

## **Third Progress Report**

Project for Promotion of Grace of the Seas for Coastal Villages  
in Vanuatu, Phase 2  
(March 2013)

Japan International Cooperation Agency  
IC Net Limited



## Summary

### 1. Introduction

The Third Progress Report describes the progress of the Project for Promotion of Grace of the Seas for Coastal Villages in Vanuatu, Phase 2 (hereinafter the “Project”) from September 2012 (after the Second Joint Coordinating Committee was held) to the end of July 2013 and the implementation plan of the Project until the end of July 2013.

### 2. Progress and Issues Related to the Project

#### 2.1 Output 1

##### 2.1.1 Improve the management capacity of the VFD in seed production and ranching of marine shellfish

###### (1) Formulation of the management plan for the hatchery facility

The first draft of the management plan of the hatchery facility was reviewed and updated in January and February 2013.

###### (2) Support for the production and release of shellfish seeds

###### Seed production

The Project conducted two spawning trials (one in October 2012 with broodstock TS12, and another in January 2013 with broodstock TS13) for an ocean nursery of giant clam (*Tridacna squamosa*) run by community people. The broodstock TS12 provided 12,000 seeds as of the third month after the spawning. The seed taken from TS13 has not stabilized and is now in the post-larval stage.

The Project conducted a spawning trial for the green snail in October 2012. However, the broodstock did not spawn. The Project will conduct another spawning trial

###### (3) Confirm the current condition of broodstock groups and the addition of new broodstock

The Project planned to survey the current condition of green snail broodstock in Moso Island, the distribution of green snail that had been released and their reproduction in the coastal area of North Efate in March 2013 in cooperation with the Secretariat of the Pacific Community (SPC). However, it has been postponed until May 2013.

The Project confirmed that the giant clam (*Tridacna gigas*) transplanted to North Efate in Phase 1 of the project are in stable condition. Now they are becoming big enough to become a tourism attraction. Upon the request of the community, the Project published a brochure describing the giant clam.

###### (4) Monitoring the released broodstock and seeds

The counterparts and people in the community are regularly monitoring the green snail (*Turbo marmoratus*) and Trochus (*Tectus niloticus*), released by the Project in Uripiv Island in August 2012.

(5) Establishing standard methods for community ranching of marine shellfish

The Project is now carrying out trials on resource enhancement by establishing broodstock grouping for the green snail and trochus.

The Project conducted a preliminary trial of an ocean nursery for the giant clam to ascertain the motivation and capability of people in the community, given that the extension of giant clam aquaculture would enhance natural resources. For this trial, the Project provided seeds of the giant clam (*Tridacna maxima*) and cages for the ocean nursery to selected people living on Moso Island (communities of Tasiriki and Sunae). However, with a few exceptions, the cages for the ocean nursery were not properly maintained. One of the possible causes was the community's lack of clear understanding of the profit that can be expected from the ocean nursery. Hence the next step would be to demonstrate clearly the profitability of the ocean nursery to the community.

(6) Establish the CBCRM plan, including the shell marketing plan

The Project conducted a trial of giant clam (*Tridacna maxima*) aquaculture to ascertain whether it can grow to a harvestable size in six months.

2.1.2 Conduct a participatory coastal fisheries resource evaluation and socio-economic survey in the target areas with the VFD

The Project introduced two record sheets: one for fish catch and the other for fish sales and fishing costs. Using these record sheets, the Project tries to establish the community participatory coastal resource evaluation and monitoring method, as well as a database of collected data and information. To keep collecting data using these record sheets, it is necessary to instruct counterparts and resource management committees in the target communities on data collection and analysis and how to provide feedback to the communities.

2.1.3 Improve the capacity of the VFD to provide coastal fishing communities with technical assistance for CBCRM

(1) Workshop on FAD fishery

The Project introduced the FAD, which is economical and easy even for the community people to deploy. The Project taught the VFD counterparts how to design, construct, and deploy the FAD. Furthermore, the Project instructed the counterparts in how to facilitate the formulation of the draft FAD fishery management plan by the community people. The Project will try to disseminate the

FAD fisheries as a tool for the CBCRM.

(2) Modified canoe

It is essential that fishing operation costs be reduced as much as possible to utilize off-the-reef fisheries resources. The Project conducted a workshop and introduced one type of a modified canoe. The Project will monitor the profitability of fishing operations using the modified canoe.

(3) Data collection by the community in the fishing activities

As explained in 2.1.2., the Project introduced two data record sheets in November and December 2012. In February 2013, the Project held a workshop to monitor the data collection and identify points that need modification. After the data is collected and analyzed, the VFD counterparts and the members of resource management groups in the target areas are expected to provide feedback to the community to promote awareness on the importance of resource management and continuous data collection by the community.

## 2.2 Output 2

### 2.2.1 Conduct a participatory baseline survey at target sites

(1) Conduct a participatory baseline survey (coastal fisheries resource evaluation and socio-economic survey) at target sites

#### Introduction of data record sheet on the fishing activity

The Project provided the data record sheet on fishing activity to FAD management committee and started a trial for data collection. Then the Project conducted a monitoring workshop at three target sites (Efate, Malakula, and Aneityum) to discuss possible improvements in the data record sheet and ways to consolidate the collected data. Currently, the motivation and level of data collection varies depending on the sites. Therefore, the VFD counterparts need to provide community resource management groups with feedback on the collected data to raise awareness on the importance of resource management and continuous data collection.

