

Cross-Node Cultural Roles Synthesis
MMAS Cultural Roles Team

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i) Executive Summary (1-2 and 5-10 page forms)

I) Introduction

A) Development and Purpose of Cross-Node Synthesis

The purpose of this document is to synthesize and compare across the four nodes of the MMAS project (Belize, Brazil, Fiji and Panama) the cultural characteristics of the human communities and their involvement with coastal and marine resources and environments, and the social and cultural impacts and outcomes stemming from the establishment of Marine Managed Areas (MMAs) in the respective locations. Individual cultural roles research projects were carried out in each node, led by an in-country Principal Investigator (Belize, Dr. Joseph Palacio; Brazil, Dr. Isabela Curado; Fiji, Dr. Joeli Veitayaki; Panama, Dr. Dolores Cordero), with Dr. Mike Orbach of Duke university acting as Cross-site Coordinator. Individual node reports are available on the MMAS website.

B) Flow of Report

The report will begin with a brief history of coastal and marine management for each node, with an emphasis on the development of MMAs. It will then present brief descriptions of the Community Structure and Organization and Cultural Context; History of Fishing; and History of Fisheries Management for each node. It will then proceed to a description of selected MMAs established in each node, the social and cultural changes that accompanied the establishment of each MMA, and other factors unrelated to MMAs that affected the human communities. Finally, we will comment on the Fate of

Traditional Populations, Communities, Cultures and Cultural Activities in the four nodes, compare the social and cultural effects across nodes, and point out important emerging themes and Science to Action (S2A) initiatives relevant to each node.

The central principle of the analysis was to select specific MMAs and then identify, beginning with the people who use or used or are or were associated with those marine locations, the shoreside communities where those people, live, work, or had significant involvement. The activities associated with the MMAs and the characteristics of the associated shoreside communities were then the focus of the cultural roles analysis.

For Belize, the analysis focused on the MMAs of Laughing Bird Caye National Park and Gladden Spit Marine Reserve, and the shoreside communities of Hopkins, Placencia, Seine Bight and Sarteneja. For Brazil, the MMAs were Abrolhos Marine Park, Corumbau Extractive Reserve and the recently created Cassuruba Extractive Reserve. Related directly or indirectly to these MMAs there are the shoreside fishermen communities of Nova Vicosá, Cassuruba, Caravelas, Alcobaça, Prado, Cumuruxatiba, Imbassuaba, Veleiro, Corumbau, Barra Velha indigenous village and Caraiva. In Fiji, analysis focused on shore side communities and their adjacent management regimes for the communities of Kubulau and Yadua in Bua, Qoliqoli Cokovata in Macuata, Sawaieke, Vanuaso and Navukailagi Tikina on Gau, Cuvu in Nadroga, Navakavu in Rewa, Verata in Tailevu, and Ulunikoro in Ono in Kadavu. In Panama, the analysis focused on the single major Marine Management Area of Coiba Island National Park, and the communities of Palmas, Rio de Jesus, Montijo, Mariato and Sona located around the Gulf of Chiriqui where the Coiba Island National Park is located.

II) Brief History of Coastal and Marine Management

The history of coastal and marine policy and management is quite different among the four nodes.

Belize

For Belize, the Belize Barrier Reef Reserve System was designated a world heritage site in 1996.¹ “The coastal area of Belize is an outstanding natural system consisting of the largest barrier reef in the northern hemisphere, offshore atolls, several hundred sand cays, mangrove forests, coastal lagoons and estuaries. The system's seven sites illustrate the evolutionary history of reef development and are a significant habitat for threatened species, including marine turtles, manatees and the American marine crocodile” (UNESCO). The Belize barrier reef (BBR) contributes around 30% to Belize’s GDP through commercial fisheries (conch and lobster), high-quality eco-tourism and recent boom in cruise tourism and private sector investments (for coastal development and aquaculture) (Cho 1995). The BBR is a precious resource which must be conserved for the long term economic health of the country and its coastal communities. However, the Belize barrier reef is threatened by human and activities such as over-fishing, agricultural chemical run-off and coastal development. As a result it has been the site of many

¹ The material in this paragraph is adapted from the text of the Belize Economic Valuation Workplan (Hargreaves-Allen), 2006

conservation efforts. NGOs working in Belize include; Wildlife Conservation Society (WCS), [The Nature Conservancy](#) (TNC), The [Belize Audubon Society \(BAS\)](#), World Resources Institute (WRI), The World Conservation Union (IUCN), the World Conservation Monitoring Centre (UNEP-WCMC). It has also been the beneficiary of many conservation grants e.g. from the Summit foundation, and a US\$8.355 million in UNDP/GEF funding related to enable Conservation And Sustainable Use of Belize's coastal resources, plus many conservation-orientated research projects e.g. Coral Cay Conservation and Earthwatch. However, its reefs remain threatened by many different sources (WRI, 2005), despite the effort the financial, legal and institutional investment in a network of marine protected areas, which form a major part of the country's conservation strategy.

Brazil

Brazil's wealth of marine biodiversity and commercially valuable artisanal fisheries are concentrated inshore, within 200 km of the coast. The pattern of decline in Brazil's capture fisheries follows the trajectory for capture fisheries for the world as a whole, showing production increases from 1960 through 1985, followed by a continual decrease up to the present. Virtually all of Brazil's offshore and shallow-water capture fisheries are stagnating or rapidly declining. Significantly, though, artisanal small-scale fishing still flourishes in some coastal areas, accounting for an estimated 60 percent of total fish landings in Brazil and 70 percent in the poverty-stricken northeast.

In Brazil, MMAs are being proposed as central environment management tool. The environment public policy for Conservations Units (known as SNUC) defines different categories of Conservations Units, divided basically in no take areas and sustainable use areas. Even though there are many efforts in creating those areas, there are scarce public and private resources for their relatively expensive and time-consuming planning and implementation processes.

The establishment of MMAs in Brazil reflects the fragmented planning of the country's land and water. In the case of marine resources, the Navy Ministry is responsible for all the water traffic, MPA (Ministry of Fishing and Aquiculture) is responsible for regulating fishing activity and deciding on fishing licenses, IBAMA is responsible on defining stock limits and to monitor the fishing activity, ICMBio for the definition and management of MMAS and the Ministry of Planning for the regulation and use of next to sea land. These instances work at the Federal Government level and can be replicated at State and Municipal levels. So, in Brazil, protected areas (conservation units) are divided into two broader groups: fully-protected areas (in several categories) and sustainable-use areas (also in several categories). Conservation units can be managed at the Federal, State or Municipal levels, depending upon the administrative level at which they were established, and also through partnerships with the private sector.

MMAS usually reflects local and/or NGOs and University effort for conservation and, in the majority of the cases, aren't part of a costal management effort. Even though there is some effort in consulting these different stakeholders in the issues related to the creation

of a MMAs, at the end of the creation process political pressures usually prevail on the creation (or not) of a specific area.

The MMAS 's management has to follow public policies defined by the Ministry of Environment and rules and regulations set by Instituto Chico Mendes de Conservacao da Biodiversidade (ICMBio), an autarchy created by a split of IBAMA. So, to describe de Management of MMAS in Brazil is necessary to refer to IBAMA.

The first National Parks of Brazil date the beginning of the XX century. In 1930 the forest code was defined and three National Parks were created. Until the 1970 all efforts of creating Conservation Units were aimed to land areas, mainly trough Parks and National Forests. The first Marine Conservation Unit was established in XXXX

In the 1980's many important Public policies defined environmental issues, specially the National Policy of Environment, the National System of Environmental Issues (SISNAMA) and the National Council of Environment OCONAMA). In the end of the decade IBAMA was created,

IBAMA was the autarchy responsible for implementing the public policies defined by the Ministry of Environment, including the definition and management of Conservation Units. This was systematized in 1992 trough the SNUC (National System of Conservation Units). In 2007

SNUC defines the type of protected area and the different types of management. For example, no-take areas, as, for example, Parks and Biological Reserves are created without the need of broad public audiences and are managed by an ICMBio administrator with the support of a Consultive Council. In the case of sustainable use conservation units, specially Extractive Reserves, there is a need for public audiences and agreement by the population involved in the establishment of the area and, once the unit is created, the Deliberative Council is formed and actions are taken to properly regulate the unit: user registration, dominial chain studies, indemnity processes and concession of use, given to an association that represents the extractors. An ICMBio administrator is appointed to oversee the joint management of the area as well as to mediate the demands of the population and of the State. So, different models of management are used, with different levels of participation of the communities around the area.

The MMAS project encompasses two different types of MMA: Park and Extractive Reserve.

Parks are no-take areas destined for visitation. Usually a Park is destined to safeguard a specific environment or a natural monument. A Park will have a small visitation area, with some "attraction" for the visitors and a large intangible zone, destined to research activities.

Extractive Reserves are a particular category of protected areas explicitly aiming to safeguard traditional population's livelihoods and culture, as well as to conserve the natural resources upon which they depend. This emerging model originated from the political and organizational struggles of Amazon rubber tappers (*seringueiros*) for socioeconomic and cultural survival. Going far beyond protectionism and strongly grounded in the common property theory, the ER model was conceived along the 1980's and inaugurated in 1990, with the legal establishment of the *Reserva Extrativista Chico Mendes*. The ER model explicitly questions the "inevitable destruction of collective resources" anticipated by Hardin (1968), proposing a turn in the current non-viable open-access regime into a user-regulated and user-monitored common management. Instead of locking people into tradition, ERs bear the potential to enhance integrated environmental management and coastal fisheries sustainability, helping coastal communities to preserve social and cultural values embedded in their fishing traditions, as well as to use their cultural rights and interests in new structures of resources' management. Despite the considerable growth and interest in the model, there are few reports dealing with the effectiveness and challenges faced by MERs .

Fiji

In Fiji, a dual system of coastal resource management existed; where an informal management system, devised and implemented by resource users and their Non Government Organisation partners such as WWF, World Conservation Society, Conservation International, IUCN and the University of the South Pacific coexisted with a formal government management system. This customary system was based on traditional practices that were handed down through generations as the cornerstone of the community-based resource management undertaken across the Pacific Islands. Contemporary experiences in Fiji showed the usefulness of some traditional practices despite the fact that the traditional system of resource use was formulated for a time long gone. (Veitayaki 2000:125). Although the customary system reflected the ethnic, clan, kin, class and gender situations and responsibilities, there was little consideration of the influence of cultural factors such as community leadership and governance. In other words, the assumptions were that the cultural system worked and that all the community members adhered to the decisions made by the groups and their leaders. MMAs were spreading quickly in Fiji as local communities were lobbied and convinced to protect their fisheries resources, which they realised, were in danger of depletion and overexploitation. The commitment in these local communities was demonstrated by the fact that even though the Fiji Government had proposed to have 30 per cent of all its waters managed by 2020, all of the 200 or so community-based resource management actions taken up to now had been by local communities using their customary rights. In all of these communities, the people had made the hard decision to protect and restrict the use of their marine resources. The challenge was to make these initiatives efficient in conserving the resources and in providing benefits to the resource owners and users.

