

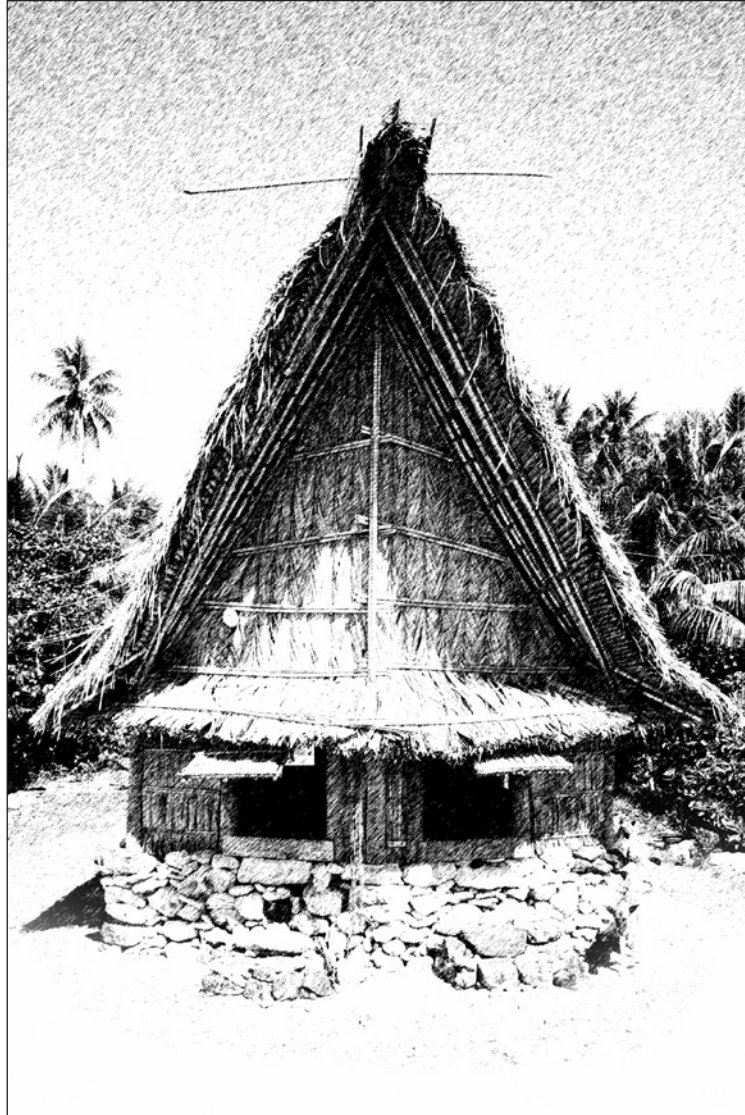


## Community fisheries management plans for CCCPIR project sites in Yap, FSM





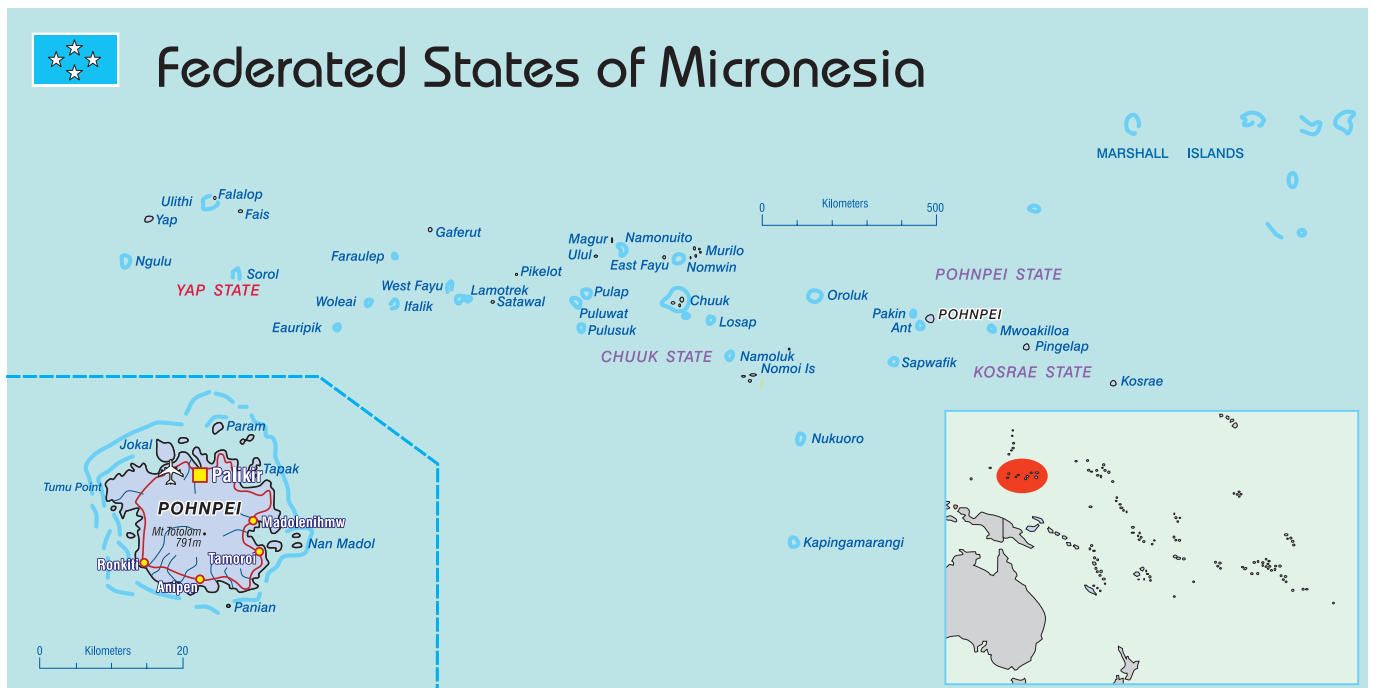
# Community fisheries management plans for CCCPIR project sites in Yap, FSM



