process	
1. Derek French makes the proposal with the marine committee 2. Proposal is taken to the Chief Council 3. Proposal is discussed in whole community 4. Chairman of the Chief Council takes the decision 5. Reef owner: chief (whole community is one family, united)	

There is a limited number of cooperatives and associations for the primary sector in the target communities (Table 38). In the Efate area, there is only one agriculture association, located in Lelepa. In the Malekula area there are agricultural associations in several inland communities. However, only the fisheries cooperative for Uri and Uripiv communities is located in the area. In Aneityum, there is no cooperative for either the agriculture or fisheries sectors. There is only a livestock association in the Port Patrick community.

9.1. Current coastal resource management measures

Existing resource management and enforcement measures for each target site are shown in Tables 39–41.

More than 85% of members of the 14 communities near the Crab Bay MPA (Malekula) and those in Aneityum recognise that fisheries resources in their MPAs have increased since implementation

Table 38: Existence of cooperative associations in primary sector in target areas.

	Aneityum	Malekula	Efate	Overall
Number of target communities	3	16	4	23
Community Development Committee	1	2	1	4
Cooperative	2	4	1	7
Health Committee	3	7	3	13
Parent–Teacher Association	3	3	2	8
Youth Group	3	13	4	20
Women's Group	3	11	4	18
Sport Group	3	5	3	11
Cultural Group	3	0	2	5
Others (Church, Vanwood)	0	2	0	2

Table 39. Existing resource management rules and enforcement measures in Aneityum.

Target site	Mystery Island	Aneityum Island as a whole	Aneityum Island as a whole
Target species	All species	Lobster	Trochus
Rule	Protect all species	Minimum catch size: 25 cm. Smaller lobsters should be released.	Minimum and maximum catch size (9–13cm)
Enforcement measures		Marine protected area committee collects the lobster catch data and checks the size.	Marine protected area committee collects the data.

Source: Project baseline survey

Table 40. Existing resource management rules and enforcement measures in Malekula.

Target site	Crab Bay	Crab Bay	Uri	Uripiv
Target species	Land crab	All species	All species	
Rule	i) Taboo and access area ii) Minimum catch size (4 fingers) iii) closed season (Spawning season: December–January) iv) Monthly sales data in the market	Taboo and access area	Taboo and access area	
Enforcement measures	i) VUV 5,000 as fine. Monitoring by community ii) Check in the market iv) Committee asks women in the market	VUV 5,000 as fine. Monitored by community	VUV 15,000 fine	There is no need for the enforcement measures because everybody respects the taboo area.

Source: Project baseline survey

Table 41. Existing resource management rules and enforcement measures in Efate.

Target site	Mangaliliu		Lelepa	Tassiriki	Sunae
Target species	All species	Trochus, giant clams, green snail, and bubu shell	All species	All species	All species
Rule	Taboo area	Total ban	Taboo area	Taboo area	Taboo area
Enforcement measures	Maximum VUV 15,000–20,000 as fine. Monitored by the Village Council.		VUV 3,000 as fine. Monitored by Chiefs Council.	VUV 3,000 as fine. Monitored by community	Monitored by the community. Chiefs Council decides the penalty for violators.

Source: Project baseline survey

of CBCRM (Fig. 19). In contrast, only 48% of community members in Uri and Uripiv (Malekula), 47% in Lelepa and Mangaliliu (Efate) and 13% in Moso (Efate) found that fisheries resources had increased. Data from Malekula and Efate indicates a relatively wide gap between adjacent communities. (According to the survey, more community members in Mangaliliu recognise the resource increase than in Lelepa.) This recognition gap correlates with the perception of the effectiveness of the resource management plan, which is analysed below. This must be taken into account when reviewing existing resource management plans, to ensure community participation in resource management activities.

Except for those in Moso, most respondents answered that they had changed some of their bad fishing activities (e.g. stopped catching small fish) after the introduction of CBCRM. This indicates that CBCRM could change community members' behaviour (Fig. 20).

9.2. Important external factors: Access to the market and transport

9.2.1. Aneityum

Transport is limited in Aneityum. Several shipping companies operate between Tanna and Aneityum, but only once or twice per month. Air Vanuatu operates a regular airfreight service between Tanna and Aneityum every Tuesday and Saturday. However, the poor condition of the airfield sometimes prevents landing. At present, the Chief Committee in Aneityum limits the marketing of fisheries products to just within the island in order to ensure that local demand is met as well as to prevent overexploitation of fisheries resources.

Despite such difficulties, Aneityum receives many cruise ship tourists from Australia and New Zealand, with an estimated total number in the range of 25,000–70,000 each year. This estimate is based on data derived from interviews with local people in Aneityum. One cruise ship brings around 1,000–1,500 tourists, although not all of them go ashore. Assuming that 500–1,000 tourists land on Mystery Island, and 50–70 cruise ships visit Aneityum each year, the estimated total annual number of tourists ranges from 25,000 to 70,000. Their expenditure on local food and souvenirs creates a major market opportunity for Aneityum people.

9.2.2. Malekula (Crab Bay, Uri and Uripiv)

The 14 communities scattered around Crab Bay lack a significant local market because the number of households is only 3–52 per community, and totals only 338 for the entire area. Therefore, they send their products to Lakatoro, the main market on Malekula Island, which is about an hour away by public transportation or charter bus. However, in some remote communities people must walk to the main road to catch the transport, which makes access to the community difficult during periods of heavy rain.

Uri and Uripiv are small islands that are about 20 minutes from Lakatoro by boat. Many people commute from their island to Lakatoro because daily boat transport is available.

At present, the Malekula area receives few tourists. Cruise ships from Australia and New Zealand make regular visits to a location just north of Lakatoro, but this provide little benefit to communities in Crab Bay, Uri and Uripiv. Attractions for tourists would have to be created in order to market this area for tourism.

Access to Port Vila, Vanuatu's capital, is provided by a flight between Norsup (about 15–20 minutes from Lakatoro) and Port Vila that operates daily, except on Saturdays. There is also a regular cargo ship schedule.

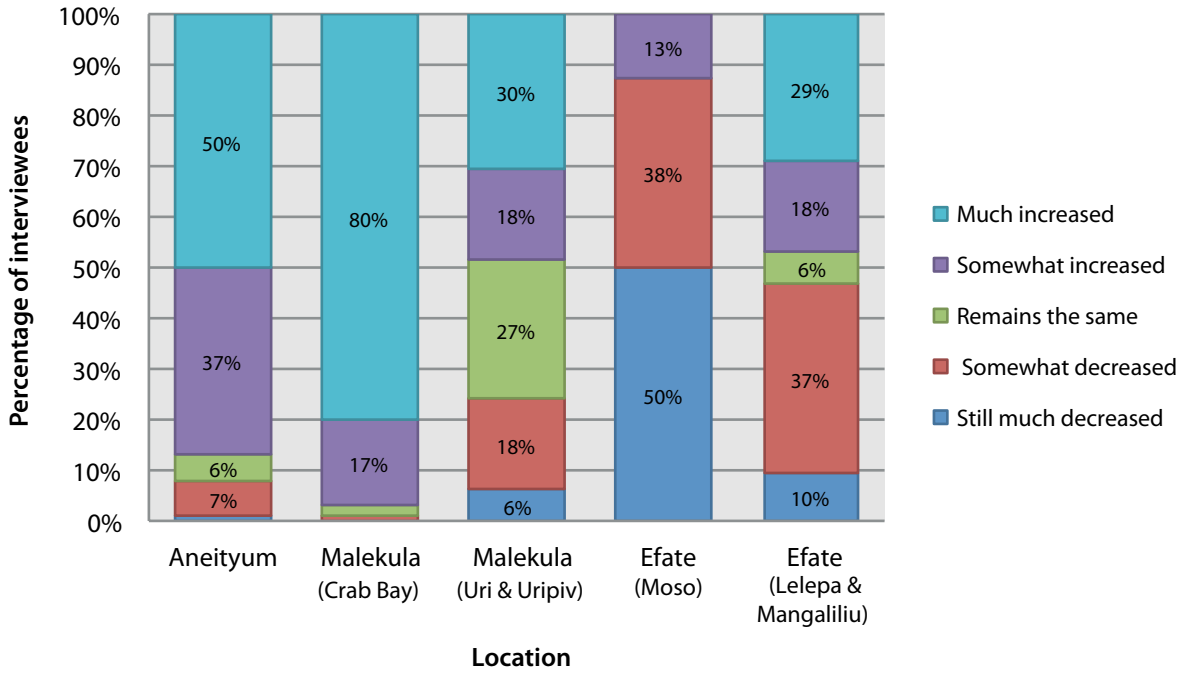

Figure 19. Recognition of resource condition by communities.

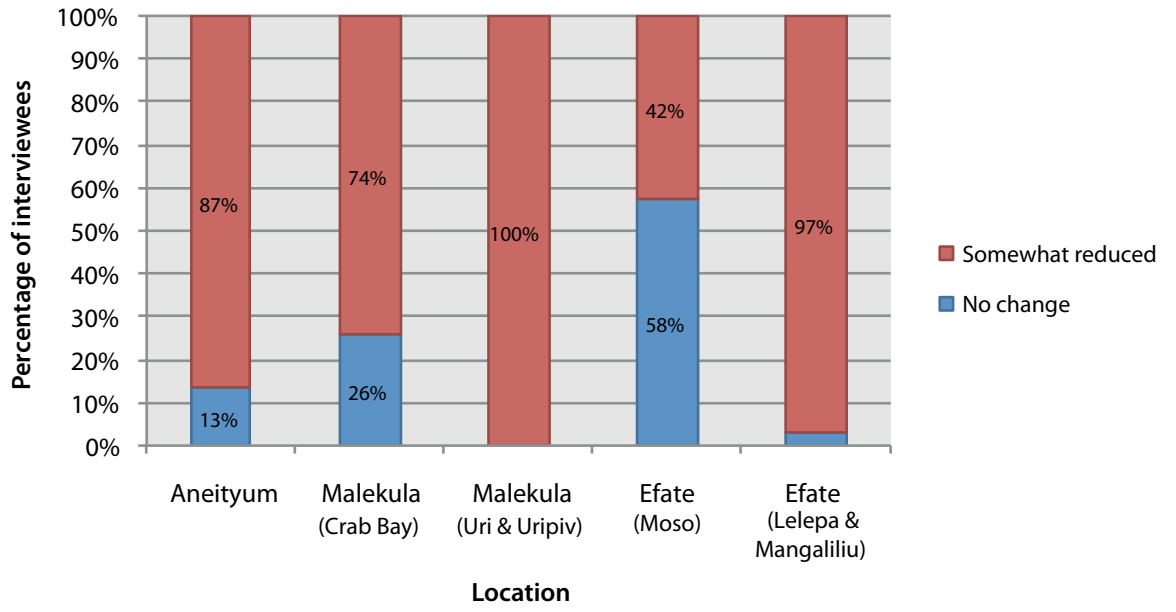

Figure 20. Change in fishing activities by communities.

9.2.3. Efate

In terms of the target communities, Mangaliliu has the most favourable market access because it takes only about 30–40 minutes to reach Port Vila. People living in Lelapa, Tassiriki and Sunae take a boat from their islands to the main island, where both public transport and a charter bus are available.

10. Analysis

Based on information derived from the questionnaire-based surveys and workshops, the project team identified challenges confronting coastal resource management at each site (i.e. Aneityum, Malekula and Efate). In this concluding section we consider approaches to tackle these challenges.