Panama

For Panama, The Law project that create the Coiba National Park (CNP) was proposed by the teaching personal from the Regional University Center of Veraguas, an extension of the National University of Panamá. This project serves as a base with a few changes to the actual Law of the CNP that has existed since July 2004. In the beginning all the conservation efforts were directed to the natural area and its relationship to tourism. Studies in the different Districts of the MMA, include the culture but only as it relates to the topics of Education, Culture and Sports area, with results that have nothing to do with cultural heritage (CH) and its safeguarding. This is in part because the Estate does not have a clear approach to the consideration of CH in the political arena. The safeguarding of CH in Panama as a formal process does not exist. The culture is maintained by oral transmission from parents to children, the same way of others parts of the world. In Panama rural areas the fathers teach the boys all the necessary knowledge to survive the hardship of the countryside, and the mothers teach the girls their job at home. Mothers also possess much of the knowledge of the men and if the men are not present, women performs the functions of the community. To provide food by recollection, fishing or hunting or with agriculture, are arts that the “campesino” begin to learn in infancy and by necessity value this transmitted information. The different public and private institutions that worked and still work in the MMA, directed their conservation activities specially to the natural area and offer training to the population to improve their socioeconomic aspects of the use of mother nature. In all of those activities they do not take in account the traditional culture of the area, which is a central factor that affects all the aspects of the site’s biodiversity.

Many of the current challenges in coastal and marine management are common across all of the nodes:

- 1) Lack of sufficient scientific data and information, specifically the social and cultural characteristics of the affected populations;
- 2) Incomplete involvement of local stakeholders in the MMA development and implementation process;
- 3) Inadequate monitoring and enforcement; and
- 4) Illegal or unreported fishing.

We will discuss the situation in each of the nodes in more detail below.

III) Community Structure and Organization and Cultural Context

Belize

In Belize, the most prominent cultural aspect across the four communities is ethnicity: Sarteneja is characterized by Mayan and Mestizo heritage, Hopkins and Seine Bight by Garifuna heritage; and Planencia by Creole heritage. Because of historical circumstance (storms, erosion) Hopkins is a relatively young community compared to the others. Such circumstances (hurricanes) serve as “cultural markers” for the communities. All have

local religious and community festivals marking significant cultural and historical concepts and events. All four communities have local Village Councils in addition to other civic and commercial organizations, and various ties to the central government and political structure. All have some history of fishing cooperatives, although this varies significantly among the communities and in general the cooperatives have been less than stable. Ethnicity, kinship and religion play a strong role in the social organization of all four communities. Placencia has the strongest involvement with both local and outside marine-related NGOs.

Brazil

The communities studied share many cultural characteristics, which can also be found in other fishermen communities of Bahia: type of fisheries, boat characteristics, religion, traditional festivities. Between the communities there is an Indigenous village, which has some very specific cultural context and community structure. But, there are some differences, mainly related to the degree of urbanization of the different localities.

The urban infrastructure and the degree of commercialization of each locality have major impacts on the community structure. On one side of the spectrum there is the Indigenous village of Barra Velha, where only recently light was installed. In Barra Velha each member of the community has his/her role and community life is regulated by the council of leaders. Imbassuaba, Veleiro and Cassuruba are communities with strong traditional community structure, supported by family and “compadrio” ties. They are communities characterized by a strong agricultural activity. Corumbau, Caraiva and Cumuruxatiba are villages with a growing influence of the tourism industry, especially Caraiva. On the other side of the spectrum there are the cities of Caravelas, Nova Vicosa, Prado and Alcobaca, with urban infrastructure and community organizations influenced and mediated by market laws.

Fiji

Fijians lived in villages, which were the basis of Fijian organization. Originally small, the main size regulators were the minimum viable defense force or the maximum number that the food supplies would provide for (Frazer 1973:78–9). The village size increased over the years, however, the composition remained the same with each village consisting of one or more closely related clans. The clans were made up of *mataqali*, which were commonly the land owning units that included a number of extended families or *tokatoka*, which in turn were made up of individual households.

The village operated because the different groups consisting of *mataqali* or *tokatoka* within it had responsibilities they performed (Seruvakula 2000:21-29). From the different *mataqali* or *tokatoka* came the chiefs, heralds (*mata ni vanua*), warriors and planters (*bati*), fishers (*gonedau*), priests (*bete*) and carpenters (*mataisau*). People knew who they

were and what their roles were. This was why only the people who did not know themselves did not attend to their roles. The *sauturaga* were responsible for installing the chief and for maintaining the respect and order for the chief and the village. They ensured that all the responsibilities were carried out and that order was respected. They therefore could confront anyone that was not doing as expected.

The chiefs and their clansmen were the traditional owners and guardian of the land, waters, resources and the people. Fijians did not previously attribute a monetary value to land nor had any idea that land could be bought and sold for personal gain (Farrell 1972:38). In some communities, the close ties with the land and sea was demonstrated in the customary practices. The umbilical cords for girls were taken to the reefs and those of boys were planted with trees on land to keep the ties with the sea and the land and the traditional roles associated with these (Ms Alisi Daurewa 2008 Personal communication).

Customary marine tenure (CMT) referred to the formal or informal ownership of sea space by a group of individuals (Calamia 2003). Customary fishing areas were owned by Fijian groups. The use of customary fishing grounds by outsiders was permitted, provided access conditions were met. Some people believed that the system hindered economic progress, as the indigenous owners of the resources were not fully aware of the merits of proposed development projects in their areas and consequently opposed them.

The location and size of the tenured fishing grounds was another problem. The delimitation of these areas (between 1890s and 1996) was not based on biologically optimal management units but on historical developments and societal, traditional and geographic features. Thus, the sizes of fishing grounds and the quantities of resources contained therein were only weakly related to the sizes of the populations that depended on them (Muehlig-Hofmann *et al.* 2005).

Village life evolved from the time of European contact to this day. In 1864, the first Melanesian labourers were shipped to Fiji to work on the farms as local people, from a European perspective could not work well because of their custom and kin ties and had to be taken elsewhere to be productive. In subsequent years, some 20,000, Ni Vanuatus, I Kiribati, Tuvaluans, Tokelauans and Solomon Islanders were brought to Fiji (Narayan 1984:23). This labour trade was a dreadful way of treating people who had never worked under these 'western' conditions before.

Shifting cultivation, which provided the people with food for consumption and social obligations, was replaced by permanent farming practices that marked the beginning of the modernisation that continued today. Communication, health services, education and European goods featured in the villages only in the 1960s (Frazer 1973:78–9) but continued to change village life to mirror other modernising societies. Cash crops, wages and commercial activities were established in villages throughout Fiji.

Decision-making was transferred from the hereditary chiefs and community councils, to the government officials and magistrates. The role of hereditary chiefs declined while individuals and groups took on more independent roles. Fijian villages became unlimited

in size and were influenced by their proximity to urban areas. Furthermore, villagers were attracted to urban life, opportunities for higher income and a desire for higher status.

The Fijian chiefs ceded Fiji to Britain and became subjects of Queen Victoria in 1874. In 1970, with independence, the political leaders confirmed Fiji's dependence on the United Nations, the International Monetary Fund, the Pacific Forum, and other treaties that hung Fijians by the noose. For instance, after four coups in 20 years, the people were struggling with the National Charter for Building a Better Fiji (Daurewa 2008) to map their development path into the future.

Panama

Organization and community structure and cultural context.

In Panama, there are several things that stand in the cultural context in the MMA of Coiba. The population is rural with mixed Hispanic-Indian and Negro origin, but the dark skin prevails. Although the most important towns were created in the colonial period, most communities have less than 100 years of existence and in the last quarter of the twentieth century, the populations have lost their cultural identity by the advance of civilization represented by roads, schools and health centers. The migration to urban areas is great for improving education or in search of better income, due to limited employment opportunities in the region.

The religious heritage is very influential and is reflected in their fiestas, but they are daily mixed with beliefs about the influence of nature on the fate of their lives.

The community organization is based on the political system of the central government, but the community development, came mostly from NGO support. The few cooperatives are present in important cities of the district and the residents of remote and small populations do not have access to them.

With the boom of tourism and the depletion of marine fisheries, the large number of fishing boats and fishermen reported to the late twentieth century, is shrinking as the population directs its activities to these items that now are more profitable. The contact with urban areas that previously were not readily accessible and the presence of electricity allowed access to modern goods even if their lifestyle does not change.

IV) History of Fishing

Belize

For Belize, of the four communities Sarteneja is involved the most in migratory fishing all along the Belize coast, and in diving for commercial fishing. Placencia has the shortest social history of fishing, and has undergone the most complete transition from subsistence and commercial fishing to the leisure-tourism economy. Seine Bight has the

least historic involvement with commercial fishing. Hopkins lies somewhere in the middle on these parameters. None of the fishers from the four communities except Sarteneja historically travel very far from their home communities to fish, except to fish at Gladden Spit for snapper during the spawning season. Sarteneja is the only community where the number of commercial fishers (although not the number of boats) has increased significantly. For the rest of the communities, fishing has generally taken place in adjacent water, in and around the large number of cayes and banks that comprise the Mesoamerican Reef system. There is long history of nearshore gathering, seasonal use of local cayes, and fishing with various gear for finfish, lobster and conch. There is no formal system of fishing territoriality, in part because of the relatively low historical density of fishermen in comparison to the large number of potential fishing locations. Foreign fishermen, primarily from Guatemala and Honduras, some of whom fish legally and other illegally in Belize waters, is a long-standing issue, about which there is little or no data. Much of the most desirable fish (lobster, snapper-grouper) is exported.

Brazil

The fishing context of south Bahia (Abrolhos Bank and surroundings) has gone through many transformations. Since the grouper fishing, in the XVI century, the populations of Bahia's south are using marine resource, not only as a source of subsistence and social aggregations, but also as a economic resource, sending through external commercialization (dried grouper exported to Europe in the XVI and XVII centuries and de whale oil, used as a source of public illumination until the beginning of XX century).

Whale fishing started in the beginning of the XIX century, quickly becoming the region main economic activity. The proximity to the Abrolhos Archipelago (70 km from the coast), site for the reproduction of the humpback whale, made Barra de Caravelas a privileged location for the processing of whale fisheries. In the middle of the XIX century there were six enterprises focused in processing whale oil for the external market.

With the decadence of the whale oil market, fishing migrated to net and line fishing, in a traditional way. One can still listen to old Caravelas fishermen's stories of how they spent 3 days paddling in a canoe to reach the Archipelago of Abrolhos, with many kilos of salt, spent a week fishing and salting the fish and came back to sell their production to the external market. In other communities it was common to spend long periods at the beach in a fishing camp – rancho de pesca – fishing and salting the fish. So, until 1970's, fishing was a traditional activity, done in an artisanal way.

With the growth of urban centers and the possibility of freezing the fish, new patterns of fishing arouse. Small motor boats become more frequent and shrimp troll fishing started to be used. In some communities shrimp troll fishing is very recent, with less than two decades.

Fiji

Fiji is an archipelagic nation comprising about 322 islands with a total land area of 18,272 sq. km. and a surrounding EEZ of about 1.3 million sq. km. Most of the islands are surrounded by fringing and barrier coral reefs. There are substantial rivers, a few lakes and some man-made impoundments where fishing and aquaculture occur, but marine fisheries are predominant.

The indigenous Fijians control much of the inshore fishing areas and do most of the subsistence fishing, but a substantial portion of the coastal commercial fishing is carried out by descendants of immigrants from India.