Caption: ???????



# 1. Introduction



Yap State, one of four states making up the Federated States of Micronesia (FSM), consists of a cluster of high islands and 134 scattered low atolls and islets, 22 of which are inhabited. It is situated in the western Caroline Islands between latitudes 7° and 10° N and longitudes 137° and 148° E. The low coralline islands and atolls are referred to as the outer or neighboring islands, or Remathau. Mainland Yap includes four high islands, Yap, Tamil-Gagil, Maap and Rumung, within an extensive fringing reef system that is 31 km long and up to 12 km wide. There are eight deep channels through the outer fringing reef and three of these lead to a deep embayment (Orcott et al. 1989). Mangroves make up about 12% of the vegetation, and there are widespread seagrass meadows with at least seven species of seagrass (Falanruw et al. 1987). There are 99 species of algae reported as well as 169 species of hard corals, 426 species of fish and four species of sea turtles (Tsuda 1978; Falanruw et al. 1975). According to the 2000 census, the total population of the state was 11,241, with a population growth rate of about 2% per year.

The regional Coping with Climate Change in the Pacific Island Region (CCCPir) program is funded by the German government and implemented by the Secretariat of the Pacific Community (SPC) and the German cooperation agency Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

The Pacific Islands region is among the world's most vulnerable regions in the face of climate change impacts, and there is an urgent need to advance adaptation and mitigation measures in the region. Climate change impacts such as changing rainfall patterns, more extreme floods and drought, seasonal changes, increased cyclone intensity, ocean acidification and rising sea level are likely to affect all communities in the Pacific Islands.

The CCCPIR program supports the Pacific Island countries and territories (PICTs) to increase their resilience against the impacts of climate change and to reduce their greenhouse gas emissions, the latter with focus on energy and forestry. The program also collaborates with the Secretariat of the Pacific Regional Environment Programme (SPREP) and the University of the South Pacific (USP). The program is addressing climate change in five important development sectors: land use (agriculture, forestry and land use planning), fisheries, education, energy and tourism.

The coastal fisheries management activities in Yap are jointly implemented by GIZ and SPC's Fisheries, Aquaculture and Marine Ecosystems (FAME) Division.

## 2. Coastal fisheries resources and uses

Coastal fishing activities in Yap are guided to some extent by a complex system of traditional rights, restrictions and controls (Falanruw 1994). However, the strength of these systems has been substantially weakened over the past two decades by changes in Yap's social, religious, economic and political systems (Graham 1991). Recent changes include the introduction of motorized boats, flashlight spearing and gillnets – all techniques that do not conform with traditional regulations. Thus, fishing at night and with flashlights, and outside the area in which fishing is traditionally allowed, is now common. Estimates made in 1987 suggested that night and day spearing combined accounted for 57% of the reef fish catch (with 44% speared at night), while surround nets and gillnets accounted for only 17% (MRMD 1987). The rest was caught by fish traps, throw nets, scoop nets and hook and line. The increased importance of salaries has lessened the time available to employ traditional fishing techniques, which are more time-consuming. It has also increased market demand for reef fish and other seafood. However, not all individuals within the society cooperate in controlling fishing activity at the community's reef.