10.1. Aneityum

10.1.2. Current issues, opportunities and challenges for CBCRM

Tourist cruise ships from Australia have been visiting Aneityum for over 30 years, and this has gotten local communities to organise themselves. As a result, the average monthly income in Aneityum is the highest among all target communities. Further, coastal fisheries resources have been closely associated with the development of tourism because the communities have sought to preserve them in order to maintain tourism, their main income source.

In the early-1990s shellfish with high economic value declined as a consequence of overharvesting, and this resulted in a ban on shellfish harvesting that was enacted by the Government of Vanuatu, and the CBCRM that was initiated in the late-1990s. Together, these actions helped increase shellfish resources. In 2007, the MPA around Mystery Island was established. It has become important for tourism, and a resource management plan that included an article on the MPA has gone into effect. In general, the preservation of coastal resources inside the MPA has been successful because many community members recognise an increase of resources as being the result of the long-term implementation of CBCRM.

On the other hand, some residents are concerned about a decrease in reef fisheries resources, especially lobsters, which at present are sold only to tourists. The possibility of marketing other fisheries products has not been considered, so this exclusive reliance on lobsters to generate a cash income accelerates the decrease in stocks, which are recognised as potentially facing a collapse. At the community workshop, both community members and VFD were greatly concerned about the decline in local reef fisheries resources, which they believe is caused by people catching juvenile fish outside the MPA, an increasing demand for fish owing to population growth in the face of limited alternative sources of animal protein, a weakening of the traditional governance system, and a general lack of awareness of the issues involved.

Most community members believe that it is necessary to allow a partial opening of the MPA (see above, Fig. 13). Further, almost half of all community members think that other members lack the will to maintain the MPA in the future (see above, Fig. 12).

Possible ways to promote CBCRM

A pilot project to promote a transition from the ban on fishing to the use of resources under a sustainable resource management regime has been discussed in Aneityum. The main objective would be the reduction of fishing pressure on lobster resources through a diversification of fishing activities, and alternative means of income generation.

The MPA committee will organise farmers and fishermen under the traditional chiefs' rule. The committee aims to develop fishery production outside the reefs, which are important protein resources, and manage them sustainably in close cooperation with the fishermen's organisation. Simultaneously, the demand for reef fish must be managed in order to balance their preservation with economic activity, if sustainable coastal resource management is to be ensured.

To confront those challenges, based on the results of surveys and workshops, the project proposes to adopt a comprehensive approach to design the pilot project using five possible solutions. These are:

1. Provision of an alternative source of income linked with tourism, such as the development of new fishery products, handicrafts and other items for tourists;

2. Diversification of fishing areas and target resources, including the catching of nearshore pelagic resources;

3. Interventions on fishing activities by setting size limits for lobsters and controlling the opening of MPAs;

4. Boosting awareness on sustainable coastal resource management by involving women; and

5. Strengthening MPA committee, especially to plan resource management that would include handling demands for the increased coastal resource use, raising community awareness by organising fora (e.g. to report on resource conditions based on surveys), and supervising alternative means of making a livelihood outside the reef.

Considerations for implementing pilot projects

In designing and implementing the pilot projects, it is necessary to consider that the ratio of disputes in Aneityum is the highest among the regions surveyed, although the willingness of people to participate in community activities is also the highest. This seeming contradiction may indicate a willingness to put aside personal conflicts for the sake of the wider community interest.

From the viewpoint of social characteristics in this area, despite past success with coastal resource management, the level of understanding of coastal resource management in the community has been insufficient. Further, the level of understanding among women is lower than that of men, indicating the importance of raising awareness on coastal resource management through the participation of women. In addition, although most respondents agree with the plan, 33% hold some degree of negative opinion including "(not complete but) somewhat appropriate" and "not appropriate" (see above, Fig. 10). This should be taken into consideration when implementing the pilot projects.

10.2. Malekula

10.2.1. Current issues, opportunities and challenges for CBCRM

Inhabitants of Crab Bay harvest land crabs for sale, although their main livelihood is agriculture and they do no other kind of fishing. Management of the land crab resource has been widely acknowledged as exemplifying a successful MPA because most community members in Crab Bay recognise the increase of coastal resources (see above, Table 8). The average monthly income in Crab Bay is the second highest among the target communities, following Aneityum (see above, Table 27).

On the other hand, people in Uri and Uripiv harvest land crabs in addition to engaging in other fishing activities. The average monthly income in these villages is the lowest among the target areas, and amounts to a subsistence livelihood. With respect to resource management, respondents from Uri and Uripiv differed in their recognition of increase or decrease in the resource after implementing CBCRM. This difference could be because some villagers fish around Crab Bay, whereas others harvest resources in the Uri and Uripiv islands.

At the community workshop participants from Malekula raised a concern over poaching and ignorance of local fishing rules. The MPA committee understands the significance of enhancing their monitoring capacity, despite their MPAs being located in 16 different communities. To realise effective resource management, the MPA committee must raise funds for personnel to monitor and survey fishing activities in the Crab Bay area.

From the viewpoint of social characteristics in this area, Crab Bay people show a high level of understanding of the resource management plan, whereas those of Uri and Uripiv do not (see above, Fig. 9). In addition, most Crab Bay respondents answered that the existing resource management plan is "very appropriate" and that the entire community wants to retain it. However, the people of Uri and Uripiv responded negatively (see above, Figs. 10 and 12).

Possible ways to promote CBCRM

A pilot project will be promoted to bring together the different emphases of the individual CBCRM activities in both Uri and Uripiv, and Crab Bay. Its principal objective is the strengthening of the Resource Management Committee via enhanced financial mechanisms and management capabilities.

Because the backgrounds of Uri and Uripiv, and Crab Bay differ, the project has adopted different measures for these regions. In Uri and Uripiv, the focus is on the preservation of coastal resources, including the development of alternative livelihoods, which could help reduce fishing pressure on the reef. In contrast, in Crab Bay the focus is on enhancing the existing MPA committee's activities, especially its capacity to organise community activities. Further, in Malekula the aim is to bring these different measures together under the Amal-Crab Bay MPA Committee, to enhance the regional capacity for sustainable coastal resource management.

Based on the results of the surveys and workshops the pilot project will adopt the following comprehensive four-pronged approach.

1. Enhance inter-community cooperation to enable well-coordinated fishing and marketing to meet buyer requirements. (This will require the communities to make a financial contribution to the committee.)

2. Diversify fishing areas and target resources, including use of nearshore pelagic resources.

3. Add value to fishery products through collective efforts to promote intra- and inter-island fish marketing.

4. Strengthen the MPA committee, especially to handle finances and improve its capacity to manage and organise community activities.

Considerations for implementing pilot projects

For designing and implementing these pilot projects, the existing gaps between Crab Bay and Uri-Uripiv must be bridged in order to strengthen CBCRM in this area. In Crab Bay, a low level of willingness to

participate in community activities was identified (see above, Table 22). Motivation to contribute time and money for community activities is also low, although not many disputes occur, according to respondents. Further, since the principal livelihood activity in this region is not fisheries it could be challenging to organise additional community participatory activities for coastal resource management. Rather, it is necessary to design a pilot project focused on enhancing existing activities of the MPA committee.

On the other hand, the people of Uri and Uripiv are willing to offer their time and labour, but not financial resources, for community activities (Table 22). This reflects that the average monthly income in Uri and Uripiv was the lowest among the target communities (Table 27) and that their coastal resources are decreasing. Thus, it is essential to introduce alternative income-generating activities to Uri and Uripiv to bridge the gaps between the two areas, in conjunction with improving the condition of coastal resources by such means as raising funds from a portion of the profit gained by the alternative livelihood activities, and enhancing resource monitoring by the MPA committee.

10.3. Efate

10.3.1. Current issues, opportunities and challenges for CBCRM

Efate, where the first phase of the project was implemented, has several advantages for CBCRM, including easy access to government services and the large markets of the capital. Nevertheless, CBCRM is not fully established in Efate owing to the challenges caused by social and cultural differences among the communities in the area. At the community workshop, participants from Efate were greatly concerned by the declining trend of coastal resources, both inside and outside the reef.

Many respondents to the questionnaire-based survey in Moso acknowledged a decline in resources both within and outside the reef. In contrast, recognition of the issue by respondents in Lelepa and Mangaliliu varied, with almost half admitting a decrease. Although Lelepa, Mangaliliu and Moso use the fisheries resources of adjacent areas, their recognition of the resource condition and opinions regarding the management plan differ (see Figs. 19 and 20).

On the east side of Moso, facing the main island of Efate, where the communities are located, ignorance of the taboo area by local people is regarded as a problem. On the west side, adjacent to the open ocean and lacking community people, poaching by outsiders is identified. The respondents of Moso considered that high priority should be given to education and awareness raising for resource preservation, as the results indicate that most people in Moso do not understand the MPA resource management plan (see above, Fig. 9). (This occurred because, owing to friction among communities, Moso was excluded from the target communities selected to develop a resource management plan in the first phase of the project.)

In addition, in Lelepa and Mangaliliu, those who recognise the resource increase hope for a temporary opening of the MPA, just as in Aneityum (Fig. 21). In contrast, the people of Moso differ in their views. Further, like in Moso those who acknowledge a resource increase after implementing the resource management plan tend voluntarily to limit their own fishing activities (Fig. 22). This seems to be a positive effect. Lelepa, Mangaliliu and Moso show different tendencies regarding compliance with the resource management plan and opinions about MPAs. In this, perceptions regarding and willingness to participate in resource management are complicated.

As mentioned above, the coastal resource management plan drafted by the representatives of the four communities in the first phase of the project has not been finalised, thus implementation of the region-wide coastal resource management plan is pending. Also, a planned Fishermen's Association is yet to be established. To realise sustainable resource management in Efate, communities sharing the same resources must to work together to overcome their differences.

Possible ways to promote CBCRM

A pilot project is planned to establish activities in each community, with the objective of improving compliance with management measures through enhanced functions of management units.

As a basic first step in tackling the above-mentioned challenges it is necessary to bring people from each community together for activities. Then it could be possible to establish an inter-community-based MPA committee. Meanwhile, the project proposes to establish specific purpose groups, such as a "Shell Culture Cage Group" or "A Fish Aggregating Device (FAD) Fisher's Group", composed of members from every community involved in such activities. Through such specific purpose groups, the project intends to establish a working relationship that extends beyond the boundary of each community in Efate.

Based on the results of the surveys and workshops, the project proposes a comprehensive approach to the design of the pilot project, based on the following five solutions:

1. Provision of alternative sources of income, such as a shellfish ocean nursery, as well as a village-based fish promotion event, and souvenir production linked with tourism.