Marine fisheries

Fiji's marine fisheries are estimated to generate annual landings of about 36,400 tonnes. Fishing is divided into three sub-sectors: subsistence, coastal commercial, and offshore/industrial. The distinction between subsistence and the coastal commercial fishing in the larger, less isolated islands is often blurred as small-scale fishing activity is becoming increasingly monetised in these areas.

The subsistence fishery targets mainly finfish, beche de mer, octopus, seaweed, lobster, mud crab, and various bivalve molluscs. These resources make a large contribution to domestic food supplies. It has recently been estimated that 50 percent of all rural households are involved in some form of subsistence fishing and that about 21,600 tonnes of fish are landed each year, or slightly more than half of all domestic production.

According to Fisheries Division data, 1,012 vessels and 2,304 fishers participated in the coastal commercial fishery in 1999. It is estimated that 9,320 tonnes of finfish and non-fish (i.e. invertebrates and plants) were harvested by this component of the fishery in 1999. By weight the finfish was responsible for about 52% of the landings.

The four most important exports from the coastal commercial fishery are beche de mer, trochus, aquarium fish, coral, snapper, and live food fish. According to the Fisheries Division, the annual production of beche de mer in the late 1990s was about 250 t. The 1999 production of trochus was estimated to be 92 t. In the same year the four aquarium fish businesses exported about US\$762,000 worth of aquarium fish and about twice that value in various forms of coral. Coral extraction is one of the most contentious issues in the fisheries sector. In 2000 about 80 tonnes of snapper was caught, of which 29 tonnes was exported. About 8.4 tonnes of live food fish was exported the same year.

A survey on the main Island of Viti Levu in the mid-1990s showed that 60 percent of small-scale fishing took place in lagoonal areas. Close to population centres, fishing driven by market demand has resulted in the over-exploitation of commercially important species in the inshore areas. Area closures and bans on gill netting for reef fish, particularly in the north and west of the country, have been taken to restore stocks of some species. Between 1998 and 1999 there was a 2.9 percent decrease in the number of fishing licenses issued for inshore waters. In the more remote areas, artisanal fisheries were not fully developed because they were constrained by lack of access to markets but these were quickly changing as commercial operators extend their sphere of influence outward.

The industrial fishery is entirely tuna-oriented and has the following components:

- a pole-and-line fishery, mainly targeting skipjack and small yellowfin tuna. This fishery has declined in recent years. Problems related to access to bait fishing areas and the economics of pole-and-line fishing are the major factors for the decline.
- a longline fishery targeting large bigeye and yellowfin tuna, taking most of its catch within Fiji fisheries waters, and landing the chilled catch for export by air to fresh fish markets in the United States and Japan. The fleet of domestic longliners has increased substantially. In recent years there have been between 40 and 50 vessels and landings are now about 5,500 tonnes per year.
- a freezer longline fishery involving mainly Taiwanese vessels fishing under charter to the Pacific Fishing Company (PAFCO). These vessels, which target mainly albacore tuna, fish within Fiji's EEZ as well as the EEZs of neighbouring countries, and international waters in the area. These vessels have landed between 2,000 and 3,000 tonnes of tuna in recent years, primarily at the PAFCO tuna cannery in Levuka, but with some transshipment to other destinations.
- an occasional tuna purse seine fishery in the northern portion of the EEZ under the terms of the U.S. multilateral treaty. US and occasionally other purse seine vessels sometimes visit Fiji but this is usually only to obtain duty-free fuel. Actual fishing by these vessels normally only occurs in El Niño years, at which times it takes place in the extreme north of the country.

Apart from the multi-lateral tuna treaty with the United States, under which only sporadic fishing occurs, Fiji has access agreements in place with Japan, but only a very small amount of fishing has been done by Japanese vessels in Fiji waters in recent years.

Inland fisheries

The freshwater mussel (*Batissa violacea*) is the major freshwater species of commercial importance. It has been estimated that market sales of this species is around 1,000 tonnes per year. Other inland fisheries for species such as freshwater prawns (*Macrobrachium* spp.) and fish, are at the subsistence level and there is no estimate of the amount of catch.

Aquaculture

The most important form of aquaculture in Fiji is the culturing of various species of tilapia (*Oreochromis* sp.). In 1999, subsistence and semi-commercial farmers produced a total of 297 tonnes from 46 ha. of tilapia ponds in 16 commercial and 268 subsistence farms.

Culture of giant clams (*Tridacna* sp.) is undertaken at the Fisheries Division's mariculture research facility on Makogai Island. In 1999 about 270,000 clams of various sizes were being maintained at the ocean and land nurseries for distribution to reefs around the country.

Two local companies produced about 150 to 200 tonnes of penaeid shrimp annually in the late 1990s. A single farm cultures black-lip pearl shell (*Pinctada margaritifera*) for pearl production in north-eastern Viti Levu. A pearl farm was set up at Nasavusavu with funding and technical assistance from ACIAR and ICLARM. About 3,000 pearl shells are cultured at the facility.

In 1999 a beche de mer hatchery was set up for studying the techniques of breeding and re-seeding reefs with juveniles.

Farming of *Eucheuma* seaweed took place during the late 1980s but ceased in the early 1990s, mainly as a result of changed market conditions. It was revitalized in the late 1990s under a promotional scheme known as the Commodity Development Fund. In 1999, 632 farms produced seaweed for export.

An initiative is currently under way to culture milkfish (*Chanos chanos*) for use as tuna longline bait. Twenty ponds of five hectares each have been constructed in 1998 and 22 additional sites were surveyed for development in 1999.

Attempts have been made to culture various other species in Fiji, but these have generally been unsuccessful. These have included bass carp, bivalves (*Anadara*, *Gafarium*, and *Batissa*), cockles, mangrove crab, molly (*Poecilia mexicana*), mullet, green mussel, eleven species of oysters, freshwater prawns, rabbitfish, tarpon, two species of donor fish (*Puntius* sp.), and two species of turtles.

Utilization of the catch

Most of the fish from inshore waters is consumed fresh locally. According to the Fisheries Division, about 70% is for home consumption by the harvestors and the remainder is sold through municipal markets and other outlets.

The beche de mer is dried and processed locally and exported to China by 13 licensed companies. Exports peaked in 1988 with 700 tonnes. The trochus is made into button blanks which are then exported to button factories in Asia and Europe. Aquarium fish are air freighted to the west coast of the United States and Europe.

There are a few small canneries and two major fish canneries in the country:

- the Pacific Fishing Company (PAFCO) cannery at Levuka on Ovalau Island, which cans domestically caught and imported tuna, principally for export and produces tuna loins for overseas canneries;
- the Voko cannery outside Suva, which cans imported mackerel, mainly for the domestic market.

In 1999 PAFCO exported about US\$8 million of canned tuna and tuna loins. In 2000 the value was about US\$7.1 million for the 9,920 tonnes processed. During the same year about 5,000 t of fresh chilled fish (mostly tuna) were exported by air freight, mainly to the United States and Japan.

Demand

Studies in the mid-1990s have shown that 99.3% of coastal villages on the main island consume marine products at least once per week and that 50% of all rural households participate in fishing activities. The per capita consumption of fish has been estimated by the Fisheries Division to be between 44 and 62 kg in recent years. This is comprised of 45% subsistence production, 15% artisanal production, and 40% imports (both canned and frozen).

Economic role of the fishing industry

It has been recently estimated by the Asian Development Bank that the catches by subsistence fishing are worth US\$24,675,061, by coastal commercial fishing US\$15,231,519, and by locally-based offshore fishing US\$25,639,724. The same study also calculated that fishing is responsible for about 2.4 per cent of Fiji's GDP. With fish

processing and other post-harvest activities, the contribution of fisheries to the economy of Fiji is substantially larger than the 2.4 per cent from fishing alone.

The 1996 census shows that fishing provides jobs to 2.22% of the 280,505 people formally and informally employed in the country. The census indicates that an additional 1,100 people are employed in "processing fish". Fishery products represent 6% of the value of all commodity exports from the country.

Fiji receives about US\$212,000 annually in fees for access by foreign fishing vessels to Fiji waters.

Development Prospects

The use of fish aggregation devices (FADs) by artisanal fishermen will allow them to utilise the large offshore tuna resources, thereby diverting effort away from the heavily-exploited inshore and coastal areas.

Aquaculture production, although still quite small, is gaining momentum. Tilapia farming, which has been carried out for several decades at the subsistence level, is now being attempted on a commercial scale. The production of penaeid shrimp has expanded recently and this trend will probably continue. Export oriented aquaculture will continue to face stiff competition from countries with low production costs and efficient transportation links to major markets.

The scope for increasing production from inshore and coastal areas is generally considered to be limited, and the government is focusing an increasing amount of attention on the management of over-exploited inshore fisheries. A central feature of the new management initiatives is the devolution of management authority to local government units and, beyond this, to coastal communities having traditional rights of marine tenure.

There is nevertheless scope for improving the value of the landings from coastal and inshore fisheries, mainly through improvements in the post harvest area. Increased use of ice and value-adding activities appear to be the most promising areas for future development. The scattered nature of the islands presents difficulties for marketing, but the growing demand for fishery products presents new opportunities for many of Fiji's islands. As a consequence, there is a need for improved fish transport arrangements and practices so that fishery products can be harvested in rural areas for marketing in urban centres.

Much fisheries development activity in the past has been carried out by government, but in future if this could be devolved to the private sector so that the government focus more closely on fisheries management issues. This change in focus will involve skills that are not presently available, and some re-training of government staff will probably be required. Mechanisms need to be developed to ensure that any government interventions in the fisheries sector are relevant to the interests of stakeholders.

Institutional Arrangements

The laws governing the use of marine resources in Fiji are set out in Chapters 158 and 158A of the Laws of Fiji. Chapter 158 is also known as the Fisheries Act. The main features of the Act are that it:

- Defines the Fiji fisheries waters as all internal waters, archipelagic waters, territorial seas and all waters within the exclusive economic zone;
- Establishes a Native Fisheries Commission charged with the duty of ascertaining the customary fishing rights in each province of Fiji;
- Prohibits the taking of fish in Fiji fisheries waters by way of trade or business without a licence;
- States that every licence granted under the Act terminates on the 31st December next after the day of issue, licenses are personal to the holder, and licenses are not transferable;
- Empowers any licencing officer, police officer, customs officer, honorary fish warden and any other officer empowered by the Minister to enforce the Act;
- Empowers the Minister to appoint honorary fish wardens whose duties shall be the prevention and detection of offences;
- Empowers the Minister to make regulations (a) prohibiting any practices or methods, or employment of equipment or devices or materials, which are likely to be injurious to the maintenance and development of a stock of fish; (b) prescribing areas and seasons within which the taking of fish is prohibited or restricted, either entirely or with reference to a named species; (c) prescribing limits to the size and weight of fish of named species which may be taken; (d) prescribing limits to the size of nets or the mesh of nets which may be employed in taking fish either in Fiji fisheries waters or in any specified part thereof; (e) regulating the procedure relating to the issue of and cancellation of licences and the registration of fishing boats and prescribing the forms of applications and licences therefore and the conditions to be attached; (f) prescribing the fees to be charged upon the issue of licences and the registration of fishing vessels which fees may differ as between British subjects and others; (g) regulating any other matter relating to the conservation, protection and maintenance of a stock of fish which may be deemed requisite.