Any activity involving commercial exploitation of Yap's reef and lagoon requires the consent of the traditional leaders and custodians of that resource. Today, it is hard to distinguish between traditional and commercial fishing, with most fishers selling some or all of their harvest to local retail outlets. Some fish are also sent off-island for relatives abroad and income. Traditional controls are still maintained, but these relate mainly to whether or not fishing should occur rather than to how it is performed. There is increasing concern being expressed that the sale of reef fish in local stores and restaurants is contributing to overfishing and depletion of fish stocks.

By tradition, two basic characteristics of Yapese customary tenure systems helped avoid over-exploitation:

- a. Ownership of reef areas and fishing privileges by small groups, such as villages, tabinaw (estate, or household and associated resources), and village associations; and
- b. Ownership of marine resources that is not purely private but subject to hierarchical systems of control.

This system of quasi-private ownership and associated fishing rights included regulations on fishing in geographical areas or habitats, the use of certain types of gear and methods, and target species. Attached to the regulations were explicit 'rules of conduct and obligations for distribution of catch' (Falanruw 1991). The system sometimes also involved reef closure practices to restrict effort. Falanruw (1991) describes the existence of 'an ethic of not taking more than one's share, or of not harvesting all out of deference to social and spiritual sanctions.'



### 3. Climate change impacts and projections

Yap, like any other small island in the Pacific, is vulnerable to the impacts of climate change. Recent studies conducted by SPC (Bell 2012) highlighted impacts of climate change that are expected to add to the already existing local threats to mangroves, coral reefs, seagrasses and intertidal flats, resulting in declines in the quality and area of all habitats. Projections show progressive decline in productivity of all components of coastal fisheries due to habitat loss and reduced recruitment, habitat degradation, and ocean acidification. As a result of these projected changes in the coastal environment, additional loss of traditional knowledge and heritage can be expected through the loss of culturally-based practices within the coastal environment.



These projected changes, coupled with continued pressure to export fish, pose a threat to Yap's coastal fisheries, and therefore to the availability of coastal fisheries resources that support the island communities' livelihoods and food security. The study further recommended the following adaptation measures and activities in an effort to build communities' resilience and their ability to adapt in a changing environment.

- Manage coastal fish habitats and fish stocks to maintain a good supply of fish for food security;
- Increase the number of livelihoods that can be sustained by fishing, tourism and aquaculture;
- Foster the care of coastal fisheries habitats;
- Sustain production of coastal fish and invertebrates;
- Increase access to tuna for urban and rural populations;
- Increase diversity of coastal demersal fish;
- Fully implement sustainable fishing effort schemes;
- Develop environmentally friendly fishing operations.

Insufficient understanding, knowledge and professional expertise limit the implementation of adaptation measures. Public awareness programs on climate change impacts and adaptive responses are required, as are broad-scale public consultations and participation in planning and implementation. A priority is to improve the understanding and use of relevant science and traditional knowledge in developing adaptation measures that are appropriate for coastal fisheries of Yap and will be taken up by local communities.

This plan aims to provide adaptation activities for the selected communities. It is envisaged that with successful implementation of such measures and lessons learnt, this program will set examples that would benefit other communities in the future.

The plan also takes into account and complements climate change-related efforts and materials by other organisations, such as the Micronesia Conservation Trust (in particular the organization's Climate Change Toolkit), International Organization for Migration (IOM), Climate Adaptation Disaster Risk Reduction Education (CADRE) and other related programs.

## 4. Scope of the plan

This management plan outlines the objectives for the sustainable management of coastal fisheries resources and the strategies to be employed to achieve them. It also provides key adaptation activities to support communities in a changing environment and to assist building their resilience to the impact of climate change. The management actions, strategies and adaptation measures apply to the communities of Riken & Wanyan, West Fanif and Rumung as specifically provided for in this plan.

Sustainable management of coastal fisheries resources is the responsibility of the Marine Resources and Management Division (MRMD) of the Department of Resources and Development. Partners such as YapCAP (Yap Community Action Program) are also working – mostly at the community level – towards achieving state objectives of sustainable management.

The goal of sustainably managing coastal fisheries resources is backed by Title 18 of the Yap State Code, the purpose of which is to promote and support economic development and to manage and conserve living sea resources within the jurisdiction of the State of Yap pursuant to the Constitution of the Federated States of Micronesia. Drafting of legislation supporting community management actions is undertaken in consultation with respective communities.

This management plan will operate for a three-year period subject to annual reviews and amendments as considered necessary by MRMD, YapCAP and the communities.