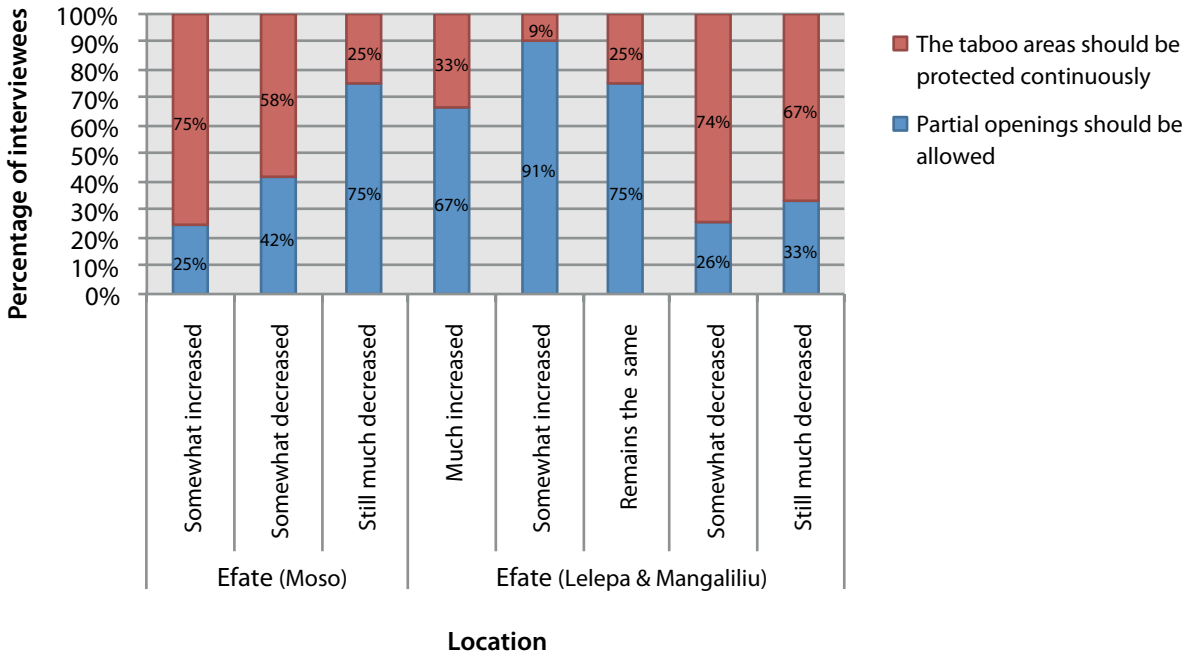

Figure 21. Relationship between the recognition of resource condition and opinion on marine protected areas, Efate.

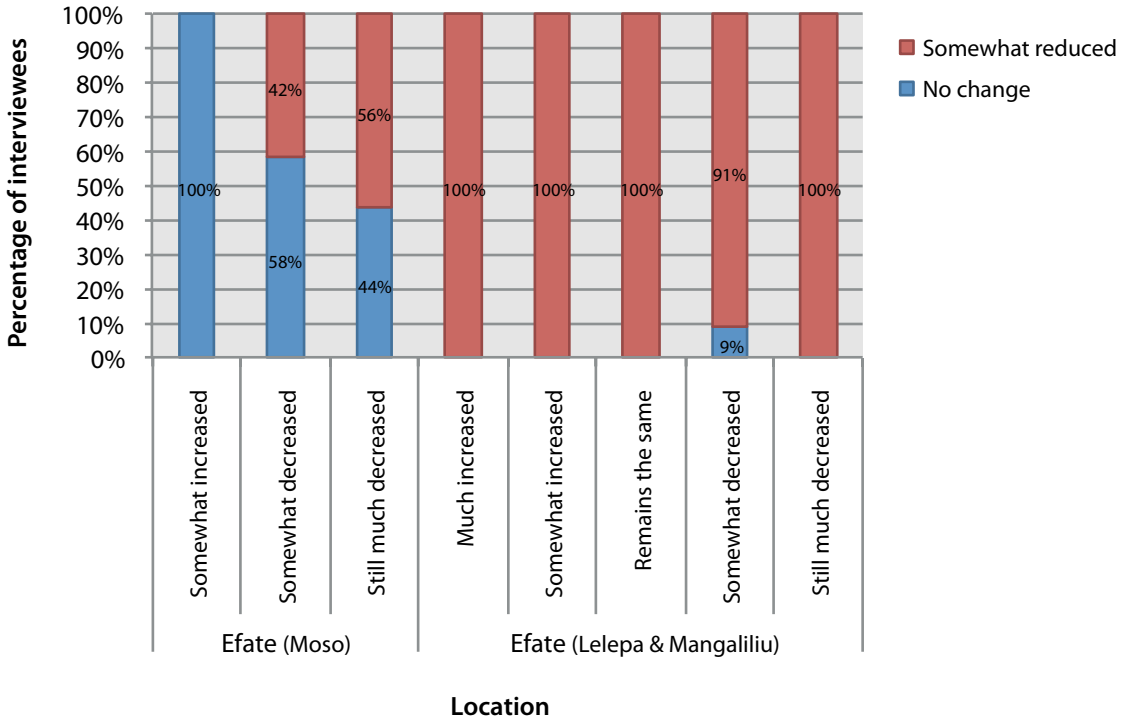

Figure 22. Relationship between the recognition of resource condition and change in fishing activities, Efate.

2. Enhancement of inter-community cooperation through the joint organisation of that fish promotion event, using community-based cooperation practices and with activity-specific working groups, including the shell culture cage group and FAD fishers' group.

3. Diversification of fishing areas and target resources, including use of nearshore pelagic resources. Offshore fishing development is difficult to realise within the project period because of limited resources and environmental considerations.

4. Interventions on fishing activities by MPAs.

5. Strengthening of the MPA committee, especially for monitoring and supervision to prevent poaching and violating the taboo areas.

Considerations for implementing pilot projects

In designing and implementing these pilot projects, it should recalled that the attempt to establish a region-wide MPA committee with all the communities in Efate in the first phase of the project seems to have failed, owing to a lack of cooperation among the communities. The experiences of the project as well as the results of the baseline survey indicate that additional challenges to bringing people together exist within the community. For example, in Lelepa and Mangaliliu the willingness to participate in community activities is very low, and respondents perceive an inequity regarding social activities. In contrast, respondents in Moso indicate the highest communal reliability. The most fundamental and appropriate approach is to strengthen the resource management capacity of each community as the first step of to ensuring future solidarity beyond existing boundaries.

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Appendix 1: Questionnaires used for the survey[10]

Sheet 1

Questionnaire for community representatives

Project for Promotion of Grace of the Seas for Coastal Village in Vanuatu Phase 2

Code Number	

1.0 Preliminary Information

1.1 Province _____

1.2 Village / Community _____

1.3 Name of Enumerator _____

1.4 Date of Interview _____

2.0 Profile of Community Leaders / Representative

2.1 Name of leader / representative: _____

2.2 Gender ☐ 1. Male ☐ 2. Female

2.3 Age: _____ years old

2.4 Ethnicity: _____

2.5 Education ☐ 1. No school attendance ☐ 2. Primary school ☐ 3. Secondary school

Attainment: ☐ 4. High school ☐ 5. Collage / University ☐ 6. Other (specify) _____

2.6 Contact Phone Number _____

3.0 Community Characteristics

3.1 How many years has this community been existence? about _____ years

3.2 How many households are in this community? about _____ households

3.3 In the last 3 years, the population of this community has

☐ 1. Increased ☐ 2. Decreased ☐ 3. Remained the same

3.4 What are the two main reasons for increasing, decreasing or no change in the population of this community?

a. _____

b. _____

3.5 What are the three main economic activities for men in the community:

a. _____

b. _____

c. _____

3.6 What are the three main economic activities for women in the community:

a. _____

b. _____

c. _____

3.7 What is the main route that inhabitants use to reach this community?

☐ 1. Land road ☐ 2. Foot path ☐ 3. Sea ☐ 4. Other (specify) _____

[10] The following appendices are in their original, raw format and have not been edited or corrected.

3.8 In the last three years, the road leading to this community has:

☐ 1. Improved ☐ 2. Worsened ☐ 3. Remained the same

3.9 The availability of housing in this community is:

☐ 1. Enough ☐ 2. Not enough

3.10 In the last three years, the quality of housing in this community has:

☐ 1. Improved ☐ 2. Worsened ☐ 3. Remained the same

3.11 What are the main two reasons that housing in this community has improved, worsened or remained the same?

a) _____

b) _____

3.12 In the last three years, the overall quality of life of the people living in this community has:
(consider job availability, safety and security, environment, housing, etc.)

☐ 1. Improved ☐ 2. Worsened ☐ 3. Remained the same

3.13 Overall, the level of living of this community may be characterized as:

☐ 1. Wealthy ☐ 2. Well-do ☐ 3. Average ☐ 4. Poor ☐ 5. Very Poor

4.0 Principal Services

4.1 Drinking Water

4.1.1 How is the water obtained?

☐ 1. River ☐ 2. Rain ☐ 3. Well ☐ 4. Other (specify) _____

4.1.2 Currently, the potable water service is:

☐ 1. Very Good ☐ 2. Good ☐ 3. Average ☐ 4. Poor ☐ 5. Very Poor

4.1.3 What are the two main problems with the portable water service?

a) _____

b) _____

4.2 Communication Service

4.2.1 Can the people use cellular phones in this community?

☐ 1. Yes ☐ 2. No

4.2.2 What percentage of household do you think have cellular phones in this community?

☐ 1. Majority of households (more than 80%) ☐ 2. At least 50% of households

☐ 3. Less than 50% of households

4.3 Sewage

4.3.1 Do the roads of this community have sufficient sewers and drains to handle excess water and prevent flooding, when it rains?

☐ 1. Yes ☐ 2. No

4.3.2 What other sewage and waste water systems are used in this community?

☐ 1. Traditional toilet ☐ 2. Water-flush toilet ☐ 3. River / Sea

☐ 4. Other (specify) _____

4.4 Garbage Disposal

4.4.1 What is the main solid waste disposal method?

☐ 1. Burn it ☐ 2. Throw on disposal lots ☐ 3. Throw into river / sea ☐ 4. Bury it

☐ 5. Other (specify) _____

4.5 Transport

4.5.1 Public transport (bus, boat, etc.) is available:

☐ 1. Every day ☐ 2. 4 - 6 days per week ☐ 3. 1 - 3 days per week ☐ 4. None

4.5.2 What other types of transport do people in this community use to go to neighbouring communities?

☐ 1. Walking ☐ 2. Bicycle ☐ 3. Horse ☐ 4. Canoe ☐ 5. Car / Pickup

4.6 Recreation

4.6.1 Does this community have sport fields or recreational areas?

☐ 1. Yes ☐ 2. No

4.6.2 In the three years, the condition of the sport fields and recreational areas has:

☐ 1. Improved ☐ 2. Worsened ☐ 3. Remained the same

4.7 What are important needs for this community? Specify most important needs for public service.

Priority No.1 _____

Priority No.2 _____

Priority No.3 _____

5.0 Social Condition and Services

5.1 Labour migration

5.1.1 Are there members of this community who go to other places to work during certain period of the year?

☐ 1. Yes ☐ 2. No

5.1.2 Where do they go to work primarily?

☐ 1. To a city in the island ☐ 4. To a rural area in the island

☐ 2. To a city in another island ☐ 5. To a rural area in another island

☐a rural area in another islandnd ☐ 6. To rural areas in another country

5.2 Education

Primary School

5.2.1 Does this community have a public primary school?

☐ 1. Yes ☐ 2. No

5.2.2 Is the number of teachers in the primary school sufficient for the number of students?

☐ 1. Yes ☐ 2. No

5.2.3 The physical condition of the primary school is:

☐ 1. Very Good ☐ 2. Good ☐ 3. Average ☐ 4. Poor ☐ 5. Very Poor

If not so good, specify what is in poor condition (roof, wall, furniture, etc.)

_____

Secondary School

5.2.4 Does this community have a public secondary school?

☐ 1. Yes ☐ 2. No

5.2.5 Is the number of teachers in the secondary schools sufficient for the number of students?

☐ 1. Yes ☐ 2. No

5.2.6 The physical condition of the secondary school is:

☐ 1. Very Good ☐ 2. Good ☐ 3. Average ☐ 4. Poor ☐ 5. Very Poor

If not so good, specify what is in poor condition (roof, wall, furniture, etc.)