Several fisheries regulations have been made under the Fisheries Act. These have been consolidated into the Fisheries Regulations 1992. The regulations cover licenses/registration, prohibited fishing methods, mesh limitations, size limits, and exemptions. These regulations were modified twice in 1997. (Notices 17/97, and 65/97)

The Marine Spaces Act (Cap. 158A) establishes the archipelagic waters of Fiji and a twelve nautical mile territorial sea. The Act also establishes a 200 nautical mile exclusive economic zone over which Fiji has sovereign rights for the purposes of exploring and exploiting, conserving and managing the natural resources of the seabed, subsoil and superjacent waters. Formal declaration of the archipelagic waters and the exclusive economic zone is contained in the Marine Spaces (Archipelagic Baselines and Exclusive Economic Zone) Order.

The management of living marine resources in Fiji is the responsibility of the Fisheries Division of the Ministry Fisheries and Forests. The Division's organisation reflects Fiji's national administrative divisions, so that divisional offices are located in Lautoka (Western Division), Labasa (Northern Division), Nausori (Central Division) and Lami (Eastern Division). To better serve rural fishers, the Division also maintains offices at Rakiraki, Tavua, and Ba, in Western Division; Taveuni, Savusavu, Lekutu and

Nabouwalu in Northern Division; Navua, Tailevu and Wainibokasi in Central Division; and Lakeba, Vunisea and Levuka in Eastern Division.

International Issues

The Fisheries Division maintains direct contact on technical issues with regional and international organisations dealing in fisheries. Policy and other matters are managed in the first instance through designated contact points, most often the Ministry of Foreign Affairs.

Fiji is a member of the Secretariat of the Pacific Community (SPC), the South Pacific Forum Fisheries Agency (FFA) and the South Pacific Regional Environmental Programme (SPREP). Fiji is also party to a number of treaties and agreements relating to the management of regional fisheries, including:

- the Treaty on Fisheries Between the Governments of Certain Pacific Island States and the Government of the United States of America;
- the Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific; and,
- the Niue Treaty on Cooperation in Fisheries Surveillance and Law Enforcement in the South Pacific Region.

Fiji was the first signatory to the United Nations Convention on the Law of the Sea (UNCLOS) and is a signatory to:

- the Agreement for the Implementation of the Provisions of the United Nations Convention of the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks;
- the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean;
- the Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Research and Training

The Fisheries Division plays an active role in research in support of resource assessment, development, management, and aquaculture promotion. The Division has a research section within its Lami headquarters, which carries out a range of research and monitoring projects, as well as freshwater aquaculture research stations at Naduruloulou and Dreketi and a mariculture research station on Makogai island.

Past research activities carried out by the Fisheries Division include:

- Aquaculture research: beche de mer, tilapia, pearl oysters, carp and milkfish;
- Monitoring of sales of fish, invertebrates and aquatic plants through Fiji's main markets;
- Study of the nature and extent of the subsistence fishery;
- Assessment of baitfish stocks and of the impacts of baitfish harvesting on juveniles of other commercially important species;
- Experimental culture and re-seeding of giant clams (*Tridacna* spp);

- Stock assessment of fresh-water prawns (*Macrobrachium* species), fresh water mussels (*Batissa violacea*) and mud-crabs (*Scylla serrata* and allied species).

The University of the South Pacific (USP) also regularly undertakes marine research activities in Fiji, often focusing on commercially important species. The University has undertaken biological studies on sea cucumbers, deep-water shrimps and marine algae, as well as carrying out social, economic and post-harvest research relevant to fisheries.

Two main institutions offer education and training relevant to fisheries:

- the University of the South Pacific, which is based in Suva, offers diploma and degree courses in fisheries and marine biology as well as specialisations in maritime law and post-harvest fisheries;
- the Fiji Institute of Technology (FIT) offers training in engineering, refrigeration and other vocational skills relevant to the fishing industry. The Fiji School of Maritime Studies, which is a branch of FIT, offers seamen's training and certification, including various classes of skippers and engineers licenses.

In addition, many members of the Fiji fisheries sector have undertaken training at overseas universities and technical colleges.

Aid

Fiji receives technical assistance in the fisheries sector from a number of bilateral donors including Japan, Australia, New Zealand, the United Kingdom, the European Union, and the United States. Assistance is also obtained from the international organisations of which Fiji is a member, including FAO and other United Nation agencies. The regional organisations serving Pacific Island countries, including the Forum Fisheries Agency, the Secretariat of the Pacific Community, the South Pacific Regional Environment Programme, the Forum Secretariat, and the South Pacific Applied Geoscience Commission, as well as several UN agencies (UNDP, ESCAP) have also been active in supporting Fiji's fisheries sector.

Some of the major recent donor interventions are: Australian Centre for International Agriculture Research (giant clam resource management), Foundation for the Peoples of the South Pacific (coral reef management), the South Pacific Regional Environment Programme (marine turtle management), the Secretariat of the Pacific Community (assistance with community initiatives in coastal resource management in Macuatu), World Wide Fund for Nature (coral reef management), and Biodiversity Conservation Network in association with the University of the South Pacific (community-based coastal resource management in Verata).

Panama

The exploitation of the pearl oyster already existed in the region at the time of the aborigines. Mariato has “concheros” and many indigenous implements throughout the area but has not conducted a study to determine the time of the activity.

The Spanish colonists forced the native to extract the oyster for their benefit, resulting in harsh working conditions that were subsequently banned by the Crown. The island of

Coiba, the Puerto del Morro in coastal Remedios, Parida Island, and the islands of Montijo, were used for pearl extraction complemented with the extraction of coral, turtle fishing, extraction of purple snail, harvest of coconuts and fishing. Fishing was done with the sole function of feed the divers and their masters.

During the nineteenth and early twentieth century, Coiba was an operations center for the pearl oyster industries. In Pixvae by 1910 the population was engaged in pearl oyster fishing as the main economic activity.

This industry lasted until after the War of a Thousand Days, in which the deposits of oysters were exhausted.

Until 1970, fishing was carried out in small wooden boats and the product was exclusively for personal consumption. The first activity of the community was the agriculture.

The fishing and coconut extraction were not performed in Coiba because the existence of the prison. Shrimp and prawn were caught in the Gulf Islands and their surroundings.

The Chinese Mission of Taiwan, taught fishing and the use of lines to avoid the trammel but introduced the trammel “volantin”.

The general view is that what hurt more the Gulf was the introduction of the industrial shrimp boat.

V) History of Fisheries Management (Each Node)

Brazil

Fisheries management in Brazil is an attribution of different stakeholders, each with a role in the management process. This fragmentation can be partly explained by the history of fisheries management.

The first activity of organizing Brazilian fisheries was in 1846, with the division of fishermen in fishing districts. The management of fisheries was done by the Navy and professional fishermen had to be registered. In 1912 the management of fisheries became responsibility of the Agricultural Ministry, for a few years, returning to the Navy in 1919.

In 1918, 800 fishermen guilds were created, with the registration of 100.000 fishermen. The guilds responsibilities involved points of fishing control, coast monitoring and the possibility of support the National defense trough fishermen mobilization.

In 1932 the Department of Hunting and Fishing is created in the Agriculture Ministry. With this department the sector became more technical, with efforts to better train the

fishermen. In 1942 the Fishermen Guilds were subordinated to the Navy Ministry, with the technical orientation and training still a responsibility of the Agriculture Ministry.

In the 1960's, in the movement of Brazil industrial development, SUDEPE (Fishing Development Division) was created and many public polices installed to finance the development of industrial fishing, with the support of external agents (FAO, USAID, for example). In this decade there was also reorganization in the Fishermen Guilds, with the establishment of a Confederation. The guilds weren't subordinated to the Navy Ministry anymore.

The artisanal fishing management was addressed only in the 1970's, with PESCART (Plan of assistance to the artisanal fishing). In PESCART effort many guilds were reorganized. PESCART activities were transferred to the Instituto de Pesquisa e Desenvolvimento Pesqueiro in 1980.

In 1989, with the establishment of IBAMA, SUDEPE was extinguished and its activities transferred to IBAMA, which become responsible for fisheries management. With this change fisheries management started to incorporate environmental issues, specially regarding stock administration.

In 1998, in a administrative reorganization of all Ministries, the responsibility of fishing production support was transferred to the Ministry of Agricultura, Pecuaria e Abastecimento. IBAMA continued to be responsible for the preservation, conservation and sustainable use of fisheries management. Five years later, in 2003, SEAP (Special Secretary of Fishing and Aquiculture) was established, to support the Presidency in the formulation and implementation of policies addressed to the fishing and aquiculture production. SEAP become the Fishing Ministry in 2008.

Nowadays IBAMA still responsible for controlling the stock while the Fishing Ministry is responsible for the fishing activity, including registration of fishermen and boats.

Fiji

The traditional marine resource management system was promoted to meet existing conditions where the people were mere spectators and the state was responsible for all the resource management activities. Heavy fishing of the reefs caused extensive damage because of the destructive fishing methods used. The increases in population were a cause of the threats to coastal fishing areas.

Moreover, overfishing due to commercial and subsistence fishing was driving people further into deep and distant areas increasing their costs and threatening their sources of livelihood. Poaching was common even in MMAs, while destructive fish drives were still conducted in villages such as Uruone in Vanua Balavu, Vanuaso, Nacavanadi, Malawai and Lamiti villages on Gau. These destructive fishing methods were blamed for the extensively damaged reefs and the dominant algae and seaweed cover along the coast. Other major threats to customary fishing grounds included pollution and sedimentation

associated with poor farming practices (Veitayaki 2006). Throughout the country, the increasing use of pesticides was affecting the marine environment. In Mualevu Tikina in Vanua Balavu, the villagers were asking why the destructive chemicals were being introduced when they were so damaging to the environment. In Tuvuca, fruit trees were forbidden to be grown near the village, while cassava was allowed but was poisonous. The burning of hillsides was a common problem across Fiji.

Customary roles and duties used to be much clearer in the past but were blurry today. The traditional tenure system and resource management strategies that had been prevailing throughout the region experienced gradual erosion with the increased impact of colonization in the 20th Century (Govan 2009:25). While traditional roles and resource use systems within the communities were still more or less well defined, leadership structures, protocol, respect and beliefs were undergoing changes and their usefulness and relevance were questioned by an increasing number of people (Vunisea 2002).

In addition, Muehlig-Hofmann (2008) supported the notion that *qoliqoli* and other traditional systems were unable to cope with the rapid exogenous change independently and hence failed to meet the role in fisheries management, which many believed they were capable of fulfilling (Anderson and Mees 1999). Whilst there was strong support for the MMA, there were people who believed that the length of the closure was too long and that the area should be periodically opened (van Beukering *et al.* 2007). In the Qoliqoli Cokovata communities in Macuata, the high number of primary and secondary school drop outs, who already had limited livelihood options, added more pressure to the already diminishing marine and terrestrial resources of the area (WWF 2006).