## 5. The project team

The project team includes representatives of MRMD and YapCAP, community leaders, and representatives from the community. It also includes national partners and development partners such as the CCCPIR program and FSM Department of Resources and Development. The team's functions include the following:

- Advise on issues arising from the communities;
- Identify funds and resources for implementing activities;
- Facilitate vulnerability and adaptation assessment for selected communities;
- Coordinate tasks with relevant agencies/organisations for action;
- Provide advice to state legislature regarding coastal resources and related ecosystems;
- Advise local chiefs and governments;
- Develop, harmonize and conduct community awareness and outreach programs;
- Work in partnership with development partners;
- Monitor, review and evaluate activities;
- Undertake timely review of the community management plan.



## 6. Project sites

Three sites were selected for this project: Riken & Wanyan, West Fanif and Rumung. The sites were selected by the state authorities based on existing community efforts in terms of resource management and conservation, vulnerability to climate change and willingness to participate in resource management programs.

### 6.1 Riken & Wanyan

*About the site*



Riken & Wanyan, located in Gagil Municipality are situated on the east coast of Yap Island at 9° 33' N latitude and 133° 12' E longitude. Riken was chosen as a potential site for the community-based ecosystem approach to fisheries management because of its past initiative in establishing a marine protected area (MPA) and its involvement in previous consultations and surveys pertinent to ecosystem management.

International Waters Project activities were also undertaken in Riken & Wanyan promoting the following key messages:

- Use of MPAs as one effective means to repopulate fisheries resources;
- The long-term benefits of recruitment and spillover effects resulting from well managed and protected MPAs;
- Institutional framework for the cost effective management and sustainable maintenance of the MPAs.

The community is fully aware of the decline in the catches of fish and shellfish in its fishing areas over the past few years, and members are concerned that it will continue. The community is fully committed to managing its fisheries resources and implementing adaptation activities that support its members.

#### *Policy goals and community values*

The policy goals and community values of Riken & Wanyan aim to promote sustainable coastal fisheries resources. This is achieved through establishing marine protected areas and introducing alternate fishing methods. The community values and goals are maintained through assistance and collaboration amongst traditional resource owners, government, non-governmental organisations, relevant stakeholders and technical organisations.

The ulung, a traditional fish shelter on reef areas, is considered an environmentally friendly traditional fishing method. The ulung functions as an aggregating device attracting fish to certain areas to facilitate subsistence fishing. The Riken & Wanyan community values the use of the ulung as an activity that supports its management approach.

#### *Possible threats in achieving policy objectives and community values*

Threats to achieving the community's policy goals include lack of community motivation, poaching by other communities in the Riken & Wanyan fishing grounds and absence of or limits on funding and technical assistance supporting community fisheries management initiatives. Other threats to marine habitats come from overfishing, water pollution, dredging, erosion or runoff from landbased activities, destructive harvesting, introduction of invasive species and incompatible commercial development.

## Developing the Riken & Wanyan plan

### *Objectives*

To ensure sustainability and productivity of the marine and fisheries resources, the community agrees on the following objectives:

- Strengthen community leadership of fisheries management and help sustain associated ecosystems through effective community participation;
- Recognise traditional cultural values in managing coastal fisheries resources and recognise their contributions to food security and community wellbeing;
- Generate opportunities for communities through participation of development partners;
- Ensure sustainable utilization of coastal fisheries resources now and for future generations;
- Strengthen the enforcement of existing MPAs.

### *Community vision*

‘A community that is self-sufficient through proper management of its natural resources and use of alternative sources for present and future generations.’

### *Community consultations*

The first community consultation in Riken & Wanyan was conducted on 23 July 2012 at the Community Meeting House at Wanyan. The meeting was attended by members of both villages and facilitated by staff from MRMD, SPC, FSM Department of Resources and Development (FSMR&D), YapCAP and GIZ. A list of participants is appended.

At the consultations, members of the community highlighted five key issues facing Riken & Wanyan:

- Decline of fish catches;
- Unhealthy coral reefs;
- Loss of mangrove;
- Poaching within existing MPAs;
- Blue holes (deeper areas of the lagoons known to be full of fish) getting smaller and shallower.

To address these problems, the following management actions were recommended.

### *Decline in fish catches*

Results of research conducted by SPC, MRMD and YapCAP confirm the view of the local community regarding the decline in catches and fish within the area. Fishers are reporting spending more time fishing as well as shrinking catches with smaller sized fish being caught. The changes were confirmed by some of the older members of the community during the consultation.

One of the main causes of decline in fish catches identified by the community was overfishing. To control overfishing, the community felt that the following actions should be undertaken.

### *(a) Enforcement of existing MPA/Marine Conservation Area (MCA) policies and regulations*

Effective enforcement will also address the issue of poaching within these areas, which is another of the key issues highlighted by the community.