_____

5.3 Health

5.3.1 What are the two principal health problems affecting *children* in the community

a) _____

b) _____

5.3.2 What are the two principal health problems affecting *adult men* in the community

a) _____

b) _____

5.3.3 What are the two principal health problems affecting *adult women* in the community

a) _____

b) _____

5.3.4 Does this community have a health clinic or post?

☐ 1. Yes ☐ 2. No

5.3.5 Does the health clinic or post regularly have sufficient:

a. Medicine	☐ 1. Sufficient	☐ 2. Insufficient	☐ 3. None
b. Equipment	☐ 1. Sufficient	☐ 2. Insufficient	☐ 3. None
c. Patient beds	☐ 1. Sufficient	☐ 2. Insufficient	☐ 3. None
d. Physicians	☐ 1. Sufficient	☐ 2. Insufficient	☐ 3. None
e. Nurses	☐ 1. Sufficient	☐ 2. Insufficient	☐ 3. None

6.0 Agriculture, Livestock or Fisheries

6.1 What are the three principal products of agriculture, livestock or fisheries in this community?

Agriculture	*Livestock*	*Fisheries*
a1. _____	l1. _____	f1. _____
a2. _____	l2. _____	f2. _____
a3. _____	l3. _____	f3. _____

6.2 Where do the people of this community generally sell their products?

Agriculture	*Livestock*	*Fisheries*
☐ 1. Community market	☐ 1. Community market	☐ 1. Community market
☐ 2. Market in neighbouring areas	☐ 2. Market in neighbouring areas	☐ 2. Market in neighbouring areas
☐ 3. Middlemen	☐ 3. Middlemen	☐ 3. Middlemen
☐ 4. Local stores / shops	☐ 4. Local stores / shops	☐ 4. Local stores / shops
☐ 5. Only household consumption	☐ 5. Only household consumption	☐ 5. Only household consumption
☐ 6. Other _____	☐ 6. Other _____	☐ 6. Other _____

6.3 What are the two most important problems facing this community for getting their products to markets and earning?

a) _____

b) _____

6.4 Does this community have any type of agriculture, livestock and fisheries organization such as a cooperative or association?

Agriculture	*Livestock*	*Fisheries*
☐ 1. Yes ☐ 2. No	☐ 1. Yes ☐ 2. No	☐ 1. Yes ☐ 2. No

6.5 Dose this community have any institution or person (either in this community or nearby) that provides credit or loans to agriculture, livestock fisheries producers?

☐ 1. Yes ☐ 2. No

What kind of institution or persons that provides credit or loans?

☐ 1. Commercial bank ☐ 2. Government office ☐ 3. NGO ☐ 4. Community group

☐ 5. Church ☐ 6. Middlemen ☐ 7. Other (specify) _____

6.6 In the last three years, the yields or catch of the products in this community have:

Agriculture	*Livestock*	*Fisheries*
☐ 1. Increased	☐ 1. Increased	☐ 1. Increased
☐ 2. Decreased	☐ 2. Decreased	☐ 2. Decreased
☐ 3. Remained the same	☐ 3. Remained the same	☐ 3. Remained the same

6.7 In the last three years, the sale of the products (no matter within/outside this community) have:

Agriculture	*Livestock*	*Fisheries*
☐ 1. Increased	☐ 1. Increased	☐ 1. Increased
☐ 2. Decreased	☐ 2. Decreased	☐ 2. Decreased
☐ 3. Remained the same	☐ 3. Remained the same	☐ 3. Remained the same

7.0 Community Support

7.1 Which of the following organizations exist in this community?

☐ 1. Community development committee ☐ 6. Women's group

☐ 2. Cooperative (fisheries, agriculture, etc.) ☐ 7. Sport group

☐ 3. Parent-teacher association ☐ 8. Cultural group

☐ 4. Health committee ☐ 9. Other (specify) _____

☐ 5. Youth group

7.2 Which persons or organizations help or support these community-based organizations?

☐ 1. Local government ☐ 6. NGO

☐ 2. National government ☐ 7. Business group

☐ 3. Politician ☐ 8. Prosperous citizen

☐ 4. Religious organizations ☐ 9. The community as a whole

☐ 5. School / Teachers ☐ 10. Other (specify) _____

7.3 Which building do people in this community regularly use for meeting and gathering?

- ☐ 1. Community center
- ☐ 2. Home of community chief
- ☐ 3. Home of other local leaders
- ☐ 4. Church or religious building
- ☐ 5. Health center
- ☐ 6. Government office
- ☐ 7. Business / Commercial building
- ☐ 8. Other (specify) _____

7.4 Which members of the community participate most in solving the issues facing the community?

By gender

- ☐ 1. Men
- ☐ 2. Women
- ☐ 3. Men and women equally
- ☐ 4. Neither participate

By age

- ☐ 1. Youth
- ☐ 2. Adults
- ☐ 3. Older persons
- ☐ 4. Youth, adults and elders equally
- ☐ 5. None participate

8.0 Collective Action Solidarity

8.1 People from the same village / neighbourhood often get together to address a particular issues that face the community, fix a problem, improve the quality of life, or something similar.

Which of the following issues has this village / neighborhood tried to address in the last three years?

- ☐ 1. Education
- ☐ 2. Health
- ☐ 3. Public services
- ☐ 4. Road and transportt
- ☐ 5. Market
- ☐ 6. Credit
- ☐ 7. Recreational and cultural resources
- ☐ 8. Security
- ☐ 9. Child Care
- ☐ 10. Technical services of agriculture / livestock / fisheries
- ☐ 11. Natural resource protection
- ☐ 12. Other (specify) _____

9.0 List of Community Institutions

9.1 What are the groups, organizations, or associations that function in this community?

*Have the group list all the organizations, formal and informal, that exist in the community.

*Make sure all different types of organizations are included (agriculture, fisheries, credit, religious, recreational, health, education, etc.) and that the list is as complete as possible.

*Have the group go through the list and identify which institutions are most important in meeting community needs.

Name	No. of members	Main activities	Norm	Frequency of meeting	Level of participation
			1: In verbal 2: In written 3: None	Time per week/ month/year	1: More active 2: Same 3: Less active

*Norm: It is not necessary to describe contents, but please specify whether the norm is in verbal or in written.

*Frequency of meetings: In case of having regular meeting, how many times per week / month / year?
In case of irregular meeting, how many times did they have one in last year?

*Level of participation: Is the current level of participation More Active / Same / Less Active, compared with the past?

9.2 Which groups play the most active role in helping improve the well-being of community members?

_____

9.3 How did these community groups or organizations get started (government initiative, through government donation, NGO donations, grassroots initiative, etc.)?

_____

_____

10.0 Trust and Cooperation in the Community

10.1 Do people in this community generally trust one another in matters of lending and borrowing?

☐ 1. Yes ☐ 2. No

10.2 In the last three years, has the level of trust in this community improved, worsened, or stayed the same?

☐ 1. Improved ☐ 2. Worsened ☐ 3. Stayed the same

10.3 Do you agree or disagree with the following statement?

People here look out mainly for the welfare of their own families and they are not much concerned with community welfare.

☐ 1. Strongly agree ☐ 2. Agree ☐ 3. Disagree ☐ 4. Strongly disagree

Sheet 2

Questionnaire for household representatives

Project for Promotion of Grace of the Seas for Coastal Village in Vanuatu Phase 2

Code Number	

1.0 Preliminary Information

1.1 Province _____

1.2 Village / Community _____

1.3 Name of Enumerator _____

1.4 Date of Interview _____

2.0 Profile of Household Representative

2.1 Name of representative: _____

2.2 Sex : ☐ 1. Men ☐ 2. Women

2.3 Age : _____ years old

2.4 Ethnicity : _____

2.5 Education attainment : ☐ 1. No school attendance ☐ 2. Primary school ☐ 3. Secondary school ☐ 4. High school ☐ 5. Collage / University ☐ 6. Other _____

2.6 Contact Phone Number _____

3.0 Household Structure and Economy

3.1 Structure of household

Sex (M or F)	Age	Occupation	Education Level	Where does he (she) live?	How long have you lived here? (years)

3.2 Household economy - What are the three main economic activities in your family?

	Economic activity	Main activities / products
No.1		
No.2		
No.3		

*Economic activity: Please select from the following items.

1. Agriculture; 2. Fisheries; 3. Livestock; 4. Forestry; 5. Tourism; 6. Office work

In case of others, please specify it.

3.2.1 What is the average income of your family?

Average income of the household: _____ vatu / month

by income source

1. Agriculture _____ vatu / month
2. Fisheries _____ vatu / month
3. Livestock _____ vatu / month
4. Tourism _____ vatu / month
5. Remittance _____ vatu / month
6. Other _____ _____ vatu / month

3.2.2 What is the average living cost of your family?

Average living cost of the household: _____ vatu / month

By cost items

1. Food _____ vatu / month
2. Education _____ vatu / month
3. Electricity / Fuel _____ vatu / month
4. Phone _____ vatu / month
5. Transport _____ vatu / month
6. Medical / Health _____ vatu / month
7. Other _____ _____ vatu / month

4.0 Fishing Activities

4.1 What is the average amount of fish catch?

_____ kg / day

4.2 How many days does your family go to fishing per week?

☐ Everyday ☐ 5 - 6 days per week ☐ 3 - 4 days per week ☐ 1 - 2 days per week

4.3 Do you have boat or canoe for fishing activity?

☐ 1. Yes ☐ 2. No

If yes, what type of boat or canoe do you have?

☐ 1. Wooden canoe without sail ☐ 2. Wooden canoe with sail ☐ 3. Aluminum boat

☐ 4. Plastic (FRP) boat ☐ 5. Other (specify) _____

4.4 Do you have own outboard engine?

☐ 1. Yes ☐ 2. No

If yes, what type of outboard engine does you have?

☐ 1. Two stroke engine ☐ 2. Four stroke engine

Horse power (HP): _____

4.5 What type of fishing gears do you use?

☐ 1. Handline ☐ 2. Spear gun ☐ 3. Gill net ☐ 4. Cast net

☐ 5. Fish trap ☐ 6. Other (specify) _____

4.6 Where are the main fishing ground?

☐ 1. Reef in front of the community ☐ 2. Coastal areas (within 3 miles)

☐ 3. Offshore areas (beyond 3 miles) ☐ 4. Other (specify) _____

5.0 Consumption

5.1 During an average / normal week, on how many days do you prepare fish and other seafood for your family?

	7 days	5 - 6 days	3 - 4 days	1 - 2 days	None
a. Fresh fish	☐	☐	☐	☐	☐
b. Other seafood	☐	☐	☐	☐	☐

5.2 Where do you normally get your fish and seafood from?

a. Fish

☐ 1. Caught by myself / member of this family

☐ 2. Get it from somebody in the family / community (no money paid)

☐ 3. Buy it at _____ (specify)

Which is the most important source?

☐ 1. Caught ☐ 2. Given ☐ 3. Bought

b. Shellfish / Sea cucumber

☐ 1. Caught by myself / member of this family

☐ 2. Get it from somebody in the family / community (no money paid)

☐ 3. Buy it at _____ (specify)

Which is the most important source?

☐ 1. Caught ☐ 2. Given ☐ 3. Bought

6.0 Structural Social Capital

6.1 Organizational Density and Characteristics

What community groups, organizations or associations do your family members belong to?

Do you consider yourself / your family member to be active in the groups?

Are you / your family member a leader in the group?

Which of these groups is the most important to your household?