VI) History/Structure/Operation of Specific MMAs

Belize

For Belize, Laughing Bird Caye was designated as a National Park under Statutory Instrument 94 of 1996 under the National Parks System Act (Belize National Parks System Act, Revised Edition 2003). As previously mentioned, management of LBCNP is under a co-management agreement with the Belize Forestry Department and FoN. Under the National Parks System Act (Revised Edition 2003), however, the Conservation Division of the Forestry has formal responsibility for LBCNP. It is also a World Heritage Site, designated by UNESCO in 1998 (Pomeroy & Goetze 2003). Its name sake is the Laughing Gull, *Larus articilla*, the only bird found within the park during initial biological surveys, and whose calls sounds like laughter (Friends of Nature 2008). In addition to the Laughing Gull, this MMA protects habitat for at least 5 other bird species and several marine species, and is a nesting site for sea turtles (Friend of Nature 2008). This National Park is almost 4100 hectares in size and is located 12 miles south of Placencia Village, the closest mainland community (Goetze 2005). The first documented use of the LBCNP was in 1979 by tourists and fishers that used the caye as a fishing campsite and the faro, a rhomboid-shaped reef from which fish were extracted (Friends of Nature 2008). In 1988, the caye was surveyed for proposed development, which sparked

strong opposition from local stakeholders, in particular, Placencia and inspired them to sponsor a petition for designating the caye as a reserve (Friends of Nature 2008). According to the managing director of Friends of Nature (FoN), “*it was vital to the people of Placencia that the area would not go into private hands because of its nearness to the peninsula community*” (Personal Communication, May 2008). FoN’s managing director also mentioned in that in addition to preserving the natural beauty of the caye, the emergence of eco-tourism and its potential for negative impacts on the fragile ecosystem, due to the anticipation of high tourist visitation, strengthened the case for preserving Laughing Bird Caye. In 1990 five communities, Hopkins, Independence, Seine Bight, Monkey River and Placencia, were consulted regarding protecting LBC and within six years, the Government of Belize declared it a National Park. It is a strict “no-take” MMA with three management zones: (i) preservation; (ii) buffer and (iii) recreational. Since LBC became a no-take protected area, Garbutt notes that the number of traditional users has dropped precipitously (Goetze 2005).

Gladden Spit and Silk Cayes, due to their close proximity, were jointly declared the Gladden Spit and Silk Cayes Marine Reserve (GSSCMR) in 2000 but it was not until 2003 that it was legally established by Statutory Instrument 95 under the Fisheries Act (Belize Fisheries Act, Revised Edition 2003; Goetze 2005). Gladden Spit Marine Reserve (GSMR) is an important spawning aggregation site for several commercially important fish, such as mutton snapper, whose spawn attracts whale sharks at specific times of the year (Friends of Nature 2008). Several coastal communities have capitalized on this biological event by arranging limited whale shark (*Rhincodon typus*) tours for local, regional and international tourists to the site (Personal Communication, Friends of Nature Staff, May 2008).

GSMR is believed to have been used by fishers ever since the 1920’s to harvest mutton snapper. Today, that tradition still occurs as fishers congregate each year at Gladden Spit during mutton snapper spawning season, a ten-day period on full moon days beginning in March and ending in June (Goetze 2005). The use of scuba gear and gill nets for extractive purposes is strictly prohibited in this MMA (Personal Communication, Friends of Nature Staff, May 2008). It is the opinion of FoN’s managing director that since GSMR’s designation, the number of fishers that visit the site has become less overall and the number fluctuates from year to year. Fishers from Sarteneja, a tiny fishing village in the northern most tip of the country have been identified as the primary users of marine resources within GSMR (Personal Communication, May 2008).

Gladden Spit is a multiple use protected areas with four management zones. As depicted in the figure below, these zones include: (i) General Use Zone; (ii) Conservation Zone; (iii) Restoration Zone and (iv) Special Use Management Zone (Cohun 2005). As the name implies, a range of extractive activities are allowed within the General Use Zone. These activities are nevertheless managed. Fishing gear is restricted to hook and lines and free-diving techniques. The Conservation Zone includes three small cayes known as the Silk Cayes, and only non-extractive and moderate recreational activity permitted. The Restoration Zone was set-up specifically to support the reestablishment

of Queen conch (*Strombus gigas*) population, while the Special Management Zone is a dedicated area to protect spawning reef fish and whale sharks (Cohun 2005).

According to FoN's managing director:

“the emergence of science, particularly the existence of spawning aggregation sites led to its protection. Scientists from TNC drove its demarcation and that's how the specific area of protection was chosen” (Personal Communication, June 2008).

The director also claims that FoN did its best to include all stakeholder villages during the consultation process, but not every one supported the idea of declaring the area as protected:

“A lot of meetings were held in fishing communities. There was not a lot of resistance to the idea of GS being protected but there was not 100% support for it either. We had consensus and most of the individual communities supported it”.

FoN is confident that regular patrols and enforcement of the law has resulted in effective management of the area, with low recorded instances of poaching. Friends of Nature (FoN) is a conservation non-governmental organization (CNGO) based in Placencia, Belize that co-manages Laughing Bird Caye National Park (LBCNP) and Gladden Spit Marine Reserve (GSMR) along with the Forest and Fisheries Departments of Belize respectively (Pomeroy & Goetze 2003). FoN was formed in March 2002, the result of an amalgamation of two community-based groups, Friends of Laughing Bird Caye which was formed in the 1980s and Friends of the Placencia Lagoon which was formed in 1998 (Goetze 2005). Both groups formed as a result of environmental activism by residents of Placencia who were genuinely concerned about protecting the ecological integrity of the ecosystems at Laughing Bird Caye and the Placencia Lagoon from the threats of tourism development (Pomeroy & Goetze 2003). These residents included fishers, dive and tour guides and business owners (Goetze 2005).

With time, FoN grew from being a Placencia-based organization to a well-known and respected local CNGO of southern Belize. This development was accomplished primarily through building partnerships with other community stakeholders, such as Seine Bight, Independence, Hopkins and Monkey River villages. A member from each of these villages, usually the Village Chairperson, sits on FoN's advisory committee (Pomeroy & Goetze 2003).

The staff of FoN consists of a managing director, administrative personnel and a team of research scientists and enforcement officers, the latter often referred to as “rangers” (Pomeroy & Goetze 2003). Rangers are trained as Fisheries Officers and thus have authority to enforce relevant sections of the Belize Fisheries Act (Personal Communication, Belize Fisheries Department Staff, July 2008). These rangers also coordinate with other agencies such as international and local CNGOs and government departments responsible for natural resource management. Village council chairpersons from each stakeholder community that sit on the advisory committee are expected to serve as liaison between FoN and users of LBCNP and GSMR from their respective communities (Personal Communication, Friends of Nature Staff, June 2008).

In addition to protecting and managing the MMAs, FoN also carries out community education and outreach projects in six neighboring coastal communities that include the villages of Hopkins, Independence, Monkey River, Placencia, Seine Bight and Sittie River (Personal Communication, Friends of Nature Staff, June 2008). A map of the MMAs in relation to these communities is depicted in Figure 3 below. Some activities include establishing and maintaining environmental youth groups in the six communities and implementing the *Community Field Studies at Laughing Bird Caye National Park Project* (Friends of Nature 2008). Informants from both Seine Bight and Hopkins said that several children have benefited from summer programs and scholarships to attend high school through FoN.

According to FoN's managing director, "*about 15 to 16 percent of our income comes from collected user fees but the bulk of our money comes from outside sources*" (Personal Communication, May 2008). FoN currently relies heavily on grants from "*big foundations*" and has to secure a minimum of \$750,000 each year in order to meet basic expenses. However, this money does not cover projects or research so FoN also raises funds through its membership drive (Personal Communication, Friends of Nature Staff, May 2008). In an effort to use limited resources more efficiently, it has recently teamed up with another Belizean CNGO, Toledo Association of Sustainable Tourism and Environment (TASTE), at the beginning of September 2008 in an effort to use personnel and financial resources more efficiently. This result of this amalgamation is a new NGO known as SEA Belize, the Southern Environmental Association of Belize.

Brazil

For Brazil, the ongoing process observed in the Abrolhos Bank, starting with the creation of the Abrolhos National Marine Park in 1983, intermingled by the creation of Corumbau Marine Extractive Reserve, in 2000, the establishment of a 95.000 km² buffer zone in 2006 and the creation of Cassuruba Marine Extractive Reserve in 2008. represent a unique framework to explore these challenges. There were specific driving forces for the establishment of each area.

The driving forces for the creation Abrolhos National Marine Park came from the Academic Community, especially marine biologists interested in the preservation of the Abrolhos Coral Reef, the second largest of the world.

The creation of an ER is a process that includes a succession of events and a long mobilization process, rather than only one significant happening. In Corumbau Extractive one event is always remembered: when fishers from Ponta do Corumbau are asked about those early days: the closure of the mouth of Corumbau river in 1999, in order to avoid the landing of shrimp by outsiders (in one occasion, as much as 200 boats were trawling in front of the village). In September 2000, in spite of some resistance inside the government and after many lists of signatures, publicity in the National press, and tremendous support from the Ministry of the Environment and CNPT, the decree creating MERC was finally signed, during the festivities of Brazil's 500 years.

The first movement of Cassuruba's establishment was also related to fishermen from other locations: crab fishermen, from the another state, after deploying their mangrove because of overfishing, migrated to Cassuruba mangrove to explore crab, using carbonic gas. The claim for the creation of an Extractive reserve was sent to IBAMA in 200.. In 2005 the socioeconomic studies for the reserve creation were conducted and in 2007 several public hearings took place. The Reserve was decreed in 2009.

The management of a Park, as Abrolhos National Marine Park, involves a Park chief, usually an environment analyst, appointed by ICMBio Management. The Abrolhos Park has two or three analyst that support the Chief and a staff of contracted workers, responsible for the Park boat operation, security and monitoring (the park guards stay at the Archipelago, in turns, lodged in a house). The Park chief is the representative of ICMBio president locally and has to follow ICMBio Legislation and Brazilian's laws regarding public administration. The Park has a Counsultive Council, which meets monthly, composed of local government representatives, NGOs representatives and civil Society representatives. To guide the Park use there is a Management Plan and a Public Use Plan.

An Extractive Reserve management has, as a premise, a co-management regimen, shared between the State, ICMBio, and the local beneficiaries. On the State side, IBAMA is responsible for the establishment and coordination of ERs, but suffers from a chronic lack of infrastructure and personnel. Moreover, MER implementation policies have not been fully institutionalized within IBAMA, and even less so incorporated by the fishers, setting back the implementation process and turning co-management into an even greater challenge. On the community side, it is necessary to consider that Brazilian small scale fishers have historically been socially marginalized (Cordell 1989), and a number of negative experiences have left fishers wary of any Governmental interventions. For instance, subsidies to diesel, energy, ice and infrastructure rarely reach the artisanal sector, although they flow abundantly into industrial fisheries and aquaculture plants. None of the benefits to artisanal fisheries envisioned by the Presidency's Special Fisheries Secretariat (SEAP-PR, the so called "Ministry of Fisheries") have ever reached most MERs (and the artisanal sector as a whole), including Corumbau and Cassuruba Reserves.

An Extractive Reserve has a Deliberative Council, composed of half plus one representatives of the beneficiaries (in the case of Corumbau and Cassuruba, traditional fishermen). Since the premise is a co-management regimen that decides about the Reserve Management, respecting the legislation and those duties that are exclusive to the State (e.g. law enforcement). One of the activities of the Deliberative Council is the approval of the management plan, that should state who are the beneficiaries and the rules of sustainable use of the resources, monitoring process, including the definition of no-take areas.