### 2.2.2 Strengthening the community organization and formulation of the coastal fisheries resource management plan

(1) Supporting and strengthening the organization of coastal fishing communities

The Project facilitated efforts to strengthen the organization in the target areas through workshops on various topics such as FAD, modified canoes, and the formulation of a coastal fisheries resource management plan.

The VFD counterparts recognized that appropriate tools such as Problem Analysis can facilitate

communication among the participants, and contribute to organizational strengthening in the communities.

In particular, the Project conducted a workshop on coastal resource management planning with the participation of representatives from all the target areas. The workshop participants found it to be an important opportunity to promote mutual understanding among different communities and regions and to disseminate CBCRM.

#### (2) Formulate draft CBCRM plans in the respective target areas

The Project conducted a workshop on coastal resource management planning on February 18–22, 2013, at the VFD conference room in Port Vila. The representatives from all the target sites participated in the workshop and formulated the draft CBCRM plans. The representatives gave presentations of their own action plans (Efate, Malakula, and Aneityum) and discussed the plans with one another. The workshop participants strengthened their planning capacity by formulating the draft CBCRM plan by themselves with a certain degree of logical analysis.

#### 2.2.3 Implement the trials for the CBCRM plan with the VFD at target sites

The Project started the trials at each target site based on the framework approved in the Second Joint Coordinating Committee (JCC) in September 2012.

##### Aneityum

In order to reduce fishing pressures on lobster, the following activities have begun with the initiative of the members of the community resource management committee.

- Development of FAD as a tool in diversifying fishing efforts and strengthening organization among fishermen
- Demonstration of shell polishing and preliminary survey for seafood cooking to offer tourists visiting Mystery Island as a tool for alternative income generation, primarily for women
- Introduction of fishing activity record sheet to grasp the issues regarding data collection and to build up the data collection system

##### Malakula

Currently, the community resource management committee manages primarily land crab. Originally, there were plans to strengthen the financial base of the committee and expand the management species from only land crab to other species. However, participants from Malakula for the coastal resource management planning workshop agreed that it is better to focus first on

strengthening the land crab management. Accordingly, the Project conducted the following activities.

- Development of FAD as a tool for fund generation, fishing effort diversification, and organizational strengthening for fishermen associations and community resource management committee
- Community participatory monitoring on the released green snail and trochus in Uripiv Island aimed at raising awareness on the importance of resource management among the community
- Introduction of a fishing activity record sheet to grasp the issues regarding data collection and to build the data collection system

#### Efate

The Project conducted the following activities to strengthen the community resource management committee and disseminate management measures.

- Development of FAD as a tool for fund generation, fishing effort diversification, and organizational strengthening for fishermen associations and community resource management committee
- Workshop on a modified canoe and field test of the modified canoe for the fishers in Mangaliliu and Lelepa
- Ocean nursery trial of giant clams in the two communities in Moso Island, Sunae and Tasiriki
- Introduction of a fishing activity record sheet to grasp the issues regarding data collection and build the data collection system

#### Issues

The implementation of the Project so far helped the Project members understand that it is not within the capability of the community and its resource management committee to conduct various activities at the same time within a limited time frame. Therefore, it is important to select the number and contents of activities to match the initiative and capability of the community.

Among the four target communities in Efate, Sunae and Tasiriki have been difficult to motivate and create commitments for resource management ever since Phase 1 of the Project started. It is difficult to formulate a common resource management plan for all four target communities within the time frame of the Project implementation.

### 3.1 Field visit by a JICA Fiji officer

A JICA Fiji officer and a Japanese expert assigned at the University of South Pacific (USP) visited Aneityum island and observed the workshop on FAD.

### 3.2 Collaboration with related organizations

SPC is to send an expert on green snail seed production and surveys on natural green snail stock in May 2013. In order to build collaborative relationships with other departments of the Vanuatu Government, a representative of the Department of Cooperative and Ni-Vanuatu Business was invited to visit Aneityum and Mystery islands in March, together with the Project members.

### 3.3 Publication of the Project

- The Project designed a T-shirt with the logo of the Project and the VFD in November 2012.
- The Vanuatu TV station and newspaper (Daily Post) covered the activities of the Project in January 2013.
- The Project provided a brochure on the giant clam (*Tridacna gigas*) transplanted from Tonga to Vanuatu (North Efate) for tourists in February 2013.
- The Project made a calendar with photos of activities in February 2013.

## 4 Activities Planned for the Period from March 2013 to July 2013

### 4.1 Improve the capacity of the VFD in managing seed production and ranching of marine shellfish

#### (1) Formulation of the draft hatchery management plan

The Project reviewed and updated the existing management plan in February 2013. The Project will implement the activities based on the plan, and will review and update it again in December 2013.

#### (2) Support the production and release of the shellfish seeds

##### Production of seeds

The Project plans a spawning trial for green snails in May 2013 (and October 2013 if the first trial fails). As for the giant clam (*Tridacna squamosa*), TS13 will be available as seeds in May 2013. After that, the production of giant clam seed production will be considered in light of the performance of TS13 broodstock.

##### Release of the shellfish seeds

The Project has no plans for the additional release of shellfish seeds. However, 34 broodstock of green snail kept at the VFD hatchery will be released into the natural environment after the spawning trial.



(3) Monitoring the impact of released broodstock

In collaboration with SPC, the Project plans to conduct a baseline survey in May 2013 to look into the dispersion of the released green snail in North Efate and the current condition of the group of green snail broodstock in Moso Island. In addition, the Project plans to conduct a detailed survey in August 2013 on the trochus and green snail released in Uripiv Island and a mid-term evaluation on the impact of released shellfish.