Name of organization	Who belongs?	Degree of participation	Importance
	1:Household Head, 2:Wife, 3.Child, 4:Elder, 5:Other	1:Leader, 2:Very Active, 3:Somewhat active, 4:Not Active	1: No.1, 2: No.2 3: No.3

6.2 Network and Mutual Support Organization

If the primary school of this community went without a teacher for a long time (say six months or more), which people in this community do you think would get together to take some action about it?

☐ 1. No one in the village / neighborhood would get together.

☐ 2. Local government

☐ 3. Village / neighbourhood association ☐ 5. The entire village / neighbourhood

☐ 4. Parents of school children ☐ 6. Other (specify)_____

6.3 Exclusion

6.3.1 Differences often exist between people living in the same community.

To what extent do differences such as the following tend to divide people in this community?

	1. Not at all	2. Somewhat	3. Very much
a. Differences in education	☐	☐	☐
b. Differences in wealth / material possessions	☐	☐	☐
c. Differences in land holdings	☐	☐	☐
d. Differences in social status	☐	☐	☐
e. Differences between men and women	☐	☐	☐
f. Differences between younger and old generation	☐	☐	☐
g. Differences between long-time inhabitants and new settlers	☐	☐	☐
h. Differences in political party affiliations	☐	☐	☐
i. Differences in religious beliefs	☐	☐	☐
j. Other differences (specify)_____	☐	☐	☐

6.3.2 Do these differences cause problems in this community?

☐ 1. Yes ☐ 2. No

If yes, what are they?

_____

_____

6.3.3 How are these problems usually handled?

☐ 1. People work it out between themselves ☐ 5. Religious leaders mediate

☐ 2. Family / household members intervene ☐ 6. Judicial leader mediate

☐ 3. Neighbours intervene ☐ 7. Other (specify)_____

☐ 4. Community leader mediate

6.4 Previous Collective Action

6.4.1 In the past year, how often have members of this community got together, and jointly petitioned government officials or political leaders with community development as their goal?

☐ 1. Never ☐ 2. Once ☐ 3. A couple of times ☐ 4. Frequently

6.4.2 Were any of these actions successful?

☐ 1. Yes, all were successful

☐ 2. Some were successful and others not

☐ 3. No, none were successful

6.4.3 How often in the past years have you joined together with others in this community to address a common issue?

☐ 1. Never ☐ 2. Once ☐ 3. A couple of times ☐ 4. Frequently

6.4.4 If some decision related to a development project needed to be made in this community, do you think the entire community would be called upon to decide, or would community leaders make the decision?

☐ 1. The community leader would decide

☐ 2. The whole community would be called

6.4.5 How would you rate the spirit of participation in this community?

☐ 1. Very low ☐ 2. Low ☐ 3. Average ☐ 4. High ☐ 5. Very high

7.0 Cognitive Social Capital

7.1 Solidarity

7.1.1 Suppose your neighbor suffered an economic loss, for example crop failure. In that situation, who would assist him / her financially?

☐ 1. No one would help
☐ 2. Family
☐ 3. Neighbours
☐ 4. Friend
☐ 5. Religious leaders / groups
☐ 6. Community leader
☐ 7. Business leader
☐ 8. Patron / employer
☐ 9. Political leader
☐ 10. Mutual support group to which he/she belongs
☐ 11. Assistance organization to which he/she does not belong
☐ 12. Other (specify) _____

7.2 Trust and Cooperation

7.2.1 Do you think that in this community the people generally trust one another in matter of lending and borrowing?

☐ 1. Yes, do trust ☐ 2. No, do not trust

7.2.2 Do you think that the last few years this level of trust has got better, got worse, or stayed about the same?

☐ 1. Better ☐ 2. The same ☐ 3. Worse

7.2.3 Do you agree or disagree that the people here look out mainly for the welfare of their own families, and they are not much concerned with this community welfare?

☐ 1. Strongly agree ☐ 2. Agree ☐ 3. Disagree ☐ 4. Strongly disagree

7.2.4 If a community project does not directly benefit your neighbour, but has benefits for others in this community, then do you think your neighbour would contribute *time* for this project?

☐ 1. Yes, will contribute time ☐ 2. No, will not contribute time

7.2.5 If a community project does not directly benefit your neighbour, but has benefits for others in this community, then do you think your neighbour would contribute *money* for this project?

☐ 1. Yes, will contribute money ☐ 2. No, will not contribute money

7.2.6 Please say whether in general you agree or disagree with the following statements:

a. Most people in this community are basically honest and can be trusted.

☐ 1. Strongly agree ☐ 2. Agree ☐ 3. Disagree ☐ 4. Strongly disagree

b. People are always interested only in their own welfare.

☐ 1. Strongly agree ☐ 2. Agree ☐ 3. Disagree ☐ 4. Strongly disagree

c. If I have a problem, there is always someone to help me.

☐ 1. Strongly agree ☐ 2. Agree ☐ 3. Disagree ☐ 4. Strongly disagree

d. Most people in this community are willing to help if you need it.

☐ 1. Strongly agree ☐ 2. Agree ☐ 3. Disagree ☐ 4. Strongly disagree

e. If you lose a pig or a goat, someone in this community would help look for it or would return it to you.

☐ 1. Strongly agree ☐ 2. Agree ☐ 3. Disagree ☐ 4. Strongly disagree

Sheet 3

Questionnaire on coastal resource management

Project for Promotion of Grace of the Seas for Coastal Village in Vanuatu Phase 2

Code Number	

1.0 Preliminary Information

1.1 Province _____

1.2 Village / Community _____

1.3 Name of Enumerator _____

1.4 Date of Interview _____

2.0 Profile of Interviewee (if you have answered Sheet 1 or 2, please write only your name)

2.1 Name of interviewee: _____

2.2 Sex : ☐ 1. Male ☐ 2. Female

2.3 Age : _____ years

2.4 Ethnicity : _____

2.5 Education Attainment : ☐ 1. No school attendance ☐ 2. Primary schooll ☐ 3. Secondary school ☐ 4. High school ☐ 5. College / University ☐ 6. Other _____

2.6 Contact Phone Number _____

3.0 Consciousness of Coastal Resource Management

3.1 Do you think that the coastal resources (reef fish, shellfish, sea cucumber, etc.) of this community have increased or decreased or stayed the same because of the coastal resource management plan?

- ☐ 1. Much increased
- ☐ 2. Somewhat increased
- ☐ 3. Stayed the same
- ☐ 4. Somewhat decreased
- ☐ 5. Still much decreased

3.2 Do you understand the contents of the coastal resource management plan?

- ☐ 1. Completely understand
- ☐ 2. Somewhat understand
- ☐ 3. A little understand
- ☐ 4. Not understand at all

3.3 Do you think the content of coastal resource management plan is appropriate for this community?

- ☐ 1. Very appropriate
- ☐ 2. Somewhat appropriate
- ☐ 3. A little appropriate
- ☐ 4. Not appropriate

3.4 Last year, how many times did you or your family participate in coastal resource management activities, such as a meeting, beach cleaning, reef checking, etc.?

- ☐ 1. More than five times
- ☐ 2. Three - four times
- ☐ 3. Once or twice
- ☐ 4. None

3.5 Do you think that the this community wants to keep / respect the coastal resource management plan?

- ☐ 1. The whole community keep it
- ☐ 2. The majority of the community keep it.
- ☐ 3. About a half of community keep it.
- ☐ 4. The majority of community does not keep it.
- ☐ 5. The whole community does not keep it at all.

3.6 After the coastal resource management plan was introduced, have you changed your fishing and collecting activities at t sea?

- ☐ 1. I avoid catching small size fish
- ☐ 2. I avoid catching certain kinds of fish, shellfish, sea cucumber, etc.
- ☐ 3. I reduce the fishing time at sea.
- ☐ 4. I reduce the amount of fish catch
- ☐ 5. Nothing changed
- ☐ 6. Other (specify) _____

3.7 Do you want to maintain the coastal resource management plan for this community?

- ☐ 1. The taboo areas should be protected continuously.
- ☐ 2. The taboo areas should be opened at a certain period.
- ☐ 3. A part of the taboo areas should be opened.
- ☐ 4. Some marine products should be allowed to be caught in the taboo areas.
- ☐ 5. I don't need the taboo area.

Fish calendar: Aneityum

Date: 24th of May 2012

Fish Name	Fishing Season (Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec)	Fishing Method	Catch Amount	Size Per Head	Average Price (vatu)	Operation days/week	Remarks
Lobster		day: scare with octopus night: Diving with light	5 lobsters/fish /week		small: 25 AUD large: 60 AUD	2-3 days/week	new moon hatching, normally less than 5 m water depth
Poulet (white, silver, gold, and red)	peak, with weal current (Apr–Aug)	Handline. Red: 200-300m others: 100-150m	20-30 fishes (1-3 kg/fish)		300/kg	3-4 days/week	Bait: Octopus, crab, helmet crab, sardine, mangroo, small tuna, skipjack
Snapper	peak, with weak current (Apr–Aug)	Handline 80-100m	20-30 fishes (1-3 kg/fish)		300/kg	3-4 days/week	
Brim	peak, with weak current (Apr–Aug)	Handline 80-100m	20-30 fishes (1-3 kg/fish)		300/kg	3-4 days/week	
Tuna	peak (Jul–Aug)	Trawling with artificial bait, such as octopus, squid etc		5kg / fish		everyday in peak time	feeding on flying fish and small squid
Wahoo	peak (Jul–Aug)		6 fishes	15-20kg / fish			
Dogtooth tuna	peak (Jul–Aug)			15-20 kg / fish			
Skipjack	peak (Jul–Aug)			2-3 kg / fish			
Marin	peak (Jul–Aug)						
Grouper (Los)		Handline, 80-100m					
Octopus	low tide (May–Jul)	by hand, stick with wire, very shallow and no diving necessary	2-3 octpus		for bait or self consumption		low tide better
Trochus		Collection without diving			Normally for self consumption, not for sales. 300/kg of troca shell		some part is taboo
Green snail							tabbo
Clam shell							die when too many
Big eye (shellfish)							
Mullet		Cast net, gill net					
Mangroo		Cast net, gill net	100-200 fish		100/fish	almost every day	
Sardine		Cast net, gill net					not all part of island
Blue fish (Parrotfish)		spear gun		5kg	300/kg (mainly for self consumption)		

Peak fishing season Fishing season

Fish calendar: Malekula

Date: 14th of June 2012

Fish Name	Fishing Season (Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec)	Fishing Method	Catch Amount	Size Per Head	Average Price (vatu)	Operation days/week	Remarks
Yellowfin tuna		Trolling			300/kg in market	5days/week in season	
Skipjack		Trolling	40-80fishes, 10-20kg	3-5pcs/kg	300/kg in market	5days/week in season	
Karong trevally		Trolling		3kg/pc	300/kg in market		
Poulet		Handline		5-8kg/pc	400/kg in market	8days/month (every 4days around New & Full moon)	Sardine being good bait
Snapper		Handline			400/kg in market		
Grouper		Handline	10kg	2-3kg	300/fish		
Pico (Raffit fish)		Gillnet & line fishing			280/kg	3–4 days/week	Helmet crab being used as bait for line fishing. New moon bring big catch
Red Mouth		Gillnet & line fishing			280/kg		
Big bel		Diving with spear			280/kg		
Blue fish (parrot fish)		Diving with spear			280/kg		
Napoleon (big parrot)		Diving with spear			280/kg		
Mustash fish		Diving with spear			280/kg		
Mangroo		Gillnet (canoe w 2-4 fishers)	300-500pcs/day		30vatu/fish	3-5days/week	mesh size: 2.5-3 fingers, nylon mono
Mullet		Gillnet	8-10kg/day		300/kg		
Sardin		Castnet and Gillnet					
Red crab		Collection by hand		2kg/12pcs (getting smaller)	250/12pcs	Only once/week (every Tuesday) for crab/fish in the area owned by the plantation	
White crab		Collection by hand					
Mud crab		Collection by hand		2kg/crab	600/kg in market		
Octopus	dry season	Diving with spear					bait for handline