Fiji

Community based resource management is undertaken by community groups that are convinced of the need to better look after the marine resources they depend on. These

communities that are supported by their partners and are beginning to realize positive changes to their fisheries resources as well as their own are working together but are dealing with a wide range of development and conservation issues. The variety of the sites included in this assessment highlighted the focus taken in different community based resource management sites.

These community based resource management initiatives listed below are part of a formal network of Fiji Locally Managed Marine Areas (FLMMA). The FLMMA network is a forum, which brings together community members, researchers, relevant government officials, and resource management practitioners in Fiji to share conservation lessons and to learn more about effective resource management practices at the community and national level. FLMMA's approach encourages local communities in Fiji to play an active role in the management of their natural resources. Using an "adaptive management approach", FLMMA believes that the local people should plan, design, implement and evaluate resource management strategies because this is the group best schooled in the ecological settings and socio-political capabilities of the community. The FLMMA approach not only addresses resource management through environmental awareness but also focuses on capacity building of local people in areas such as effective village systems, communication, financial management, youth and women development, and proper governance of village institutions (van Beukering et al. 2007:6).

The project in Gau Island in Lomaiviti Province, is on Fiji's 5th largest island, which is divided into three administrative units (*tikina*): Sawaieke, Navukailagi and Vanuaso. Gau Island has a cloud forest in its interior where the endemic indigenous bird Kacau (Fiji Petrel *Pseudobulweria macgillivrayi*) is found. The forests in Gau Island have never been logged and provide people with healthy resources such as clear waters, wild food and building materials and specific items.

Gau Island is home to around 3,000 people, all indigenous. Semi subsistence farming is the main activity. With modern changes, people are rapidly expanding their areas of secondary vegetation and are progressing towards their virgin cloud forest that covers the mountainous interior. The villages and settlements are all on the coast, the part of the island where human activities have been most profound, but the people own all the land up to the mountains and out to sea. The pressures placed on the use of coastal resources in Gau Island are now felt in the villages and settlements. This project should allow people to address resource management issues while maintaining a health environment which is the basis of all their development aspirations

The main aim in this project is to involve the whole island of 18 villages and 7 settlements in integrated resource management that enhances community livelihood and undertake sustainable development practices in the use of their natural resources and associated land use practices. Gau Island is predominantly in its pristine conditions because the people are mostly semi-subsistence but is being threatened by the impact of development activities that degrade natural habitats. The proposed project aims to allow the people in Gau Island to articulate integrated resource use practices to enable them to improve their living condition through rural development that respects the integrity of

their natural environment and resources. The proposed project activities will compliment and enhance the resource management activities that the people are already undertaking in their marine environments.

The proposed project aims to make Gau Island a place where the people formulate and implement resource use and management plans for their villages and island. The most appropriate plans from each of the villages will be put into use. These plans must be appropriate and implemented by the people taking into consideration some conditions of environment management. At the moment, the people of Gau Island are predominantly involved in subsistence activities but are being lured to adopt commercial agriculture, timber milling, deforestation, alteration of coastal habitats. In addition, changes in the villages are resulting in coastal pollution and destructive fishing that can threaten the living conditions people face. The proposed project will allow the villagers to plan and undertake social and economic activities that are holistic in their outlook and consistent with known sustainable development practices.

The Gau Island Council in a meeting in 2001, agreed to manage the native forests and habitats of the endemic bird Kacaunigau. (Fiji Petrel *Pseudobulweria macgillivrayi*). In a workshop in 2005, they agreed to work with Dr Joeli Veitayaki to articulate integrated rural development in all of their villages and settlements.

The villagers in the Tikina Vanuaso and others in the island have been working closely with the University of the South Pacific (USP) and the International Ocean Institute-Pacific Islands (IOI-PI) in a pioneer project to undertake training and action on resources management and rural development. The IOI-PI has been supporting alternative sources of livelihood in coastal communities, which are now set up in all the villages and settlements.

The Rehabilitation of Coastal Habitats in Vanuaso Tikina in Gau in 2003 was funded from the National Fish and Wildlife Foundation over two years. This initiative has trialled the approach that is now proposed for Gau Island. The results in the Tikina Vanuaso have been particularly encouraging and have diffused into other areas and are some of the reasons for the extension in project area proposed here.

Follow up activities have continued in Gau through the generous support of JICA, IOI-PI and USP. Workshops and regular meetings continue by Lomani Gau members. In these meetings, ideas on rural development options are shared and discussed. For example, JICA installed 7 inshore fish aggregation devices to assist villagers that have distant reefs. The villagers are monitoring the catches from the FADs.

Marine survey has begun with Frontier-Fiji taking the lead. In partnership with Lomani Gau, Frontier-Fiji is conducting the marine ecological surveys and are conducting workshops in some of the villages. Some initiatives include Turtle Conservation and the discussion of the main threats to marine life in the different villages.

The people are very supportive of the resource management activities once they are convinced that they are for their benefit. Useful lessons have been shared in the publications that have been made on the subject.

At the JICA sponsored Fisheries Management workshop in the island in November 2005, the Lomani Gau Committee was established after the representatives from Sawaieke and Navukailagi Tikina mentioned that they wanted the Mositi Vanuaso approach extended to include them. The association with IOI-PI was agreed at the meeting and has been on going since 2005. The first joint activity of Lomani Gau and IOI-PI is the competition for the most beautiful village which is now adopted as a yearly activity. Lomani Gau currently hosts the UK-based Frontier-Fiji, which is conducting marine resource surveys in the island.

Each village has identified the alternative source of livelihood and development activities it chooses to pursue. These activities are part of the plans that each village has formulated. A copy of the plans are attached in this proposal as part of activities that the Lomani Gau Committee can pursue as part of this project.

People in rural areas like Gau Island are faced with development challenges that they need to adequately and appropriately address. This is crucial because unless these people, who are making difficult resource use decisions everyday, are aware of what is best for them in the long term and are well versed with the development challenges they face, they are likely to lose their heritage because they are ill advised and misled by their outside development oriented partners.

This multifocal (incorporating biodiversity and international waters) project makes integrated resource management and enhanced community livelihood the focus of rural development. Sustainable rural development must be made part and parcel of the development activities that the people undertake. The project will promote the message that the care of environmental resources should be undertaken because it makes economic, social and cultural sense.

This project should also allow people to adopt integrated resource management when making decisions regarding their natural resources. All the villages in Gau Island now manage their marine resources. They now should be looking landward to the management of their other resources and environment. This process will be accompanied by workshops, training and follow up activities.

The Ecosystem Based Management team supporting communities of Kubulau and Macuata are striving to preserve the health of the marine ecosystems or 'seascapes'. EBM is a holistic integrated management approach and therefore also includes adjacent systems such as terrestrial, freshwater and mangrove. It is anticipated that over time the lessons learnt from Kubulau and Macuata will be shared throughout Fiji and the Pacific region. The project vision for EBM Fiji is: "Healthy People, Processes and Systems" (EBM Kubulau Bulletin Editor 2008 (3)).

The EBM study has identified several Fijian watersheds which are particularly important to protect and restore forest cover in order to protect healthy ecosystems and fisheries on high conservation value reefs. The study highlights those watersheds that have a high propensity for major erosion due to their biophysical conditions (for example, soil, rainfall, slope, level of development) and which are adjacent to priority reefs identified as highest priority by Fiji's National Biodiversity Strategy and Action Plan. These critical watersheds that are adjacent to high priority reefs are either still well-forested and require adequate protection and those that are largely modified but need restoration (Atherton 2005:i).

The critical watersheds important for reef conservation include those located along the southeastern coast of Bua and the western and north-central coast of Macuata in Vanua Levu. These watersheds should be well-managed in order to sustain local fisheries (freshwater and marine), maintain clean water, and reduce flood damage. However, this particular subset can greatly impact the health of priority reefs for conservation due to their high erosion potential and adjacency to the reefs. For this reason, their natural forests deserve extra effort for protection or restoration (Atherton et al. 2005:i)

The subsistence fisheries for local communities are particularly threatened by logging. Overfishing has a major influence on the quality and quantity of these fisheries, but nutrient-loading and sedimentation from degraded watersheds has an equal, and perhaps more long-term, impact on coastal ecosystems. The majority of coastal marine ecosystems and local fisheries are directly adjacent to coastal watersheds. Sediment plumes from larger rivers influence only a small portion of Fiji's reefs, and some of these reef communities are adapted to intrusions of freshwater and periodic, high sediment-loads (Atherton et al. 2005:22-23). Logging causes persistent high sediment loads, particularly in higher rainfall areas, for up to a decade afterwards (Atherton et al. 2005: 22-23).

EBM is an integrated effort addressing both land and seabased threats and uses offers resource managers the optimum approach for sustaining natural resources and the Fiji EBM team continues to support the KRMC to adopt EBM principles to holistically manage Kubulau's natural resources (EBM Kubulau Bulletin Editor 2008 (3)).

Kubulau Tikina consisting of Nadivakarua, Natokalau, Kiobo, Namalata, Navatu, Raviravi, Naisasaivua and Waisa villages, is part of the Ecosystem Based Management (EBM) project in Fiji. Working in collaboration with the World Conservation Society, WWF and other partners, the people of Kubulau are trying to manage their ecosystem that support them through the provision of ecological services.

Visiting Kubulau was crucial because of the unique resource conservation experience that the people have. Apart from being one of the few areas where EBM is practiced, Kubulau has extensive and rich fishing grounds that are relatively isolated and presumably more protected from fishing, has a hotel that provides welcomed support to the MMA, is involved in logging, commercial fishing and agriculture. It is fascinating to see how the

people of Kubulau use their resources and keep up with resource management that the people have undertaken.

Most of the people are aware of the resource management arrangements within the Tikina and the benefits already witnessed. These people are also aware of the impoverished state of the fishing grounds and the activities undertaken to address this.

Two types of MMAs were observed in Kubulau; the three that were observed by the Tikina and those for the yavusa in the different villagers. The Tikina MMAs include the Namena MPA, Namuri and Nasue, which were permanently closed. The MMAs declared by the different villagers were periodically opened to meet the villagers' needs.

On Macuata, the EBM approach studied the socio-economic factors affecting natural resources, and provides baseline conditions, founded on what was observed and information gathered in the districts of Mali, Dreketi, Sasa, and Macuata in 2006. The people of these districts collectively are traditional custodians of the inshore area, extending from the coastline to the outer edge of the barrier reef. The seaward boundary of the reef system is known as "*Cakaulevu*" or the "*Bainivualiku*", meaning the Great Sea Reef or the 'North Wall'. In total the fishing area covers 2064 km², which includes both inshore and certain off shore habitats.

Population dynamics showed the increase in the number of people per household, village, and tikina over a 10 year period. Furthermore, the population structures of the studied area indicate a high concentration in lower age classes of 19 years and below. This structure implies that the population for the study site will increase when this youthful population reaches child bearing ages. With the current high level of school drop outs, the pressure on the natural resources within the area will continue to mount, particularly as a less educated population is less likely to fully appreciate the need for sustainable management, and how to put it into practice (WWF 2006).