(4) Monitoring the released seeds and broodstock

The Project will consider the monitoring method for the green snail in North Efate based on the survey result of SPC and IRD. The Project will decide on a monitoring method for the green snail and trochus in Uripiv Island based on the results of the detailed survey planned for August 2013.

(5) Development of standard marine shellfish stock enhancement method by community

The Project will continue the stock enhancement trial by the broodstock aggregation for green snail and trochus to decide on a comprehensive resource management method that can be administered by communities.

(6) Development of the marine shellfish marketing plan by community

The Project plans to start ocean nursery trials for the giant clam (*Tridacna squamosa*) TS12 with motivated community people and to harvest and sell it in November 2013. The selection of the community people may not be restricted to the target communities of the Project. The marine shellfish marketing plan by the community will be developed based on the results of this trial and the experience gained in Phase 1 of the Project.

4.2 Improve the VFD's capability to implement a baseline survey and analyze results

(1) Examine and update the survey method and database format

The Project will update the data record sheet for the fishing activity if necessary. In addition, the Project will introduce the database format and consider the issues and countermeasures so that the resource management committee can utilize it without problems.

4.3 Improve the capacity of the VFD to provide coastal fishing community with technical assistance for CBCRM

(1) Design and deployment of FAD

The Project will support the VFD's initiative to introduce FAD for fishing community. Moreover, the Project will conduct training on portable GPS and eco-sounder to enhance the capability of FAD fishing operations.

(2) Fishing method for FAD

The Project will conduct training on the design, construction, and fishing operation of new fishing methods such as drop lines to promote the utilization of FAD by community people.

(3) Data collection sheet on fishing activity

The Project will conduct a workshop for the VFD counterparts on the analysis of the collected data, and on the presentation of the results of analysis for the community.

(4) Value-added fishing products and introduction of alternative income sources

The Project will improve the capability of the VFD counterparts on fish processing, marketing, and shell polishing products through on-the-job training.

4.4 Implement trials for the CBCRM plan with the VFD

The Project will support the community and the VFD in implementing the coastal fisheries resource management plan to strengthen the management capability of the resource management committees.

4.5 Monitoring and evaluation of the implementation of the CBCRM plan with the VFD

The Project will consider the indicators for the Project Design Matrix (PDM) based on the CBCRM evaluation sheet and the results of the baseline survey.

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## 1. Introduction

The Third Progress Report describes the progress made in the Project for Promotion of Grace of the Seas for Coastal Villages in Vanuatu, Phase 2 (hereinafter the “Project”) from September 2012 (after the Second Joint Coordinating Committee was held) to the end of February 2013 and the Project implementation plan until the end of July 2013 (refer to the Appendix 1 for the implementation plan)

## 2. Progress and Issues Related to the Project

### 2.1 Output 1

#### 2.1.1 Improve the management capacity of the VFD in seed production and ranching of marine shellfish

##### (1) Formulation of the management plan for the hatchery facility

##### Management plan for the hatchery facility

The Project made the first draft of the management plan for the hatchery facility in July 2012. The Project activities have been undertaken based on the plan by the VFD counterparts even in the absence of the Project members. The Project reviewed and updated the plan in January and February 2013 in order to adjust to changes in seed production activity (refer to the Appendix 2 for the plan).

##### Maintenance of the hatchery facility

Based on the management plan of the hatchery facility, the VFD repaired the water drain of the concrete water tank. However, it was a temporary treatment and the water drainage problems still remain to a small extent. All the water will have to be drained in order to make a complete repair. However, all of the water tanks are occupied by shellfish, making it difficult to drain the water. A proper water tank has to maintain a slope of a certain degree to completely drain the water. However, complete drainage is not possible because part of the base on which the water tanks were built is sinking. This may be causing the high mortality of the larval period of shellfish seed production. Hence, the slope of the water tank should be maintained properly.

##### Pump and water inlet facility

Currently, the water inlet facility is operating properly. However, there is no backup system. If an accident happens, the sea water supply will be interrupted and the risk of losing all the animals in the hatchery would be high.

The Project has made repeated requests to the VFD for improvements. The VFD has repaired the pump and water distribution system, but it is slow and does not completely resolve the problem. It is strongly recommended that the Project provide a water pump for the backup for the sake of risk management.

In the bad weather in December 2012, one out of two water inlets was dismantled. As this outlet was

not functioning properly even before the dismantlement, it was closed to prevent unnecessary sea water coming into the hatchery. For now, the water supply through just one inlet is enough. However, currently the fresh water aquaculture occupies about 30% of the facility. If all the water tanks need a supply of sea water, the sea water supply through just one inlet would not be enough.

(2) Support the production and release of shellfish seeds

Seed production of giant clams

The spawning trial for the giant clam (*Tridacna Squamosa*) was carried out by the VFD counterparts in October 2012. The VFD staff has collected ten additional broodstock from Uri Island in Malakula. Two spawning trials were carried out. The first trial produced 17 million fertilized eggs and went through the larva stage without major problems. The second trial was not very successful<sup>1</sup>. In January 2013, the Project confirmed 12,000 seeds of three months old. Twenty thousand seeds will be necessary for the activities in the future. Therefore, an additional spawning trial was conducted in January 2013. The trial was successful and 22 million fertilized eggs were produced. The VFD counterparts took the initiative in carrying out the trial, and the Project members just monitored the process. The technique that VFD counterparts applied for the larva rearing had some problems. However, more practice will improve the problems.