Peak fishing season Fishing season

Fish calendar: Sunae, Efate

Date: 29th of May 2012

Fish Name	Fishing Season												Fishing Method	Catch Amount	Size Per Head	Average Price (vatu)	Operation days/week	Remarks
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
Mullet													Gill net (sein net)	20-30pcs ~ 100pcs		400/2fishes (Port Vila market)	3-4days/week	Full moon & new moon tine is better, Nornally daytime operation
Mangroo													Gill net (sein net)			400/3-4fishes		
Sardine													Gill net & cast net			400/20fishes		
Mustash fish													Gill net (night time), Diving with spear gun (young fishers)	2-5 lobsters		400/fish		
Red mao													Gill net (night time), Diving with spear gun (young fishers)	10kg	2-3kg	400/fish		
Caron													Gill net (night time), Diving with spear gun (young fishers)			400/fish		
Poulet													Handline			800-1,000/kg (restaurants)		
Snapper													Handline			800-1,000/kg (restaurants)		
Marlin													Trolling					
Tuna													Trolling					
Skipjack													Trolling					
Lobster													Night diving with light	1-5pcs/day		800/kg		
Octopus													Diving with spear			800-1,000/fish		
Cuttlefish (squid)													Diving with spear					

Peak fishing season Fishing season

Fish calendar: Tassikiri, Efate

Date: 29th of May 2012

Fish Name	Fishing Season (Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec)	Fishing Method	Catch Amount	Size Per Head	Average Price (vatu)	Operation days/week	Remarks
Blue fish (Parrot fish)		Diving with spear gun	20-30kg	1-2kg, 3-4kg	400/kg	2hrs/day, 4days/week	no use of boat
Garo (Snapper)		Diving with spear gun					
Red mao (Grouper)		Diving with spear gun					
Poulet (red, silver, golden & white)		Handline	10kg	2-3kg	800/kg	3-4 days/week	Number of crew: 4 fishers/ OBE boat, 1 fisher/canoe
Brim (Blue & white)		Handline		5kg/fish	1,000/kg (blue), 400/kg (white)		
Tuna	peak	Trolling with artificial bait, such as octopus, squid etc		10kg/fish	less than 400/kg		
Dogtooth tuna	peak			20kg/fish			
Skipjack	peak			2kg/fish			
Cuttlefish (squid)		Spear gun			3,000/pc (3kg/pc)		
Octopus		Spear gun			1,000/pc (big)		
Mangroo		Gill net			400/kg		inside of bay
Sardine		Cast net					inside of bay
Mullet		Gill net					inside of bay

Peak fishing season Fishing season

Fish calendar: Lelepa, Efate

Date: 7th of June 2012

Fish Name	Fishing Season (Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec)	Fishing Method	Catch Amount	Size Per Head	Average price (vatu)	Operation days/week	Remarks
Poulet (red, silver, white, yellow, brown & black)	Apr–Jun: peak; Jan–Mar, Jul–Dec: season; Jul: winter	Handline with wooden reel		1-2kg, 3-5kg	1,000/kg for 3-5kg/pc, 700/kg for 1-2kg/pc	3days/week	5,000 vatu for wooden reel materials skipjack & bonito are best bait
Yellowfin tuna	Jan–Jun, Oct–Dec: season	Trolling			450/kg (200/kg for local)		
Skipjack	Jan–Jun, Oct–Dec: season	Trolling			300/kg		
Wahoo	Jan–Jun, Oct–Dec: season	Trolling					
Dolphinfish	Jan–Jun, Oct–Dec: season	Trolling					
Bonito	Jan–Jun, Oct–Dec: season	Trolling					
Sardine	May–Jun, Oct–Dec: season; Jul–Sep: peak	Gillnet and cast net			600/kg		
Squid	Jan–Dec: season	Diving w. spear gun					
Mangroo	Jan–Dec: season	Gillnet			450/bag		
Blue fish	Jan–Dec: season	Diving w. spear gun					Young tough fishers for diving
Parrot fish	Jan–Dec: season	Diving w. spear gun					

Peak fishing season Fishing season

Fish calendar: Mangaliliu, Efate

Date: 29th of May 2012

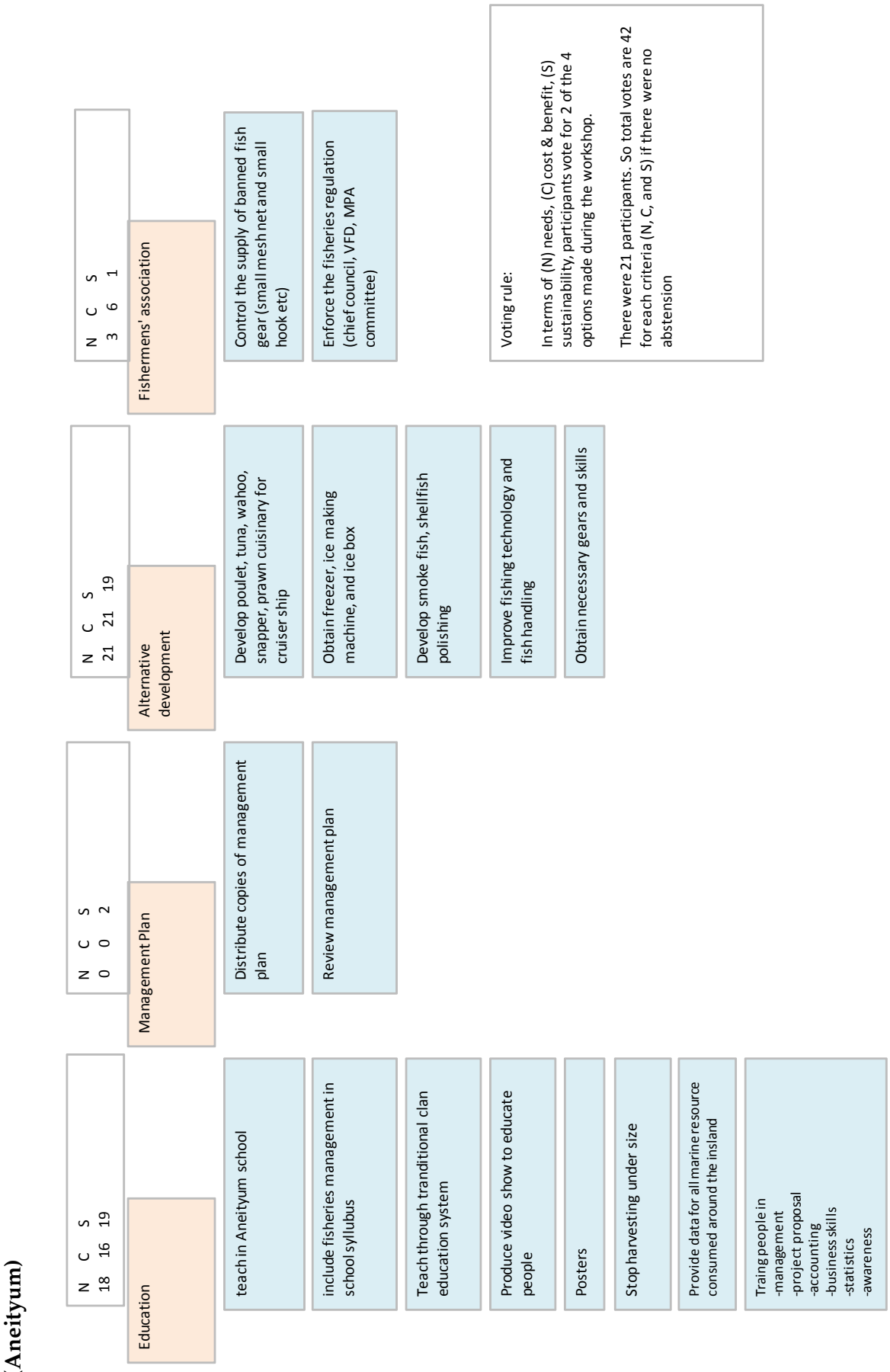
Fish Name	Fishing Season (Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec)	Fishing Method	Catch Amount	Size Per Head	Average Price (vatu)	Operation days/week	Remarks
Blue fish (Parrotfish)		Diving with spear gun	10-20kg	1-2kg, 3-4kg	450/kg	half day, 4days/week	Main customer is Bon Marche super market. For fish new moon is good time for night diving
Red mao (Snapper)		Diving with spear gun					
Caron, Rainbow		Diving with spear gun					
Lobster	closed	Night diving with light	2-5 lobsters		1,000/kg		
Poulet (red, silver, golden & white)		Handline	10kg	2-3kg	800/kg		5 OBE boats and 1canoe operating
Tuna		Trolling with artificial bait, such as octopus, tube etc			600/kg in Bon Marche		
Skipjack					500-700/fish		
Wahoo							
Dogtooth tuna							Share within community
Cuttlefish (squid)		Spear gun			2,000/pc		
Octopus		Spear gun			350/kg		
Mangroo		Gill net	200-300pcs/day		100/3fishes		

Peak fishing season Fishing season

Appendix 3: Agriculture calendar

Site	Island	Main product		Season												Average Price (Vatu)	Remarks
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Analcauhat	Aneityum	Water Taro	Preparation														First harvest is November–December, second harvest is July–December
			Harvest														
		Taro	Preparation														
			Harvest														
		Manioc	Preparation														
			Harvest														
		Kumala (Sweet Potato)	Preparation														
			Harvest														
Malekula	Uripiv	Taro	Preparation														
			Harvest														
		Banana	Preparation														
			Harvest														
		Manioc	Preparation														
			Harvest														
	Crab Bay	Taro	Preparation													400~500vatu/bag	50kg bag
			Harvest														
		Banana	Preparation													400~500vatu/bunch	
			Harvest														
		Manioc	Preparation														
			Harvest														
		Maize	Preparation													200vatu/bundle	5 maize/bundle
			Harvest														
Mangaliliu	Efate	Taro	Preparation														
			Harvest														
		Manioc	Preparation														
			Harvest														

Appendix 4: Objective analysis



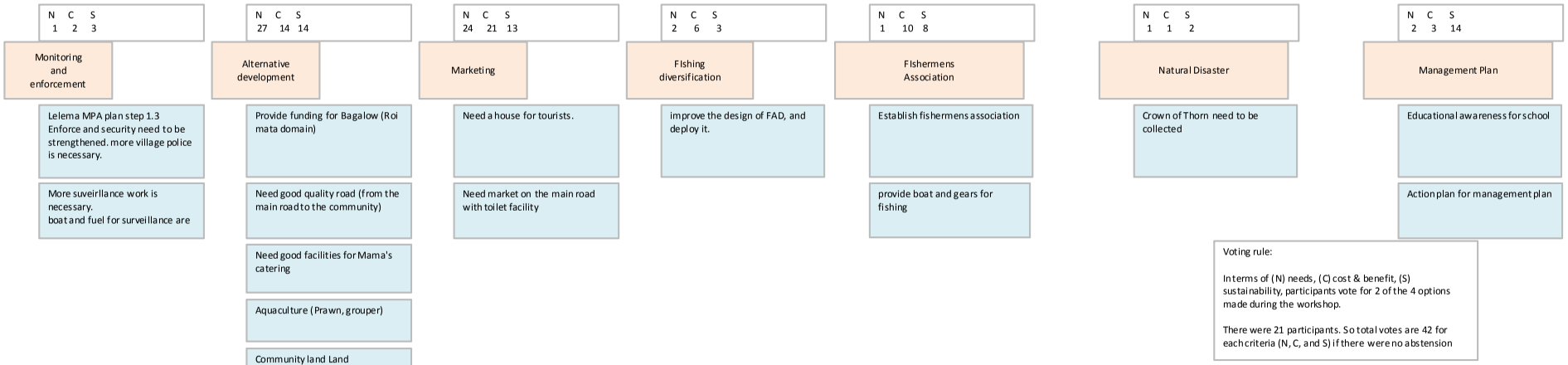
(Malekula)