#### *Management actions*

- Traditional leaders should play a leading role and spearhead MPA enforcement;
- The wider community should respect MPA rules;
- MRMD and YapCAP should carry out monitoring programs for the MPA area.

#### *The community should:*

- Strengthen implementation and enforcement of the MCA policies and regulations; and
- Promote wider awareness on the MCA project.

The project team should assist the community in documenting the site policies and regulations, including fines and penalty fees.

### *(b) Control modern fishing gear and techniques*

During the consultation, community members mentioned that the influx of modern fishing gear and techniques in the area contribute to overfishing. This includes the use of gill nets with undersized mesh as well as the use of flashlights for night fishing. The use of these types of gear and technology has increased the effectiveness of fishing so that fishers can indiscriminately harvest fish of any species or size, driving the populations into decline.

Therefore, the community recommended the following management actions.

#### *Management actions*

- Community leaders should control the use of certain types of fishing gear and technology in Riken & Wanyan fishery waters;
- Community leaders and fishers should promote smaller traditional fishing traps and other environmentally friendly traditional methods;
- MRMD and YapCAP should work with relevant authorities to control importation and sale of nets with meshes below allowable sizes;
- MRMD, with assistance from local fishers, should establish a program for catch monitoring and stock assessment within the area.

### *(c) Develop nearshore fishing alternatives*

Due to the easy accessibility of reefs, mangrove areas and lagoons, coastal fisheries resources are vulnerable to overfishing. As the population increases, the amount of fishing pressure in the area increases each day. It is therefore recommended that MRMD and YapCAP, with assistance from the national government and development partners, identify ways to lessen pressure on coastal fisheries resources. One approach that has proven successful in other parts of the region, including in Micronesia, is the deployment of nearshore fish aggregating devices (FADs).

#### *Management actions*

- MRMD and YapCAP should solicit financial assistance from external development partners in identifying alternatives that would lessen pressures on coastal fisheries resources, such as nearshore FADs;
- MRMD and YapCAP should work with relevant organisations in determining the best sites for the deployment of FADs;
- MRMD and the community should work with relevant organisations in conducting training on FAD development, utilization and maintenance.

### *Unhealthy coral reefs*

Based on their observations, community members stated during the consultation that the health of the coral reefs within and around the project site is not good, and that this could be the result of:

- Runoff and erosion on nearby land;
- Coral bleaching; and
- Natural disasters.

Due to lack of data to validate this and draw some conclusions and recommendations, it was determined that the following management actions should be temporarily implemented in the hope of addressing the issues until necessary surveys can be conducted and adequate recommendations provided.

### *(a) Control runoff and erosion on nearby land*

#### *Management actions*

The community should begin employing measures to mitigate runoff and erosion, including:

- Refraining from pursuing environmentally unsustainable development projects; and
- Employing environmentally friendly land management and farming practices.

#### *The project team should:*

- Work with line offices and agencies in conducting community awareness and outreach programs to enhance community awareness on environmentally friendly land management and farming practices as well as environmentally sustainable development projects;
- Conduct awareness and outreach programs with relevant offices and agencies to promote community awareness on state policies and regulations relating to streams and coastal buffer zones.

### *(b) Conduct studies on coral bleaching*

The community also feels that coral bleaching could be playing a role in the unhealthy coral reefs.

#### *Management actions*

The project team should work with relevant agencies, including external development partners, upon availability of funds, to conduct studies that would determine:

- If coral bleaching is occurring in the area;
- The extent of any coral bleaching found; and
- If coral bleaching is contributing to poor health among local coral reefs.

### *(c) Monitor effects of natural disasters*

The community feels that natural disasters contribute to the unhealthy condition of coral reefs. This may be true; however, there is not enough data presently available to conclude so.

#### *Management actions*

Through relevant agencies and partners, the project team should extend the 'coral reef monitoring program' to include the effects of natural disasters, with the objective of determining the extent of damage.

### *Loss of mangrove*

Community members also shared their concerns on the loss of mangroves, which may also be contributing to the decline of fish stocks within the area.



#### *Management actions*

Because there has not been any survey on the health of the mangroves in the area, the project team should:

- Conduct a preliminary assessment on mangroves in the area to determine if they are being lost; and
- If needed, solicit assistance from external development partners to conduct a thorough assessment and determine the cause(s) of the loss of mangroves.

#### *Blue holes getting smaller and shallower*

Based on observations, community members raised concerns about blue holes getting smaller and shallower for unknown reasons.