The giant clam (*Tridacna maxima*) TM11 is not suitable for release for two reasons. One is that there is no established release method, and the other is that TM11 includes mixed species that do not exist in the natural environment. The VFD hatchery holds a large amount of seed stock. The Project is trying to market the seeds of giant clam for consumption. There is no case in which small giant clam seeds one year of age have found a market for consumption. This trial is completely new.

Seed production for green snail and trochus

The VFD counterparts conducted a spawning trial for green snail in October 2012, but it did not produce fertilized eggs.

The broodstocks of green snails were taken from Mangaliliu, out of which 17 died after the spawning trial. The Project has determined that the main cause of death is excessive stress suffered by the broodstocks of green snail during the spawning trial, and it is not desirable to continue the spawning trial by only the VFD counterparts at the current technical level. To avoid further mortality of the broodstocks of green snail, the Project stopped all additional spawning trial. A survey on the survival rate of the released stock of green snail (and amount of reproduced green snail) must be carried out to estimate the allowable amount of broodstocks for additional spawning trials.

The VFD hatchery keeps trochus to clean the water tanks in the hatchery. The Project confirmed

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<sup>1</sup> All died at the larva stage. The possible cause of death is salinity in the hatchery due to the rainfall.

natural spawning in numerous water tanks in the hatchery in January 2013. Moreover, there are seeds of trochus estimated to be a few months old in the hatchery. Thus the Project has not targeted trochus for seed production so far. However, the hatchery needs now a large amount of small trochus to clean the water tanks for the seeds of giant clams. Hence, the Project conducted a spawning trial for trochus on February 20–22, 2013. The trial provided 0.8 million fertilized eggs. The project has moved approximately 100,000 individuals into the water tanks for TS13.

#### Release of the seeds

The Project plans no activities at this moment.

### (3) Monitoring of the released broodstock and their reproduction

#### Green snail

In February 2013, the Project found two young green snails (by 30 minutes of search by swimming) on the west side of the reef in front of Mangaliliu, where the broodstock group of green snail has been established in Phase 1 of the Project. This means that one young green snail is found out of every six broodstocks of green snail. Although the evidence is not complete, it is highly likely that the broodstocks of green snail are reproducing. The Project and the VFD requested that SPC collect and analyze scientific data and information on the green snail released in North Efate. The result will be a valuable foundation for considering the monitoring method for the VFD and the community.

#### Trochus

The Project also searched for the distribution of trochus in the reef in front of Mangaliliu. There were only two old trochus, assumed to have been released by the Project. There are many trochus on the east side of the reef in front of Mangaliliu, including small ones. There is a possibility that somebody has moved trochus from the west to east side of the reef. IRD has published the results of the stock assessment of trochus in the taboo area in front of Mangaliliu. The data and recommendations in their report are very important. However, some of the results seem different from what the Project members actually observed in the field.

### (4) Monitoring of the released marine shellfish (including broodstock and seeds)

#### Green snail and trochus

The Project released green snail and trochus in Uripiv Island in August 2012. The VFD counterparts and community people conducted a recapturing survey in September and November 2012. In February 2013, Project members joined the survey, established 50 meters of permanent transects, and conducted monitoring over 1,000 square meter area. The results showed that the released marine shellfishes have disappeared from the point of release, indicating that they have dispersed throughout

a wider area. Considering that they tend to move vertically, they might have moved into a deeper area. A survey must be conducted in the deeper area to draw conclusions on the impact of marine shellfish release.

#### Giant clam

The Project released 67 giant clams (*Tridacna squamosa*) TS07-2 on a tourist beach in July 2012. Out of the 67, 58 had survived as of January 2013. It is highly likely that the lost giant clams have been taken away by somebody, as only one dead shell was found on the beach. The Project explained to the tour operators to closely watch and monitor the behavior of the tourists.

The Project confirmed that the giant clam (*Tridacna gigas*) transplanted to North Efate in Phase 1 of the Project are in stable condition. Now they are becoming big enough to serve as a tourist attraction. Upon the request of the community, the Project published a brochure to explain the giant clam. However, the number of giant clams is gradually decreasing on Moso Island (Tasiriki and Sunae). It is likely that community people are taking away the shell, as empty shells have not been found<sup>2</sup>. It is important to raise awareness among the community people through the distribution of the brochure prepared by the Project on this species.

#### (5) Establishing standard methods for community ranching of marine shellfish

The Project is now implementing trials on resource enhancement by establishing broodstock grouping for the green snail and trochus.

In North Efate, the stock released in Phase 1 of the Project seems to be contributing to stock enhancement. In Uripiv, more time is necessary as the marine shellfish were recently released. It is necessary to accumulate enough information and data to understand whether the shell release can be an effective tool in resource management.

The Project conducted the preliminary trial of the ocean nursery for the giant clam to check the motivation and capability of community people, believing that the extension of giant clam aquaculture would enhance the natural resource conditions. For this trial, the Project provided seeds of giant clam (*Tridacna maxima*) and cages for the ocean nursery to selected community people in Moso Island (communities of Tasiriki and Sunae). However, with a few exceptions, the cages for the ocean nursery were not properly maintained.

The giant clam (*Tridacna squamosa*) TS07 seems to be sexually matured and will likely spawn in the near future, as is the case with the giant clam (*Tridacna gigas*). Asking the community people to look after the group of broodstock in front of their community may be the most practical way of managing the resources. Compared with other countries in the Pacific region, the poaching problem

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<sup>2</sup> The shells of the giant clam (*Tridacna gigas*) were found on sale for tourists.

is not so severe in Vanuatu, indicating that their awareness of resource management is relatively high.