P S	P S	P S	P S	P S	P S
5 0	8 0	1 10	0 1	6 1	4 1
Climate change	Not enough finance support	Poaching	No respect for fishing rules	Diffculty of management of protected area	Diffciulty in fishing equipment
	vanuatu govt. province, and NGO should give more financial support	Committee must have more meeting to solve the problem	More awareness is necessary for the committee	Need water system for somebay to stay at Crab baytaboo area	need engine repairing training.
	Committee should make more fundraising	If the committee cannot solve the problem, they will go to the police	More Education and awarenss for the community is necessary	Need surveilance boat for the taboo area	VFD need to provide more fishing equipment and gear
		Committee should get the poachers fined		Need ranger who stay at the area and monitor	need more training about fishing technique
				need one truck	

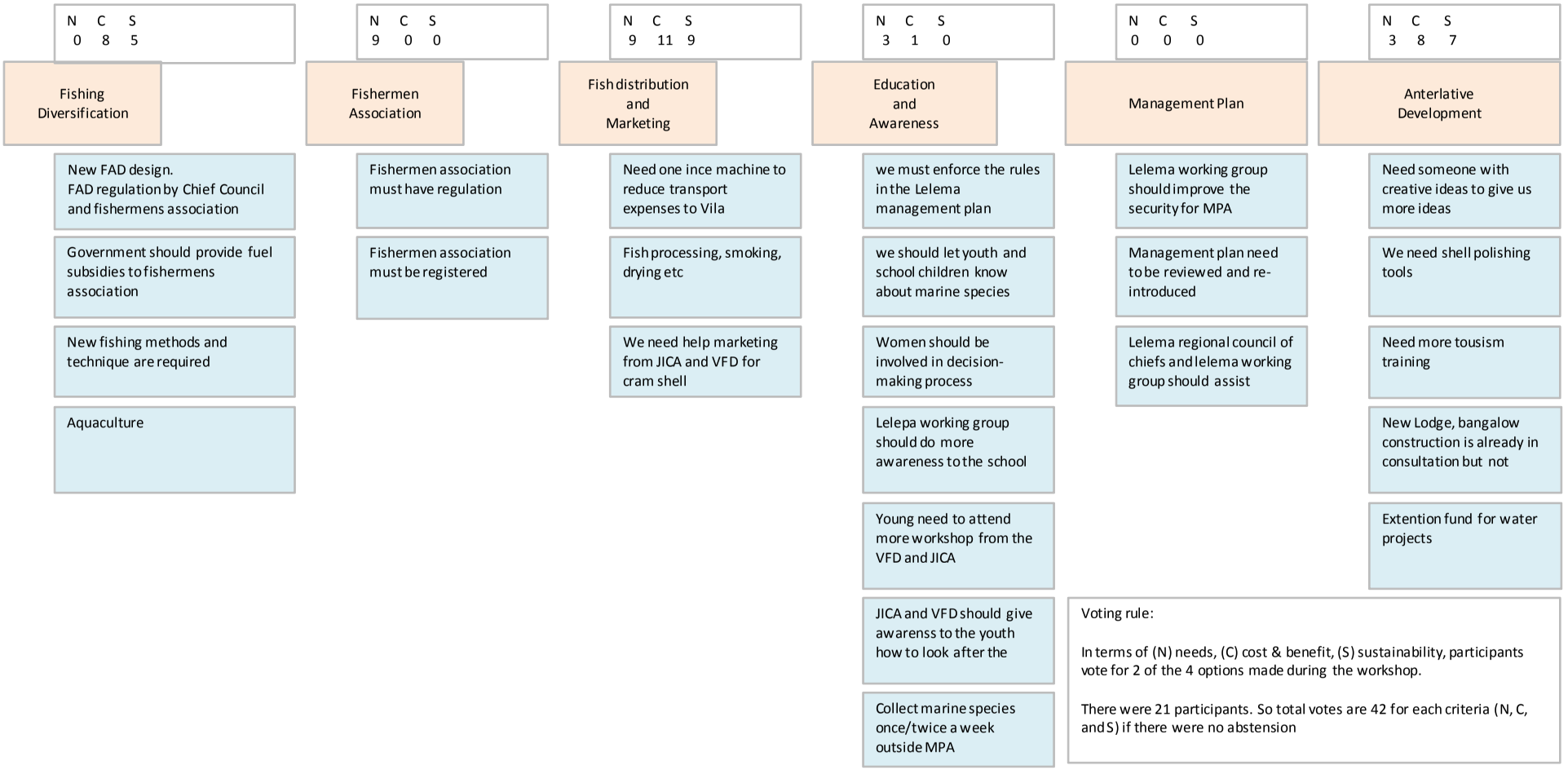
Voting rule:
In terms of (P) problem (S) solution, participants vote for 2 of the 4 options made during the workshop.
Problem means the most serious and important problem for the fisheries resource management
Solution means that it is a solution that they think they can solve

P S	P S	P S	P S	P S	P S
2 1	2 0	0 3	0 3	1 0	0 0
No research and information of fishing ground	Land dispute	Market problem	Destroy of fishing ground	No other alternative means	No fishermen Asssociation
Need funding for new fishing ground	Land claimants should have meeting to solve land dispute between	VFD, MPA committee, and fishermen association should have meeting and come up with one orice for fish, crab etc	Stop ships from anchoring in the taboo area	make Crab Bay as a tourist destination (one day tour, bush trekking	MPA committee should have fishers association
Need funding of new FAD	More awareness should be given from MPA		build warf for the anchorage		
			Need training on how to kill the crown of thorn		

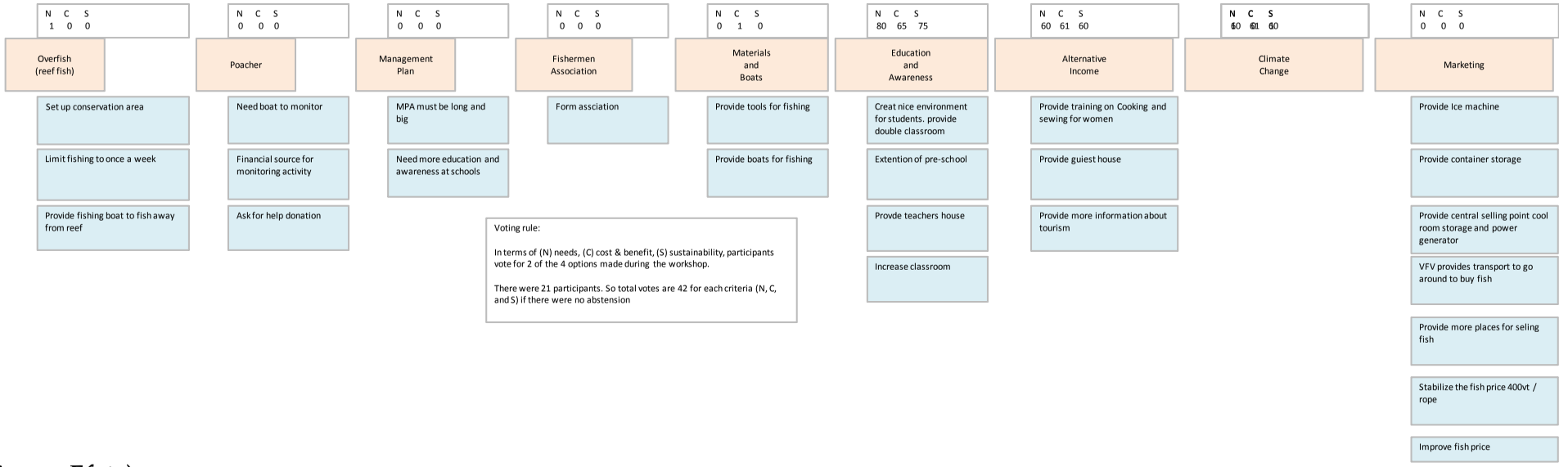
(Mangaliliu, Efate)



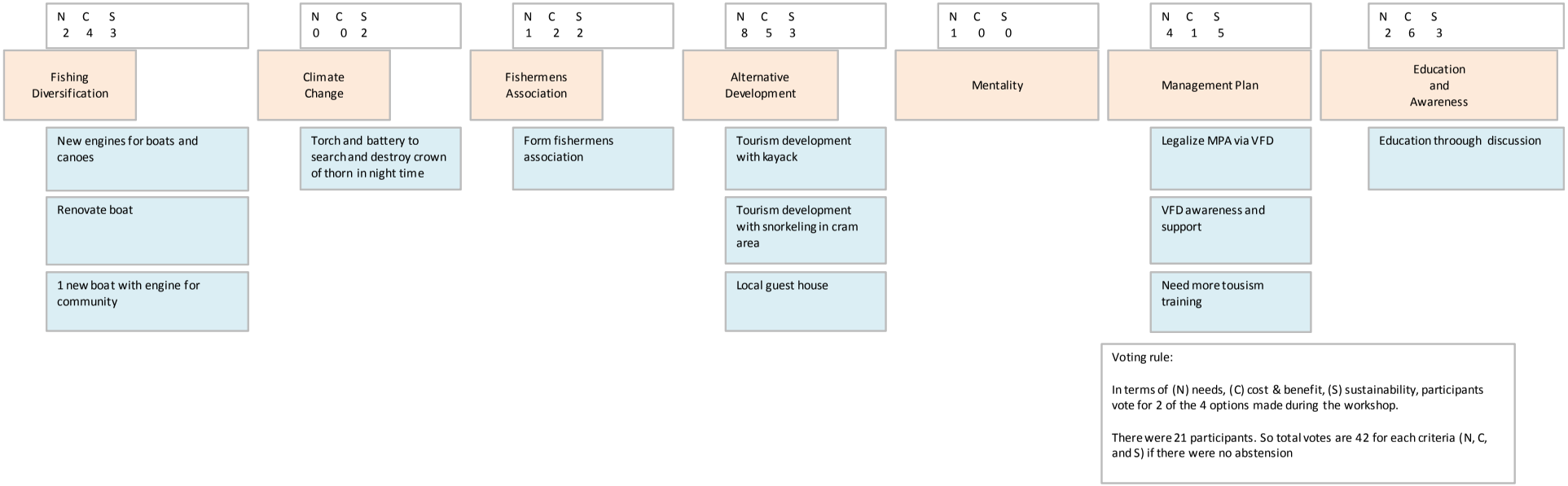
(Lelepa, Efate)