#### *Management actions*

Government offices and agencies do not have adequate data to determine if blue holes are getting smaller and shallower, and the extent of any changes. Therefore, upon availability of funding, the team will:

- Work with relevant agencies including external development partners in determining the cause and extent of changes, if any; and
- Share the findings with the community, along with possible solutions to address the issue.

## 6.2 West Fanif



The first consultation with the West Fanif community was conducted on the 24 July 2012 at the Men's House in Gilfith village. The meeting was attended by key individuals from villages that are members of the West Fanif MCA project, and facilitated by staff from MRMD, SPC, FSMR&D, YapCAP and GIZ.

#### *Objectives*

The objectives of the West Fanif community are:

- Strengthen community leadership of fisheries management, and help sustain the associated ecosystem through effective community participation;
- Recognise traditional cultural values in managing coastal fisheries resources, and the contributions of these fisheries to food security and community wellbeing;
- Generate opportunities for communities through participation of development partners;
- Ensure sustainable utilization of coastal fisheries resources now, and for future generations.

### *Community vision*

'A community that is self-sufficient through proper management of its natural resources and use of alternative sources for present and future generations.'

### *Management*

At the consultations, members of the community highlighted a key issue they face relating to their MCA project: the decline in catches of fish and harvests of shellfish.

To address the issue, the following management actions were recommended.

### *Decline in fish catches*

Research conducted by SPC, MRMD and YapCAP has confirmed the view of community relating to the decline in fish catches and shellfish harvests. Fishers are reporting spending more time fishing today compared to several years ago to catch the same quantity of fish. Also, they noted that the fish they catch are getting smaller and smaller in size.

According to the community, one of the main causes of this issue is overfishing. To mitigate the problem, the community felt that the following actions should be taken.

### *(a) Consistent enforcement of existing MPA/MCA policies and regulations*

*The community agreed to:*

- Enhance implementation and enforcement of the MCA policies and regulations, including imposing fines and penalty fees when needed;
- Promote wider awareness of MCA policies and regulations amongst community members, including, if needed, by radio; and
- Document MPA policies and regulations, including fines and penalty fees, to facilitate consistent implementation and enforcement.
- Management actions
- Traditional leaders should play a leading role in MPA enforcement;
- Traditional leaders should play a leading role in establishing a program to promote wider awareness for the MCA;
- MRMD and YapCAP should continue their monitoring program and when feasible furnish relevant findings to the community to promote better understanding of project status.

The project team should assist the community in documenting the policies and regulations, including fines and penalty fees.

### *(b) Control modern fishing gear*

During the meeting, community members stated that the influx of modern fishing gear in the area contributes to overfishing. This includes gill nets with unregulated mesh sizes, and the use of flashlights for nighttime spearfishing. The use of this gear has increased the effectiveness of fishing, allowing fishers to indiscriminately harvest fish of any species and size and driving populations into decline. The community recommended the following management actions.

### *Management actions*

- MRDM, with the assistance of line offices and agencies, should spearhead initiatives that could regulate importation, sales and use of gill nets with mesh sizes deemed to contribute to the decline in fish stocks;
- Traditional leaders and the community in general should promote the use of traditional fishing methods, including fish traps;
- MRMD and local fishers should establish a program for catch monitoring and stock assessment within the area.

### *(c) Control the high demand for fresh fish*

Community members shared their belief that high demand for fresh reef fish plays a role in overfishing. This belief is confirmed through a survey conducted by YapCAP on reef fish sold at primary fish markets over a three month period.

#### *Management actions*

- Traditional leaders should spearhead efforts to impose prohibition on sales of reef fish caught in the area;
- Government offices and line agencies should initiate efforts to enact legislation regulating the size of fish bought by fish market owners from fishers to sell at their markets;

### *(d) Develop nearshore fishing alternatives*

Due to the easy accessibility of mangroves, lagoons, and reefs, coastal fisheries resources are vulnerable to overfishing. As the population increases, the amount of fishing pressure in the area increases each day. It is therefore recommended that MRMD and YapCAP, with assistance from the national government and development partners, identify ways to lessen pressure on coastal fisheries resources. One approach that has proven successful in other parts of the region, including in Micronesia, is the deployment of nearshore FADs.

#### *Management actions*

- MRMD and YapCAP should solicit financial assistance from external development partners in identifying alternatives that would lessen pressures on coastal fisheries resources, such as nearshore FADs;
- MRMD and YapCAP should work with relevant organisations in determining the best sites for the deployment of the FADs;
- MRMD and the community should work with relevant organisations in conducting training on FADs development, utilization, and maintenance.