(6) Establish the CBCRM plan, including the shell marketing plan

The Project is providing an ocean nursery for the giant clam. The Project conducted the mid-term evaluation for the ocean nursery of *Tridacna maxima* in February 2013. The Project stopped the trial in the community of Tasiriki after confirming that none of the giant clams in the cages for the ocean nursery (three out of five family units) had survived. In the community of Sunae, three out of five family units for the ocean nursery let all the giant clams die in the cages. Two family units managed to maintain the cage in good condition. The Project members have determined that the direct cause of this failure to survive in the cage can be attributed to the invasion of carnivorous shellfish (*Cymatium*) into the cage. This shellfish is common in the natural environment. However, with regular cleaning, it is possible to prevent most mortality. This indicates that the majority of the selected families failed to provide proper maintenance and care for the ocean nursery<sup>3</sup>.

The techniques for administering an ocean nursery are established. The key for success is the selection of a suitable place and people with a sense of commitment. The Project will conduct further trials with *Tridacna squamosa*, which is in high demand in the aquarium fish market, to develop a shellfish marketing plan.

2.1.2 Improve the VFD's capability to implement a baseline survey and analyze results

(1) Develop participatory methods for coastal resource evaluation and monitoring, applied with the standard research methods of the Pacific region

The Project introduced data record sheets for fishing activity in the workshops on FAD fishing held during November and December 2012 to collect the information needed to promote CBCRM. The record sheets consist of two different sheets (refer to Appendix 3). The purpose of these sheets is for the community people to gain an objective understanding on the condition of the resource they exploit, and also the economic performance of the fishing activity. The record sheet for the fishing catch is intended to motivate community people to manage their coastal resources voluntarily.

The record sheet for fishing costs and income aims to build the capacity of community people to understand the economic performance of fishing activities.

The key for data recording lies in motivating the community people to record data and establishing a

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<sup>3</sup> If the VFD were able to provide more regular visits and advice to the community people, the failure might have been avoided. However, *Tridacna maxima* has no use but for self-consumption and the trial was meant as practice for the next trial with *Tridacna squamosa*.



data collection system. To motivate community people, it is important to provide them with feedback on the collected data. For this purpose, the VFD and the community resource management committee will have to collect and analyze the data, and prepare a presentation for the community people. Providing certain incentives to the collaborator for the data collection may be another option.

The appropriate way of establishing the data collection system may vary depending on the site. The Project will closely consult with the community people and resource management committee to determine the most appropriate way.

2.1.3 Improve the capacity of the VFD to provide coastal fishing community with technical assistance for CBCRM

- (1) Hold a training program on proper approaches to CBCRM
- (2) Hold a training program on supporting CBCRM

#### Workshop on FAD fishing

The Project aims to reduce the fishing pressures in the reef by introducing FAD. The fishing ground for FAD is out of the reef and sometimes far from the shore. FAD fishing requires more time and money and also involves a greater risk of poor weather conditions compared with the traditional reef fishing. The basic concept of FAD introduced by the Project is less costly and is easier to deploy and maintain even by the community people<sup>4</sup>.

The Project conducted the workshop on FAD fishing in the three target sites during November and December 2012. One workshop took five days, covering everything from the introduction of basic knowledge on FAD to practice on the construction, deployment, and formulation of FAD management rules. Participants maintained good concentration throughout the workshop. The draft FAD management plan included various topics, such as the generation of funds to maintain the FAD, awareness raising, improved communication with related stakeholders, and demarcation among the members of the FAD management committee (refer to Appendix 4 for details).

The key for successful FAD management is to put the management plan into practice.

#### Workshop on modified canoe

As stated above, the fishing ground for FAD is outside of the reef. A boat with an engine is indispensable to access the FAD. Currently, the number of people in the community with such a boat is very limited<sup>5</sup>. Thus the Project conducted a workshop on how to modify and make the existing

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<sup>4</sup> FAD commonly used in the South Pacific Region is strong but costly. It is very difficult for the community people to procure the necessary materials and deploy them using their own boats.

<sup>5</sup> The most common boat in the community is a small canoe without an engine or sail. Accessing the FAD even only five miles off

canoe accessible to offshore fishing grounds. To reduce the operating costs, the modified canoe is equipped with a sail to navigate. Other points of modification are as follows (refer to the Appendix 7).

- Installation of the center board for better stability of the canoe
- Installation of aol clutch for better maneuverability

The VFD counterpart in charge of extension in Efate and the engineering joined the workshop and learned about the modification technique (refer to the Appendix 5 for the details). The key for the successful introduction of the modified canoe is to demonstrate the profitability of fishing operations with the canoe.

## 2.2 Output 2

### 2.2.1 Conduct a participatory baseline survey at target sites

(1) Conduct a participatory baseline survey (coastal fisheries resource evaluation and socio-economic survey at target sites)

#### Introduction of data record sheet on the fishing activity

The Project provided the data record sheet on fishing activity to the FAD management committee and started a trial for data collection (refer to the Appendix 2 for the data record sheet). Then the Project conducted the monitoring workshop at three target sites (Efate, Malakula, and Aneityum) to discuss the possible improvements to the data record sheet and the way to synthesize the collected data. Currently, the motivation and level of data collection varies depends on the sites. Therefore, it is necessary that the VFD counterparts provide the community resource management group with feedback on the collected data to raise awareness on the importance of resource management and continuous data collection.