At the moment, communities in the study area rely on marine and terrestrial resources as the main source of income. Communities that are closer to the urban centre in Labasa registered more economic activities such as paid skilled and unskilled employment. Community income and spending patterns indicated poor management of finance. All households in the 4 *tikina* obtained their income from either the harvest of resources from the land and or sea, which provided 75% of all household income. This pattern together with the youthful population will inevitably see the continuous and increasing levels of exploitation of these resources in the surrounding areas and the associated degradation of the natural habitats. Managing household finance is therefore essential in attaining long term sustainable resource use.

The type of agricultural and fishing activities that members of the households engage in varied between coastal and inland communities. Inland communities concentrated largely on forestry, *yaqona* farming and freshwater fishing, whilst the coastal communities concentrated on cash crop farming, sugarcane farming and marine fisheries. The

economic return for each category of income is influenced by the availability of markets and infrastructure.

This survey also collected the conservation knowledge and practices known to the people in the surveyed sites. It outlined the fishing patterns and activities that communities use within their *Qoliqoli*. Waste disposal is covered in brief as it impacts upon the environment that communities are surrounded by and depend on for their general well being. Although, waste is not collected regularly like in the urban areas, its proper disposal is vital in attaining resource conservation and sustainability. Health issues are highlighted by the common illness in households. Their initial remedies are also listed, including both traditional and medical treatments. The knowledge of traditional medicines in the four districts, calls for conservation effort to protect the resources used or needed. The socioeconomic aspects need to be carefully addressed so as not to undermine the community's reliance on their natural resources for their livelihoods. The socio economic features and requirements should be transformed to activities and strategies, to be implemented, and managed as indivisible parts of the ecosystem based approach to natural resource management and sustainability (WWF 2006).

Navakavu MMA is located on Fiji's main island of Viti Levu about a half hour drive from the capital city of Suva. Navakavu was established in 2002 with support from the Institute of Applied Science of the University of the South Pacific and the Fiji Locally Managed Marine Areas Network. It is a community-based marine protected area supported by the national government's legal framework for "customary fishing rights areas" within the Fiji Fisheries Act. Approximately 600 people live in the area around the MPA.

Navakavu is a yavusa (a traditionally linked unit or clan) and consists of three villages and two settlements: Muaivusu, Nabaka, Waiqanake, Namakala, and Ucuinamono. The key stakeholders in the MPA are the local villagers including fishers in the communities and the local clan chief. Fishing is the number one source of income for the communities followed by agriculture. The MPA itself has mangroves, mudflats, seagrass beds, blue holes, as well as fringing and submerged coral reefs.

Whilst there is strong support for the LMMA, there are some people that say that the length of the closure of this marine area has gone on now for too long, and that there should be periods when the MPA should be opened again. Others (most of the people we spoke with), having observed the changes that the MPA has brought about, feel that it's best to have the closed area forever particularly as the MPA carrying capacity would not be able to cater for the increasing population within the communities if it is opened again (van Beukering 2005).

It is also noticeable to community members the spillover effect of the closure of the LMMA: "There are more octopus outside the MPA, which was an unlikely possible case a decade ago".

Community members also mentioned a number of times that the LMMA has brought researchers from within Fiji and around the world, which helps promote the MPA effort of their community and especially Fiji as a whole. This makes them proud of their initiative. Because of the LMMA there are now fish wardens, four in total – one from each of the larger villages. However, it is difficult for the fish wardens to effectively do their assigned job, and this is closely linked to lack of resources and lack of effective coordination within the community which otherwise would have enabled them to carry out their assignments more effectively. For instance, one boat is not enough to patrol the MPA. Also, the patrol boat is looked after by each of the four fish warden in a 3-month rotation, and the boat is frequently used by the fish warden for income generating activities such as fishing and boat hiring. Poaching by community members and outsiders still takes place (van Beukering 2005:10).

The maintenance of this LMMA, which is very close to Suva City, is not without some additional problems as many community members identified the following: general waste, plastic bags, rusted debris and oil slicks from shipwrecks make their way to the MPA; the waste disposal of factories is poor and also makes their way to the MPA; and oil spills (e.g., many dead corals are observed along a passage where such waste most often passes through). Moreover, ballast water from international vessels (and other nutrient sources from the city) is thought to travel all the way to the fishing grounds and lead to nutrient enrichment, promote the growth of seaweeds, and the extra nutrients also contribute to the growth of *Sargassum* sp (van Beukering 2005: 10).

Verata in Tailevu is the birthplace of community based resource management in Fiji. The villagers have been involved in training activities, meetings and other follow up resource management activities. Today, three Managed Marine Areas (MMA) have been agreed upon as reserves (tabu areas) by the chiefs and people of Ucunivanua village. The MMA's are Lomo which began in 1997, Cakaunikaikoso in 2005 and most recently Matanaiverata in 2007.

Ucunivanua is the chiefly village of the Tikina of Verata, which comprises 8 villages (Ucunivanua, Naivuruvuru, Kumi, Navunimono, Naloto, Sawa, Uluiloli and Naigani). The population of Ucunivanua is approximately 500 with youth making up over around 30 percent of the people.

The people of Ucunivanua and Verata have seen and experienced the value and benefits that came their way since the beginning of these MMA's. Not only were tremendous increases in the "kaikoso" (the marine species under study) both in size and population realized, but also increases in other marine species were evident. The increases were noticed in adjacent reefs as well. This goes without saying that the success already stated above did not have its leadership and management issues. A major issue is poaching by the villagers themselves especially women and might be others from outside. Additionally, and most importantly, no particular chief (as there are several chiefs) has been chosen for the village to be responsible for authorizing fishing in these MMA's. There is also no set of rules in place that stipulates reason(s) for anyone that may fish in the MMA's concerned.

The marine conservation area of ‘Ulunikoro’ in Ono in Kadavu is currently the sole MPA gazetted in Fiji. It extends from the south to south east coastline of the island to the coral reef some 2kms. away and cover an approximate area of 18.27sq. kms (marine reserve = 0.84 sq km). Ulunikoro is part of the Great Astrolabe Reef.

The seven Ono villages of Waisomo, Vabea, Narikoso, Nabouwalu, Naqara, Vabea and Dravuni and are collectively referred to as vanua Ono. Vanua Ono (total population of 700), is a collection of related groups of people and their resources bounded by amongst other things traditional customs of resource use.

The declaration of Ulunikoro MPA began after Mikaele Turaga, headman of Waisomo village, attended a marine awareness workshop in Tavuki in Kadavu in 1996 conducted by the University of the South Pacific’s (USP) Marine Studies Programme (MSP). Mr Turaga was moved to seek advise and assistance on the establishment of a marine conservation area in his community. He continued with community discussions and then approached MSP for assistance in developing a project document. USP advised Mr Turaga to contact WWF and Fisheries in mid 1997, which developed into the partnership it is today (WWF).

The Ulunikoro Marine Conservation Area is now gazetted under the Fisheries legislation. Further monitoring and evaluation is required to determine the effectiveness of community-based marine reserves and management as a conservation tool to protect, conserve and sustainably manage marine resources in the South Pacific. WWF is assisting Waisomo villagers and interested villagers from other villages through facilitation of resource assessment, planning and development of management regimes for the Ulunikoro Conservation areas.

The community has set up a number of measures to ensure the long-term sustainability of their marine resources and has observed an increase in fish catches other areas of their i qoliqoli.

VII) Changes Accompanying the Establishment of Marine Reserves

Belize

For Belize, None of the four communities report significant impacts from the establishment of the Laughing Bird or Gladden Spit MMAs. This is largely due to the multiplicity of fishing sites within Belizean waters, the general lack of territoriality that allows flexibility in where to fish, and the ability to “fish the line” just outside of the closed areas. Most fishers commented, however, on the negative cumulative effect of the establishment of so many MMAs in Belize waters. All commented on the importance of the ‘multiple-use’ aspect of Gladden Spit, in particular the allowing of fishing on the smaller spawning aggregation, although there is also some feeling that this is not a good conservation practice.

This is not to say that there have been no cultural impacts from the creation of MMAs in Belize. The loss of traditional fishing areas, especially when this involved seasonal family activities such as migration from the mainland to the cayes, or from one caye to another, has had some degenerating effect of cultural continuity of most if not all coastal populations. However, this degeneration has occurred in the context of significant cultural changes due to other factors such as coastal development, in- and out-migration, and other social and economic issues within the communities.

Brazil

In Brazil, the effects of the establishment of MMAs is correlated with the characteristics of the MMA itself. For example, the Abrolhos Bank MMA was established as a no-take zone, with an emphasis on resource protection and leisure-tourism uses. Much of the fishing area of the Abrolhos Bank is fairly far offshore, and therefore has had less effect on small-scale fisheries. For the Corumbau Extractive Reserve, however, the main effects have been allocative from migratory fishermen to local fishermen. This was the intent of the extractive reserve concept – to allocate the benefits of the resource to local users. Therefore, whatever effects occurred took place among populations of fisher that are widely dispersed along the Brazilian coast and those in the neighbor fishermen communities of Prado. This might also be the case of the newly instated Cassuruba Reserve and the fishermen from Alcobaca and from the northern communities of Espirito Santo.

In the case of Extractive Reserves, with the exclusive use rights' concession for the land or maritime territory, local communities are suddenly (and formally) empowered, and given a number of management responsibilities for which they are in general not prepared. Limited back-up to overcome the lack (or weakness) of local resource-governing institutions and the several social and legal barriers to collective action also add to the challenge of implementing a MER.

Fiji

In Fiji, it is important to understand that Fijians have practiced a form of MMA for thousands of years – the *qoliqoli*. This indigenous system had in part broken down because of the British Colonial influence, which was characterized by the attempt to centralize fishing policy and management in a central civil national government. This attempt to centralize was never completely successful, and resulted in a two-part system where local *qoliqoli* managers essentially had to approve a fisherman prior to their receiving the civil government license. One of the primary effects of the re-emphasis on MMAs, in particular the local control aspect, has been to revitalize the *qoliqoli* concept under the rubric of MMAs. This appears to have had benefit for resource conservation and the revitalization of local traditions of allocation and participation in the management process. In some cases, the emphasis on “modern” MMAs appears to have stifled innovation in fishing methods by local fishermen.

Panama

The Coiba Island situation is relatively unique among the four MMAS nodes, due to the history of the island as a penal colony until very recently, and to the offshore distance of the island from the mainland. Not all fishermen based in the Gulf of Chiriqui had boats and resources that would allow them to fish so far offshore, and those who did were restricted by the 10 KM federal protection zone surrounding the island to protect the prisoners. This had resulted in the area around Coiba being “protected” from fishing for most of the 20th century. When the Coiba Marine Managed Area was created, only 147 (?) fishermen were on record as having fished in the Zone; of those only 47 now have active licenses; and those 47 are spread among several communities around the Gulf of Chiriqui. Therefore, the cultural impact of the establishment of the Marine Managed Area are difficult to detect.

VIII) Other Forces affecting the People and Communities

Belize

For Belize, All four communities have been affected significantly by:

- 1) The development of the leisure-tourism industry;
- 2) by the development (or lack) of infrastructure such as roads;
- 3) by the trends in labor alternatives such as timber and fruit; and
- 4) by in-migration from neighboring countries.

Fishers from all four communities state that they see the value in MMAs, although they would like to be more included in the decision-making and management process and often differ in how to manage the increased resource provided by the MMAs. Where the community has been involved in the establishment of MMAs, as in Placencia, that involvement is seen as diminishing over time.