## 6.3 Rumung



Rumung, the northernmost municipality of Yap, is commonly referred to as ‘The Forbidden Island’. It is situated on the north coast of Yap Island at 9° 37’ 19” N, 138° 09’ 14” E and is only accessible by boat, though it is within the reef. The community is fully committed to managing its fisheries resources and implementing adaptation activities that support its members.

Rumung was chosen as a potential site for the community-based ecosystem approach to fisheries management because of its 2004 initiative establishing an MPA, the obvious community interest in and commitment to enforcing and watching over the MPA, and the fact that the community maintained this interest and commitment, as shown by subsequent surveys. These factors show the community’s interest in carefully managing their ecosystem.

The Rumung community was also selected as one of the sites for the International Waters Project (IWP) in Yap. The project promoted the following key messages:

- Use of MPAs is an effective means to repopulate fisheries resources;
- Well managed and protected MPAs result in longterm benefits through increased recruitment and other spillover effects;
- A good institutional framework is needed for cost effective management and sustainable maintenance of the MPAs.

Rumung was one of four communities that participated in the classroom and field session during the initial ecological baseline survey for IWP host communities. In addition to the ecological baseline survey of the nearshore reef fisheries at proposed MPA sites in the four IWP communities, the project involved preparing a monitoring plan and providing support for the involvement of the community in baseline assessment and monitoring work. Rumung was the only site surveyed with significant sea grass areas, with 22% of the site being covered by sea grass. Coral cover was 27%, the second highest percentage of all the areas surveyed.

### *Management*

The Rumung representative requested assistance from the project with landbased activities. A preliminary scoping mission by the project team highlighted the following issues for consideration.



### *Taro patches*

The community has reported some problems relating to growing taro, especially due to saltwater intrusion, which reports from farmers indicate has stunted growth in most of the farmed taro species. Traditional farming practices such as the use of gravity to cause water to flow from one patch to another are common on the island. The community requested more saltwater tolerant species for farmers and advice and training on improved farming techniques.

### *Coastal erosion*

Evidence of soil erosion was observed on the island. Beach land has been washed into the water, especially in areas with less vegetation. The community requested that a sea wall be built to withstand the impacts of storm surges and spring tides, as well as sea level rise. One recommendation is to facilitate a program to plant trees in the affected areas, especially species well suited to coastal areas, such as mangroves.

### *Marine Protected Areas*

The Rumung Island community in 2004 declared an MPA. However, this decision needs to be well enforced, and there is a need for resources to strengthen monitoring and surveillance. Permanent markers for MPA boundaries and relevant regulations should be in place for the MPA to be effective.

### *Spawning seasons*

Community members raised some issues relating to identifying spawning seasons and areas around the island. Traditional knowledge on spawning grounds, season and time is highly treasured by the island community. However, there is little information about areas where fish species used to spawn. The island people want to know why such known spawning activities are declining around the island. The community requested a scientific study on spawning seasons, time and activities around the island integrating traditional knowledge on various species.



## Appendix 1. Record of consultations with Riken & Wanyan community

Issues	Causes	Management actions/solutions	Entity responsible	Time frame
Decline of fish catches/ overfishing	Inadequate enforcement of MPC policies and regulations	Enhance/strengthen enforcement of MCA policies and regulations	Traditional leaders (lead) and Community	
	Increase in influx of modern fishing gear	Control fishing gear types used in Riken & Wanyan fishery waters	Traditional leaders (lead) and Community	
		Promote smaller traditional fishing traps and other environmentally friendly traditional methods	Traditional leaders (lead) and Community	
		MRMD and YapCAP to work with relevant authorities in controlling importation and sales of nets with meshes below allowable sizes	MRMD (lead) and Line agencies	
		Establish program for catch monitoring and stock assessment within the area	YapCAP (lead) and Line offices and partners	
		Development/deployment of FADs	MRMD & SPC (lead) and Line agencies	
Unhealthy coral reefs	Runoff and erosion on nearby land	Refrain from pursuing environmentally unsustainable development projects	Traditional leaders (lead) and Community	
		Employ environmentally friendly land management and farming practices	Traditional leaders (lead) and Community	
		Conduct awareness programs to enhance community awareness on environmentally friendly land management and farming practices as well as environmentally sustainable development projects	YapCAP (lead) and Line offices/partners	
		Conduct awareness and outreach programs to promote community awareness on state policies and regulations relating to streams and coastal buffer zones	YapCAP & EPA (lead) and Line agencies/offices/partners	
	Coral bleaching	Solicit outside assistance to conduct survey on coral bleaching	MRMD (lead) and Line offices/agencies/partners	
	Natural disasters	Extend 'coral reef monitoring program' to include the effects of natural disasters	YapCAP (lead) and Line agencies/offices/partners	
		Acquire, distribute and facilitate awareness and outreach programs on disaster preparedness and risk management plans		
Loss of mangrove	Unknown	Solicit external assistance to conduct necessary surveys to determine cause(s) and extent, if any	MRMD (lead) and Line agencies/offices/partners	
Blue holes are getting smaller and shallower	Unknown	Solicit external assistance to conduct necessary surveys to determine cause(s) and extent, if any	MRMD (lead) and Line agencies/offices/partners	