### 2.2.2 Strengthening the community organizations and formulation of the coastal fisheries resource management plan

(1) Supporting and strengthening the organization of coastal fishing communities

In the target sites, there are existing organizations of the coastal fishing community, such as resource management committees and fishermen associations. However, they are not active and few activities are carried out. The FAD management committee, established through the introduction of FAD by

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the shore is difficult in this type of boat.

the Project, consists of the members of the resource management committee and leading fishermen in the community. It is expected that the FAD committee will not only manage the FAD, but promote CBCRM.

(2) Formulate draft CBCRM plans at the respective target area

Workshop on the CBCRM plan

The Project conducted a workshop on coastal resource management planning on February 18–22, 2013, at the VFD conference room in Port Vila. Representatives from all the target sites participated in the workshop, and formulated the draft CBCRM plans (refer to the Appendix 6 for the details).

Participants set the core problem as “why the existing resource management plan is not functioning well,” and analyzed the causes and solutions from the perspective of organization/governance, resource management plan, and supporting activities. An outline of the results is as follows.

1) Aneityum

i) Relationship between MPA committee and tourism committee

Currently, the tourism committee provides financial support for two out of the six members of the MPA committee. The other four members of the committee feel that it is unfair that they are not paid. The workshop participants recognized that these two committees share Mystery Island as a tourism resource, but have not yet built an appropriate cooperative relationship. The participants believe that there is not enough information sharing between the tourism committee and the MPA committee, and the members of the tourism committee do not have a good enough understanding of the activities of the MPA committee. The MPA committee developed their activities based on the resource management plan developed in collaboration with the VFD, the Foundation of the Peoples of the South Pacific International (FSPI), and the Coral Reef Initiative for the Pacific (CRISP). However, the participants think that the content of the resource management plan is too specific, activities are not prioritized, the responsible person for each activity is not well defined, and there is not enough resource monitoring. As countermeasures, the participants proposed prioritizing the activities in the resource management plan, defining the responsible persons in charge of each activity, and reporting continuously on the monitoring information (data record sheet for fish catch, lobster harvest, and reef check) to the tourism committee.

i) Awareness raising in the community

The participants pointed out that the community’s awareness of the MPA committee’s activities is low. As a solution, participants proposed conducting awareness activities in Bislama, building awareness through role play, and awareness activities in each of the six sub districts in Analcauhat.

iii) Livelihood improvement as a means to reduce fishing pressure in reef area

Participants recognized that the lack of alternative income sources is one of the causes of the fishing pressure in the reef. To improve the situation, participants proposed solutions such as the development of FAD fishery, building a fishing center, and obtaining duty exemptions on fuel through the establishment of fishermen associations.

2) Malakula

i) Awareness raising for the members of MPA committee and the community

The participants from Malakula think that the existing Crab Bay resource management plan is well designed and needs no changes.

On the other hand, the MPA committee consists of representatives from 16 communities. These 16 communities are scattered around, making it difficult for all the members to meet. Participants consider that respect for the MPA is gradually decreasing 10 years after the management plan was devised.

ii) Support for livelihoods

Participants proposed an additional deployment of FADs and training on the fishing methods around FAD as a mean to reduce the fishing pressure on the land crab. They also suggested developing Crab Bay as a yacht mooring place and charging a mooring fee as a part of tourist development. If funds are generated through these activities, the MPA committee would be able to develop resource management activities.

3) North Efate

i) Comprehensive resource management plan

In Phase 1 of the Project, a comprehensive resource management plan was developed for four communities (Mangaliliu, Lelepa, Tasiriki, and Sunae). However, Tasiriki and Sunae dropped out of the plan because of a land dispute. During the workshop, the representative from Sunae proposed devising another comprehensive resource management plan for all four communities. It would be ideal if the four communities could manage their resource together. However, there is a considerable gap among communities in terms of their commitment to the resource management and the Project. Excessive promotion of a comprehensive resource management plan for Efate may harm the relationship among the four communities and thus requires careful consideration.

ii) Enforcement

The participants believe that resource management in North Efate is influenced by poachers from

outside and a Westernized lifestyle due to its closeness to Port Vila, the capital of Vanuatu. They proposed to strengthen awareness in the community for better enforcement of resource management.

After the analysis, participants from each site (Efate, Malakula, and Aneityum) presented their draft action plan and discussed it with one another.

Island	Community	Date	Opinion from community people	Activities to be developed
Moso	Sunae	Feb. 27, 2013	Community people will review the content of the action plan and consider detailed activities.	Tasiriki and Sunae develop its own resource management plan. Mangaliliu and Lelepa will make one common resource management plan, as with its existing management plan. One general and comprehensive resource management plan for all of the four communities may be considered after the meeting among the representatives from the four communities.
	Tasiriki		It is better to organize workshops to make community people more interested and motivated to carry out the activities of the Project.	
Efate	Mangaliliu/ Lelepa			
Aneityum	Analcauhat	March 4, 2013		
Malakula	Lakatoro			

The new draft action plan for resource management is devised with the initiative of the representatives of the community, even though its logical structure needs some improvement. The communities are expected to brush up the draft action plan through implementation and monitoring, with the support of the VFD and the Project.

#### Issues and countermeasures

It seems too early to devise one general and comprehensive resource management plan for all four target communities in Efate<sup>6</sup>. During the workshop, participants developed a common action plan for all four communities in Efate. However, it does not seem to be very feasible. The problem with the existing resource management plan is that the activities in the plans are not carried out. To improve the plan, it is important to make the plan detailed and specific so that it is matched with the situation and interests of each community.