Brazil

There are several forces affecting the fishermen communities for the Abrolhos Bank:

1. The development of the leisure-tourism industry;
2. Real state speculation and the consequent moment of fishermen households inland, far from the beach and from their boats;
3. Public policies aimed to industrial fishing and aquiculture, resulting in growth of these sector and difficulties in the commercialization process, generating lower prices for small scale fishing;
4. Distance of the communities, resulting in expensive oil prices;
5. The growth of eucalyptus plantation in the surrounding areas, resulting in changes on the small rivers and access that are used by the fishermen as shelter.

Fiji

MMA's are spreading rapidly in Fiji and other countries in the Asia-Pacific region as local communities are protecting their marine resources that are in danger of depletion and overexploitation. These communities use their customary practices the basis of their community-based resource management activities and create the need to better understand the influence of the cultural roles on the effectiveness of MMA's and how the challenges faced can be addressed.

The commitment to manage marine resources in the local communities is demonstrated by the fact that even though the Fiji Government had proposed in an international forum to have 30 per cent of all its national waters managed by 2020, nearly all of the management activities taken up to now have been by local communities using their customary rights. In these communities, the people have made the hard decision to restrict, reduce and manage their coastal resources for them today and their future generations in years to come. The challenge is to support these initiatives to effectively conserve the resources to benefit the resource owners, users as well as the environment.

Panama

The Gulf of Chiriqui is a rapidly changing area due in particular to leisure-tourism development. Many if not most of the fishermen in the coastal communities also work in the general construction trades, which has been variable but steadily growing due to the growth in the leisure-tourism market.

IX) The Fate of Traditional Populations, Communities, Cultures and Cultural Activities

Fiji

The relationship between people and their natural resources in Fiji as in the Pacific Islands demonstrate the care that people have for each other, future generations as well as the environment (Govan 2009:22). In these areas, community-based resource management is a dynamic system of social interventions, shaped by local practices and influenced by a combination of internal and external events. People are aware that their resources recover quickly if their use is reduced and have developed practices to restrict their effort whenever this is justified. To make contemporary community-based marine resources management more effective, the motives, ethics, interests, and cultural conceptions of the people involved are assessed and evaluated to see how their knowledge, education, belief, community dynamics and perceptions influence their resource management activities.

In Fiji and many Pacific Islands countries, a customary marine tenure system based on local autonomy and self-reliance, control the use of local marine space and resources. While this tenure system is recognized in national constitutions and legislation in Papua

New Guinea, Solomon Islands, Samoa and Vanuatu, it is only an informal right in Fiji, where there are 410 registered customary fishing rights areas (*qoliqoli*), which support subsistence fishers as well as some commercial interests. In the heavily exploited *qoliqoli*, around Fiji, resource management is important as local pressure is no longer sustainable (Muehlig-Hofmann 2008).

In many traditional villages, the respect for chiefs, which depends on factors such as their strength of character, knowledge and authority (Vunisea 2002), is increasingly questioned. This is important to note because the declaration of MMAs is determined by the social structures and the circumstances in the local communities involved. In communities where there is strong, wise and respected leadership (Muehlig-Hofmann 2008), the customary system offers an alternative to contemporary, government instigated resource management. In these communities, people take resource management action because they believe in its implementation instead of waiting for government directive, guidance and leadership.

X) Important Emergent Themes

Belize

For Belize, the important emerging themes are these:

Theme 1 – The overwhelming effect of general economic development and social change in the coastal area of Belize, specifically the development of the leisure-tourism society and economy.

It is essentially difficult to see the effects of specific MMAs on coastal communities and people in Belize independent of the general and overwhelming effects of broader social, cultural and economic change. Although specific effects can be pinpointed, they pale in comparison to the effects of these broader changes. In that some of these broader effects, in particular leisure-tourism development, can be traced to the establishment of MMAs overall and the value of MMAs to the leisure-tourism industry, all of these effects are linked together.

Theme 2 – Multi-Ethnicity.

The mix of ethnicities in the Belizean coastal zone – Creole, Garifuna, Maya, and Mestizo in particular – characterize and define the cultural involvement with and effects from MMAs in our research communities. A great portion of the cultural effect of MMAs in the researcher communities is circumscribed by the role of kinship, community and ethnicity.

Theme 3 – The Belizean history of colonialism and merchantilism.

The history of Belize as a British Colony and the associated merchantilist economy, wherein raw goods and natural products are shipped out of the country and processed and more expensive goods are shipped in, thereby creating a cycle of negative domestic economies and dependence, defined and still defines the character of Belizean economics, including fishing. The link with the ‘big international non-government organizations (BINGOs)’ is interesting here – is this the new merchantilism, ‘exporting’ the gross benefits of the use of the marine environment to the leisure-tourism industry and creating low-paying, dependent jobs for local communities? To the extent that local communities are involved in independent business enterprise or skilled job in association with the leisure-tourism industry, this effect may be ameliorated.

Theme 4 – The relative powerlessness of coastal peoples.

A documented world-wide phenomenon is the relative powerlessness of coastal – in particular fishing – communities because of the physical hazards, low levels and uncertainty of income, and under-representation in the political process. This is generally true of Belizean coastal communities, in particular in the face of powerful economic and political forces such as leisure-tourism and the power of BINGOs .

Theme 5 -- Populism, nationalism and environmentalism.

The beginning of the environmental movement in Belize was characterized by a coming together of popular, nationalistic, and environmental movements. This has defined the outcomes in such arenas as marine resource management. The question is the mix of the three into the future.

Theme 6 -- Lots of water, lots of reef, small human population.

One of the reasons that the effect of individual MMAs is difficult to detect is the large availability of fishing space relative to the fishing population. This is probably the reason that formally territoriality is not very much in evidence among fishermen in Belize, and that there has not been more protest over the creation of each individual MMA – there has always been somewhere else to fish. This circumstance changes as more MMAs are created (see Theme 7).

Theme 6 -- Initial lack of involvement and communication difficulties between local communities and MMA process.

Although attempts have been made to include all stakeholders and local communities in the MMA establishment process – of particular note is the history of Friends of Nature with Laughing Bird Caye and Gladden Spit – those attempts have been uneven among MMAs and, where the communication and involvement has been full in the beginning, has tended to diminish over time.

Theme 7 – Connections among, and cumulative effect of, MMAs.

Although the effect of each individual MMA on commercial and subsistence fishers may be small, the cumulative effect of increasing number of MMAs in Belizean waters is large. In general, there does not appear to be any specific overall plan for the siting or function of these MMAs as a group, nor any account taken of the cumulative impact on commercial or subsistence fishers or the opportunity for both more effective conservation (i.e., corridors) or economic and social (i.e., designated areas where commercial or subsistence fishers CAN fish) stability through such planning.

Theme 8 -- The role of general fisheries management.

Many topics related to general fisheries management such as

- 1) The need for a robust fishing license system;
- 2) adequate data collection programs;
- 3) effective monitoring and enforcement;
- 4) the full use of Traditional Ecological Knowledge in “modern” management;
- 5) consideration of features such as designated fishing areas tied with local communities;

do not seem to have been fully considered in the rush to establish MMAs.

Brazil

For Brazil, the important emerging themes are these:

Theme 1 – The Role of Political and Administrative Organization

Since MMAS are regulated and administered by the State, public policies for those areas are influenced by the political party that is predominant. In the last eight years, PT (the Labor Party) was in office and many policies directed to the eradication of poverty, development of communities infrastructure, empowerment of traditional population were stated. If, in the next election, another party comes to office, there might be major changes in the Environment Policies.

Theme 2 – The role of BINGOs

Although question of influences from outside of the country certainly arise, the fact that certain BINGOs had established office in Brazil in Bahia Province was critical in producing much of the scientific and political work necessary to the establishment of MMAs. This work included science and activism with respect to such activities as offshore oil and gas development and aqua- and mariculture.

Theme 3 – The Critical Role of Local Community Organization

The involvement of local community organizations is critical in the establishment and management of an Extractive Reserve. In the case of Corumbau Reserve, after 10 years

there are some development in the Community Organization. The Management Plan is almost done and the community have decided who are the beneficiaries of the area. In Cassuruba, the significant differences between the communities point to future of conflicts and negotiation in the process of community empowerment.

Fiji

For Fiji, the important emerging themes are these:

Theme 1 – The critical role on local village culture and tradition

The traditional cultural understandings and relationship in Fijian society form the basis for current resource management practices. Attempts to weaken or circumvent these traditional understandings and relationships have led to failure of management initiatives.

Theme 2 – Local Resource owners must be supported by the national government

Although traditional Fiji customs and practices can form the basis for effective MMA management, those customs and practices must be backed up and supported by national civil law. This is in part due to the increasingly diverse nature of the Fijian population, which is reflected in such activities as migratory fishing by non-indigenous fishermen.

Theme 3 – Attention to the role of BINGOS (big international non-government organizations, i.e. CI, WWF, TNC) in local MMA policy and management

Around the world, but in particular in Fiji, many BINGOS have become involved in the MMA movement. Partly in response to this FLMMA (the Fiji Local marine Managed Area network) was created, and has acted as a very effective local coordinating body for MMA activities in Fiji, combining effective local control with significant progress.

Theme 4 – The problem of effective monitoring and enforcement

Whether it is in one isolated MMA/*qoliqoli* by neighboring villagers or across Fiji by migratory fishermen, poaching is a serious problem. Part of this may be solved through more fully developed local relationships, but part will have to be addressed through country-wide civil government action.

Panama

For Panama, the important emerging themes are these:

Theme 1 – The Role of Larger Processes and Events

The fact that Coiba Island had been a well-protected penal colony since the early 20th century was critical in the establishment of the MMA. When the decision to close the penal colony was made, there was significant conflict, from the local to the national level,

with respect to the future use of the island and the surrounding marine environment. Ultimately, the decision was made to create the MMA with the significant involvement of a broad-based MMA Advisory Council.

Theme 2 – The Involvement of BINGOs

As in many of the other nodes, BINGOs have had significant involvement in the development and management of the Coiba MMA. In the case of Coiba, this extends to the provision of on-going research, monitoring and enforcement activities and resources.

Theme 3 – The Role of Physical Distance and Isolation

The fact that Coiba Island lies dozens of kilometers offshore, in addition to its history as a penal colony, contributed to the relative lack of use of the marine area that eventually became the MMA.

Theme 4 – The Role of Larger Social and Economic Forces

The fact that the land side of Gulf of Chiriqui is undergoing significant change and development in general, apart from the management of marine resources, is significant in the lives of the communities that are located on and use the Gulf, including the MMA. Job opportunities in the construction industry, for example, highlight the role of other occupations as alternatives to commercial fishing.

XI) Summary Across Nodes for Cultural Roles

- A) Theme 1 – The Critical Role of Cultural Belief, Attitudes and Practices
- B) Theme 2 – The Role of Contextual Factors in Social and Cultural Process (for example, the general shift to leisure-tourism in coastal economies, labor migration in or out of the coastal communities, the availability of alternative occupations)
- C) Theme 3 – The Potential for Support for or of Revitalization of Coastal Communities Through the Creation of MMAs
- D) Theme 4 -- The Potential for Disruption of Social and Cultural Systems Through the Creation of MMAs
- E) Theme 5 – The Importance of Broad Local Stakeholder Involvement in All Parts of the MMA Development and Implementation Process