## Appendix 2. Record of consultations with West Fanif community

Issues	Causes	Management actions/solutions	Entity responsible	Time frame
Decline in fish catches	Inadequate enforcement of MPA policies and regulations	Promote wider awareness on MPA amongst community members	Traditional leaders and Community	
		Promote wider awareness of MCA policies and regulations amongst community members, including if needed, by radio	Traditional leaders and Community	
		Document MPA policies and regulations, including fines and penalty fees, to facilitate consistent implementation and enforcement	YapCAP (lead) and Line agencies and Community	
	Increased influx of modern fishing gear	Initiate measures that could regulate or enforce existing laws on importation and sales of undersized gill nets	MRMD (lead) and Line agencies	
		Promote the use of traditional fishing methods, including fish traps	Traditional leaders (lead) and Community	
		Establish program for catch monitoring and stock assessment within the area		
	High demand for fresh reef fish	Traditional mechanisms that would ban sales of reef fish caught in the area should be implemented	Traditional leaders and Community	
		Initiate efforts to enact legislation regulating the size of fish bought by fish market owners from fishers to sell at their markets	Government offices and Line agencies	

## Appendix 3. List of people consulted

List of participants for CCCPIR workshop on community approach to fisheries management and climate change adaptation initiatives

	Names	Organization/agency/community	Contact information
1	James Yinug	Marine Resources Management Division/R&D	jayinug@yahoo.com
2	John Gamou	Riken MPA	350-6675
3	Ivan Kadaneged	International Office of Mitigation (I.O.M)	350-8510
4	Ignatius Moolang	Riy MPA (Rumung)	950-9947/350-3990
5	Mike Hasurmai	Marine Resources Management Division	mrmdyap@mail.fm
6	Ryan Talken	Div. of Agriculture & Forestry	rtalken@gmail.com
7	Mailing Damasus	Marine Resources Management Division	350-2350
8	Francis Ruegrong	Div. of Agriculture & Forestry	350-2183
9	Fenno Brunken	SPC/GIZ CCCPIR	923-9768
10	Tina Fillmed	Yap Environmental Protection Agency	epayap@mail.fm
11	Margie Falanruw	U.S. Forest Service	mfalnruw@mail.fm
12	John Mangefel	Fanif MCA	jamgprez@yahoo.com
13	Joe Fanafal	Environmental Protection Agency	epayap@mail.fm

	Names	Organization/agency/community
1	Frank Haregaichig	Department of Resources & Development - Director
2	John Sohlith	Department of Resources & Development - Deputy Director
3	Francis Ruegrong	Div. of Agriculture & Forestry - Waab Wildlife Coordinator
4	Sebastian Anefal	Yap State Governors Office - Governor
5	Javez Mooteb	Yap Community Action Program
6	Kate Mulalap	Yap Community Action Program
7	Moses L. Fathal	Yap Community Action Program yapcap@mail.fm
8	Margie Falanruw	U.S. Forest Service
9	Steven Young-uhk	C.O.M. Land Grant syoung@comfsm.fm
10	Stan Fal'mngar	C.O.M. Land Grant stanfal@comfsm.fm
11	Berna Gorong	MCT Representative bgorong@yahoo.com

### Waanyan & Riken community consultation

	Names	Community/village
1	Victor Pluw	Wanyan
2	Norbert Yifthege	Wanyan
3	Achilles Defngin	Wanyan
4	Machieng Jonathan	Wanyan
5	Ignatius Ken	Wanyan
6	John Tamngig	Wanyan
7	Gabriel Falalay	Wanyan/Riken
8	David Chieg	Wanyan
9	Cyprian Mugunbey	Wanyan/Riken

### West Fanif MCA community consultation

	Names	Community/village
1	John Fithngan	Yyin Fanif
2	Waath Kenmed	Yyin Fanif
3	James Yatman	Gilfith Fanif
4	Moses Fathal	YAPCAP
5	Gilbert Chieg	Yyin Fanif
6	Folownug Kenmed	Gilfith Fanif
7	Martin Muun	Gilfith Fanif

### Rumung

Name	Community/village
Ignatius Moolang	Rumung MPA Representative