A comprehensive resource management plan will be the next step in the future. The Project is

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<sup>6</sup> The participants from Moso Island (Tasiriki and Sunae) expressed their feeling that it is unfair that their communities were excluded from Phase 1 of the Project because of the land dispute, and that workshops are frequently held in Mangaliliu and Lelepa but not in Moso Island. The participants from Mangaliliu and Lelepa did not express their opinion during the workshop. However, individual conversations revealed that the participants from Mangaliliu and Lelepa are not satisfied with the opinion of the participants from Tasiriki and Sunae. The characteristics of the four communities differ in terms of population and interests. Solving the unfairness that representatives from Tasiriki and Sunae feel may cause a feeling of unfairness among the people in Mangaliliu and Lelepa.

considering providing an opportunity for the chief representatives from the four communities to meet and discuss the resource management plan<sup>7</sup>.

### 2.2.3 Implement the trials for the CBCRM plan with the VFD at target sites

- (1) Hold a training program on proper approaches to CBCRM
- (2) Hold a training program on supporting CBCRM

The Project started the trials at each target site based on the framework approved in the Second Joint Coordinating Committee (JCC) held in September 2012.

#### Aneityum

In order to reduce fishing pressures on lobster, the following activities were started at the initiative of the members of the community resource management committee.

- Development of FAD as a tool for fishing effort diversification and strengthening of fishermen organization
- Demonstration of shell polishing for interested women in the community as a first step for the diversification of alternative income sources<sup>8</sup>
- Preliminary survey of seafood cooking to offer tourists visiting Mystery Island<sup>9</sup>
- Awareness raising on the importance of coastal resource management with a movie showing
- Introduction of a fishing activity record sheet to grasp the issues regarding data collection and to build the data collection system

#### Malakula

The Project had planned to strengthen the financial base of the committee and expand management species from only land crab to other species. However, participants from Malakula for the coastal resource management planning workshop agreed that it is better to focus first on strengthening the land crab management. Accordingly, the Project conducted the following activities.

- Development of FAD as a tool for fund generation, fishing effort diversification, and organizational strengthening for fishermen associations and community resource

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<sup>7</sup> Infrastructure is developing very rapidly in the North Efate area. In 2011, the ring road around Efate Island was completed. Work to expand the electricity network was ongoing as of 2013. In conjunction with the development of infrastructure and tourism, there are an increasing numbers of land disputes. Tourism development may contribute to coastal resource management, as in Aneityum. The need for communication and collective action among the four communities may increase in the future.

<sup>8</sup> The demonstration is done by the VFD counterpart who participated in the training in Japan organized by JICA.

<sup>9</sup> The preliminary survey was done by the senior volunteer of JICA working in Port Vila.

management committees

- Community participatory monitoring on the released green snail and trochus in Uripiv Island aimed at raising awareness on the importance of resource management in the community
- Introduction of a fishing activity record sheet to grasp the issues regarding data collection and to build the data collection system

### Efate

The Project conducted the following activities with the purpose of strengthening the community resource management committee and disseminating management measures.

- Development of FAD as a tool for fund generation, fishing effort diversification, and organizational strengthening for fishermen associations and community resource management committees
- Workshop on a modified canoe and a field test of the modified canoe for the fishers in Mangaliliu and Lelepa
- Ocean nursery trial of the giant clam in the two communities in Moso Island, Sunae and Tasiriki
- Introduction of a fishing activity record sheet to grasp the issues regarding data collection and to build a data collection system

### Issues and countermeasures

Through the implementation of the Project so far, the Project members have come to understand that it is not within the capacity of the community and their resource management committees to conduct multiple activities at the same time, given the limited time frame. Currently, the Project is trying to introduce FAD and a data collection sheet, and formulate a CBCRM plan. The participants of the workshop want to take time to address each topic and take action. Therefore, it is important to select the number and content of activities to match the initiative and capability of the community people.

## 3. Others

### 3.1 Field visit by the JICA Fiji officer

Mr. Tamura (JICA Fiji officer) and Mr. Udagawa (Japanese expert assigned to the University of South Pacific: USP) visited the Project during on December 11–16, 2012, and participated in the workshop on FAD in Aneityum island.

### 3.2 Collaboration with related organizations

SPC is to send an expert on green snail seed production and surveys for the natural green snail stock in May 2013. In order to build a collaborative relationship with other departments of the Vanuatu

Government, a representative of the Department of Cooperative and Ni-Vanuatu Business was invited to visit Aneityum and Mystery Island in March together with the Project members.

### 3.3 Publication of the Project

- The Project designed a T-shirt with the logo of the Project and the VFD in November 2012.
- The Vanuatu TV station and newspaper (Daily Post) covered the activities of the Project in January 2013.
- The Project provided a brochure explaining the giant clam (*Tridacna gigas*) transplanted from Tonga to Vanuatu (North Efate) for tourists in February 2013.
- The Project made a calendar introducing the activities photo in February 2013.

## 4. Activities Planned for March 2013 to July 2013

### 4.1 Improve the capacity of the VFD in managing seed production and ranching of marine shellfish

#### (1) Formulation of the draft hatchery management plan

The Project will make a final review and update in December 2013, including the activity plan for 2014. Moreover, the Project will try to make periodic reviews and updates to the plan at the end of every year.

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#### Pump, water inlet, and water tanks

In addition to the daily maintenance, the Project will try as much as possible to improve the facility.