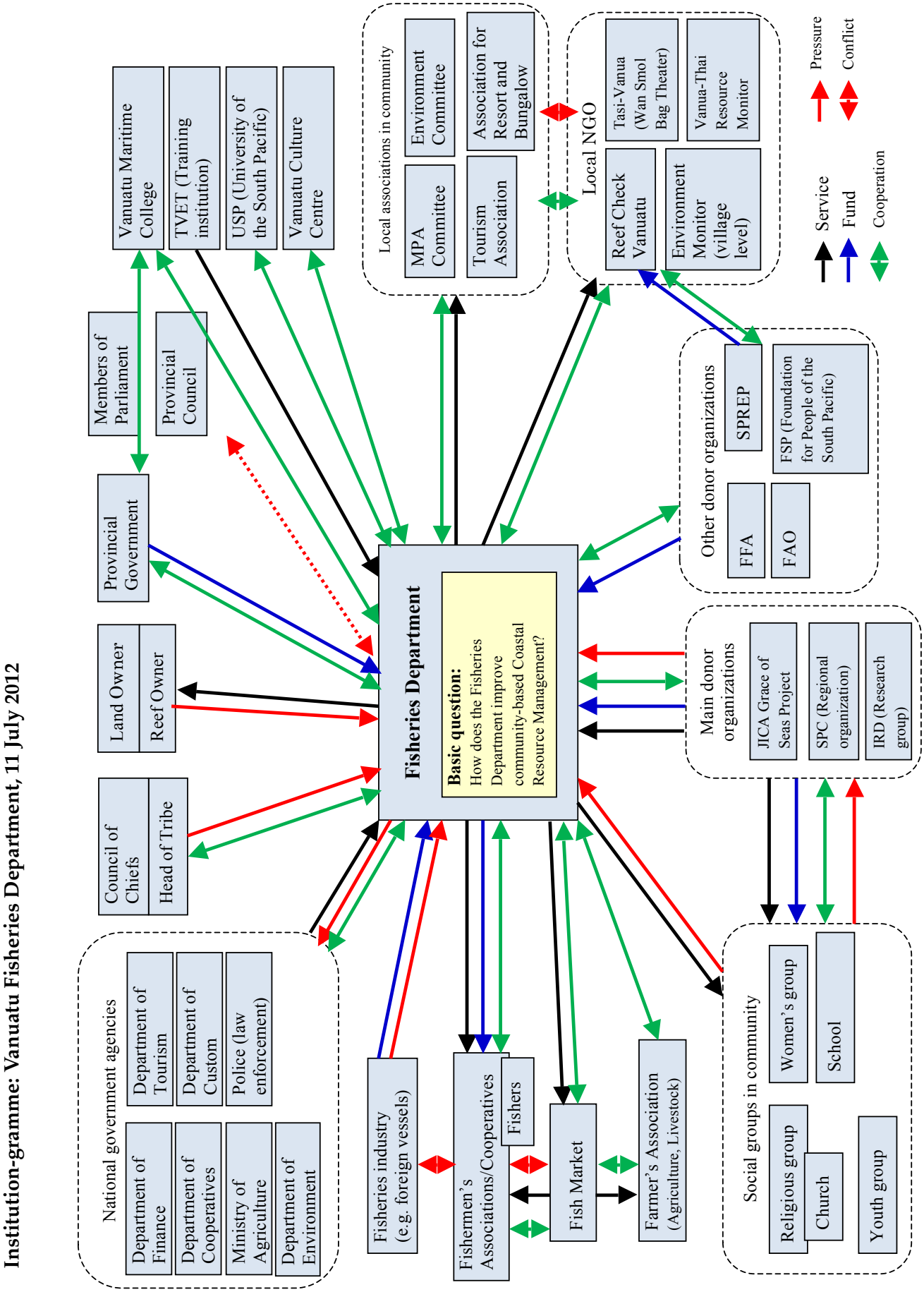
(Tassiriki, Efate)



(Sunae, Efate)

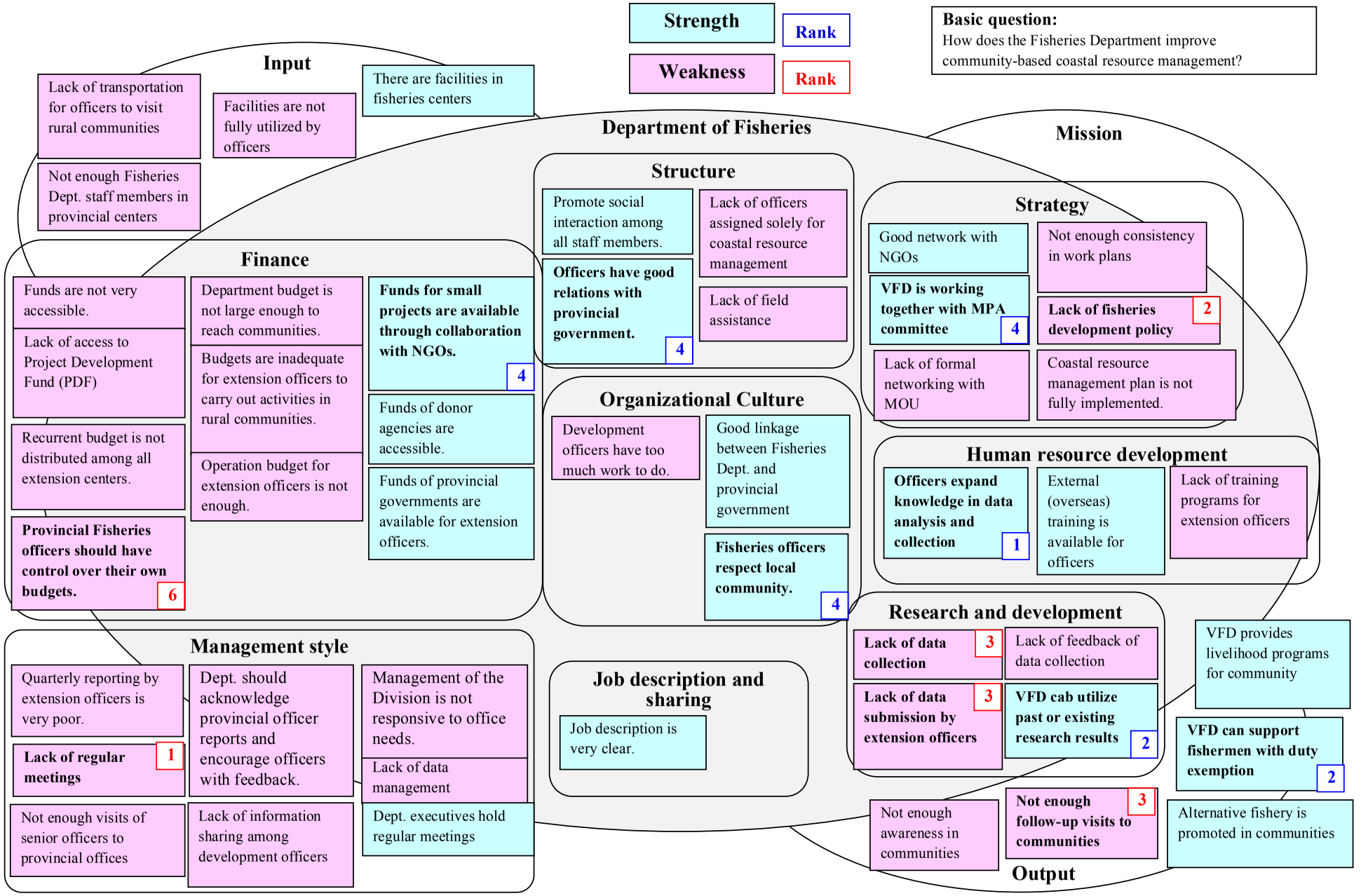


Appendix 5: IDOS (institutional development/organisational strengthening) analysis



External factor analysis, 12 July 2012

Internal factor analysis, 12 July 2012



Strategic orientation: Fisheries Department, Vanuatu, 13 July 2012

Basic question: How does the Vanuatu Fisheries Department (VFD) improve community-based coastal resource management?		**Opportunity**			**Threat**		
		Demand for fish is high	**Fisher associations help Fisheries Department to provide data**	**Traditional governance system is a basis of coastal resource management**	**Fisher association is very slow to be set up in islands**	**Lack of better fish markets in main towns in island**	**Enforcement of community-based coastal fisheries management is limited**
Strength	**Officers expand knowledge in data analysis and collection**	Present fisheries production data to promote local fish sale	Train fishers on data collection system	Deliver knowledge and data to strengthen traditional governance	Explain data collection system to promote organizing fisher associations	Train fishers to collect fish data through fish markets	Raise awareness on fisheries resources through data collection in communities
	VFD can support fishermen with duty exemption	Promote duty exemption programmes to increase fishing activities and production	Encourage fishers to submit GRN on a monthly basis	Increase fishing diversification to enhance traditional management system	Promote Fisheries Dept's support through duty exemption to encourage fisher association registration	Promote financial support to establish fish market outlets	Use duty exemption to enforce coastal resource management
	VFD can utilise past and existing research results	Apply research data to make efficient and valuable fishing methods	Train fishers to utilise new fishing technologies and data collection methods	Present past research results to communities	Conduct stock assessment to estimate quantity of fish resources	Conduct feasibility study to establish fish markets according to past studies	Provide brochures and information of fisheries resource status
	VFD is work together with marine protected area (MPA) committees	Promote to utilise open access fishing areas (non-MPA)	Develop MPA management plan for data collection	Encourage community participation in resource management	Organise fisher associations through MPA committees	Conduct livelihood improvement activities (food security) with MPA committees	Train communities on resource management with MPA committees
	Officers have good relations with provincial governments	Train fishers to promote fish production	Provide fish storage facilities to support fisher associations		Work with provincial government councils to organise fisher association	Seek provincial government subsidies to develop fish markets	Seek provincial assistance for coastal resource management
	External training (overseas) is available for officers	Train fishers to learn new fishing techniques	Improve technical assistance to fisher associations	Raise awareness of fishers and develop a clear base of data collection	Conduct community awareness programmes for organizing fisher associations	Conduct community awareness programmes for fish market systems	Train communities on coastal resource management
Weakness	**Lack of regular meetings**	Hold meetings to discuss fish supply with local fishers	Hold meetings to improve data collection and quality with fisher association	Conduct awareness meetings of traditional governance in target areas	Raise community awareness on fisher association regulations	Improve the submission of monthly audit reports from fish markets	Hold regular meetings to address resource management issues
	Lack of fisheries development policy	Develop coastal fisheries development policy or plan	Improve linkage between fisher association bylaws and fisheries policy	Establish connection between traditional governance system and fisheries policy	Create bylaws of fisher association on provincial fisheries centers	Create bylaws to help develop fish markets; Develop a plan to build new fish markets in every provincial center	Develop a proper policy to empower the community for coastal resource management
	Lack of data submission by extension officers	Improve data submission system from extension officers	Improve data collection from fisher associations	Improve data submission condition to strengthen traditional governance	Set up fisher association for data collection from fishers	Improve data collection on provincial fisheries centers and fish markets	Improve data collection condition for coastal resource management
	Lack of feedback on data collection	Report fish production back to fishers	Report data analysis results to fishers	Utilise traditional networks to improve data submission	Fisheries Dept. officers provides feedback collected data to fishers	Report data analysis results to fish markets	Improve data information dissemination to communities
	Not enough follow-up visits to communities	Contact communities regularly for follow-up visits	Conduct regular visits to fisher associations	Increase follow-up visits to communities	Conduct regular visits to existing fisher associations		Conduct regular visits for community-based management
	Fisheries provincial officers do not control their own budgets	Develop work plan and cost-budget breakdown	Establish network between fisher association and provincial officers	Improve provincial officer capacities to control their budget operation		Monitor provincial budget operation through regular visits by senior officers	Allocate sufficient budgets for community-based management programmes