#### (2) Support the production and release of the shellfish seeds

##### Production of seeds

TS13 will be available as seeds for the giant clam (*Tridacna squamosa*) in May 2013. After that, the Project will evaluate the technical level of its VFD counterparts. As TS13 is expected to produce enough seeds, the Project plans no further spawning trial in the next season (from September 2013 until March 2014).

The Project plans to carry out a spawning trial for the green snail in May 2013. The Project will procure the broodstocks of the green snail after checking the stock condition. The next spawning trial will be done not only by the VFD counterparts, but under the instruction of the Project member and the expert to be dispatched by SPC. If the trial fails, another trial will be done in September or October 2013.

##### Release of the shellfish seeds



The Project plans no additional release of shellfish seeds as there is not enough time for the seed to grow to a suitable size for release during the Project. The Project will consider the best way to observe the growth of trochus less than 2 cm in the hatchery. The 34 broodstock of green snail kept at the VFD hatchery will be released into the natural environment after the spawning trial. The Project will decide the release site based on the stock assessment survey to be done by SPC.

(3) Monitoring the impact of released broodstock

The Project, in collaboration with SPC, plans to conduct the baseline survey in May 2013 to survey the dispersion of the released green snail in North Efate and the current condition of the group of green snail broodstock in Moso Island. In addition, the Project plans to carry out a detailed survey in August 2013 on the trochus and green snail released in Uripiv Island and conduct a mid-term evaluation on the impact of released shellfish.

(4) Monitoring the released seeds and broodstock

The Project will consider the monitoring method for the green snail in North Efate based on the survey results of SPC and IRD. The Project will consider the monitoring method for the green snail and trochus in Uripiv Island based on the result of the detailed survey planned for August 2013.

(5) Development of standard marine shellfish stock enhancement method by community

The Project will continue the stock enhancement trial using the broodstocks for green snail and trochus to consider comprehensive resource management method by communities. The Project will start the ocean nursery trial for the giant clam *Tridacna squamosa* in May 2013. The Project will decide the feasibility of *Tridacna gigas* in 2014.

(6) Development of the marine shellfish marketing plan by community

The Project will provide giant clams (*Tridacna squamosa*, TS12) more than one inch in size to motivated people in the community in May 2013. The harvest and marketing of the shell is planned for November 2013. The Project believes that export regulations for the giant clams should be modified for the development of marketing. Currently, the VFD directly monitors and authorizes the export of giant clams. For more efficient procedures, some degree of authority should be delegated to the private sector. The community's marine shellfish marketing plan will be developed based on the result of this trial and the experience gained in Phase 1 of the Project.

#### 4.2 Improve the VFD's capability to implement a baseline survey and analyze results

(1) Examine and update the survey method and database format

The Project will update the data record sheet for the fishing activity if necessary. In addition, the

Project will introduce the database format and consider the issues and countermeasures so that the resource management committee can utilize it without problems.

4.3 Improve the capacity of the VFD to provide coastal fishing community with technical assistance for CBCRM

(1) Hold a training program on proper approaches to CBCRM

(2) Hold a training program on supporting CBCRM

The Project will consider the effective training program through the implementation of the pilot project explained in 4.4.

4.4 Implement the trials for the CBCRM plan with the VFD

(1) Activities common in the target sites

The Project will continue to work to develop FAD fishery management as a tool to diversify fishing efforts and strengthen the organizations of fishermen, as well as establish the data collection system

(2) Activities in each site

i) Aneityum (synergy of the development of tourism and resource management)

Development of seafood products for tourists

Community people in Aneityum offer almost exclusively lobster to the tourists visiting Mystery Island by cruise ship. If they can develop other seafood options, the fishing pressure on lobster will be reduced. The Project believes that introducing FAD could increase the supply of large pelagic fish such as yellow fin tuna and wahoo. Based on this idea, the Project will build capacity among the community people as regards fishing techniques, cooking, hygiene issues, hospitality, and simple bookkeeping in collaboration with related organizations.

To reduce the fishing pressure on the marine shellfish in the reef by women and children, the Project plans to introduce a shell polishing technique. In collaboration with Mangaliliu, the shell polishing products made in Mangaliliu can also be marketed in Aneityum.

It is important to strengthen the resource management activities through the creation of funds through these activities and coordination with other related organizations.

ii) Malakula (Fund generation for the resource management committee)

Strengthening resource management activity and fund creation

The Project plans to deploy additional FADs and develop the Crab Bay as a yacht harboring place to generate funds. Also, the Project strives to establish a data collection system with a data record sheet in collaboration with a JICA volunteer. If large pelagic fish catches increase with the introduction of FAD, the Project may conduct a trial of fish marketing in Port Vila.

iii) Efate

Formulation of resource management plan and the activation of resource management committees  
Mangaliliu and Lelepa

The Project plans to diversify fishing efforts through the FAD and modified canoe. In collaboration with the game fishing agent, the Project may promote the utilization of FAD for tourists as a means of generating funds. As another means of fund generation, the Project will try to expand the market for shell polishing products made in Mangaliliu.

Moso (Sunae and Tasiriki)

The Project plans to combine the utilization of the giant clams (*Tridacna gigas*) for tourism development and awareness raising on the issue of resource management. A detailed activity plan will be decided in consultation with community people.

4.5 Monitoring and evaluation of the implementation of the CBCRM plan with the VFD

The Project will consider the indicators for the Project Design Matrix (PDM) based on the CBCRM evaluation sheet and the results of the baseline survey.