

Assessment of socioeconomic conditions at Placencia, Hopkins and Monkey River in Belize

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1 EXECUTIVE SUMMARY

The purpose of this socioeconomic assessment is to provide baseline data on the social and economic conditions of three of the five coastal fishing communities supporting Friends of Nature (FON) in the co-management of two marine reserves in southern Belize. FON is a non-governmental, membership organization, based in Placencia, Belize. Fishermen, tour guides and business people form FON's Board of Directors. Originally known as Friends of Laughing Bird Caye, the organisation lobbied the Government of Belize to declare Laughing Bird Caye, which had been used historically as a fishing camp, as a National Park and to protect biodiversity and promote the sustainability of the natural resources off the coast of Placencia. FON also has a co-management agreement with the Fisheries Department for the management of Gladden Spit Marine Reserve. Gladden Spit is one of the very few spawning aggregation sites in Belize and this is where whale sharks also make appearance in the months of April, May and June as part of their migration route.

This assessment was carried out from July to September 2003 in Placencia, Hopkins and Monkey River. The data were collected through interviews carried out in the three communities using a household questionnaire. The results show that all three communities depend on fishing and tourism based activities as sources of income. Though being fishing communities, no more than 50% of the people interviewed in each community knew about the rules related to the coast. With their own community threats and community problems, Placencia seems to be benefiting more financially than the other two communities. This can be noted from their responses and from their material lifestyle. All three communities are aware that both the government and the people should work together to solve problems in the fishery. Some fishermen however have great concerns about the government taking away their fishing grounds for protection. Other community members are more worried about tourist development in the community by foreign investors. All three communities are aware to an extent of the work being done by FON but recommend more consultation, and are willing to participate in decision-making by FON. FON has initiated a strong foundation through consultation, and education about the importance of natural resources in these communities. With more community awareness, the goal of co-management can be achieved.

2 INTRODUCTION

A socioeconomic assessment is a study to learn about the social, cultural, economic and political conditions of individuals, groups, communities and organizations. Socioeconomic monitoring should be conducted over a period, usually at set intervals. (Bunce et al, 2000).

This socioeconomic assessment is one activity under the Coastal Resources Co-management Project (CORECOMP) being implemented in Barbados, Nicaragua and Belize by the Centre for Resource Management and Environmental Studies (CERMES) with funding from the Oak Foundation. The goal of CORECOMP is to promote sustainable development of fisheries and other coastal resources and to ensure food security and livelihoods for those who depend upon these resources in the Central American and Caribbean region through improved fisheries governance and management (McConney and Pomeroy, 2002).

The purpose of this socioeconomic assessment is to provide baseline data on the social and economic conditions of three of the five coastal fishing communities supporting Friends of Nature (FON) in the co-management of two marine reserves in southern Belize. This assessment will also provide a basis for a regional system by which site-level data can feed into national, regional and international databases for comparison. It was conducted as an internship with CORECOMP, for the duration of which I was assigned to FON in Belize.

In this section Pomeroy and Goetze (2003) provide the description of FON and the study area. Friends of Nature is a non-governmental, membership organization, based in Placencia, Belize. FON was formed by a small coalition of dive guides, fishermen, tour guides and business people in response to the threat of tourism development in the area. The organization came together to lobby government to declare Laughing Bird Caye, which had been used historically as a fishing camp, as a National Park and to protect biodiversity and promote the sustainability of the natural resources off the coast of Placencia. FON now co-manages with the Forestry and Fisheries Departments, Laughing Bird Caye National Park and Gladden Spit/Silk Cayes Marine Reserve respectively, and has also become active in the co-management of the Placencia lagoon. The study area includes three fishing communities in southern Belize: Placencia, Hopkins and Monkey River (Figure 2.1).

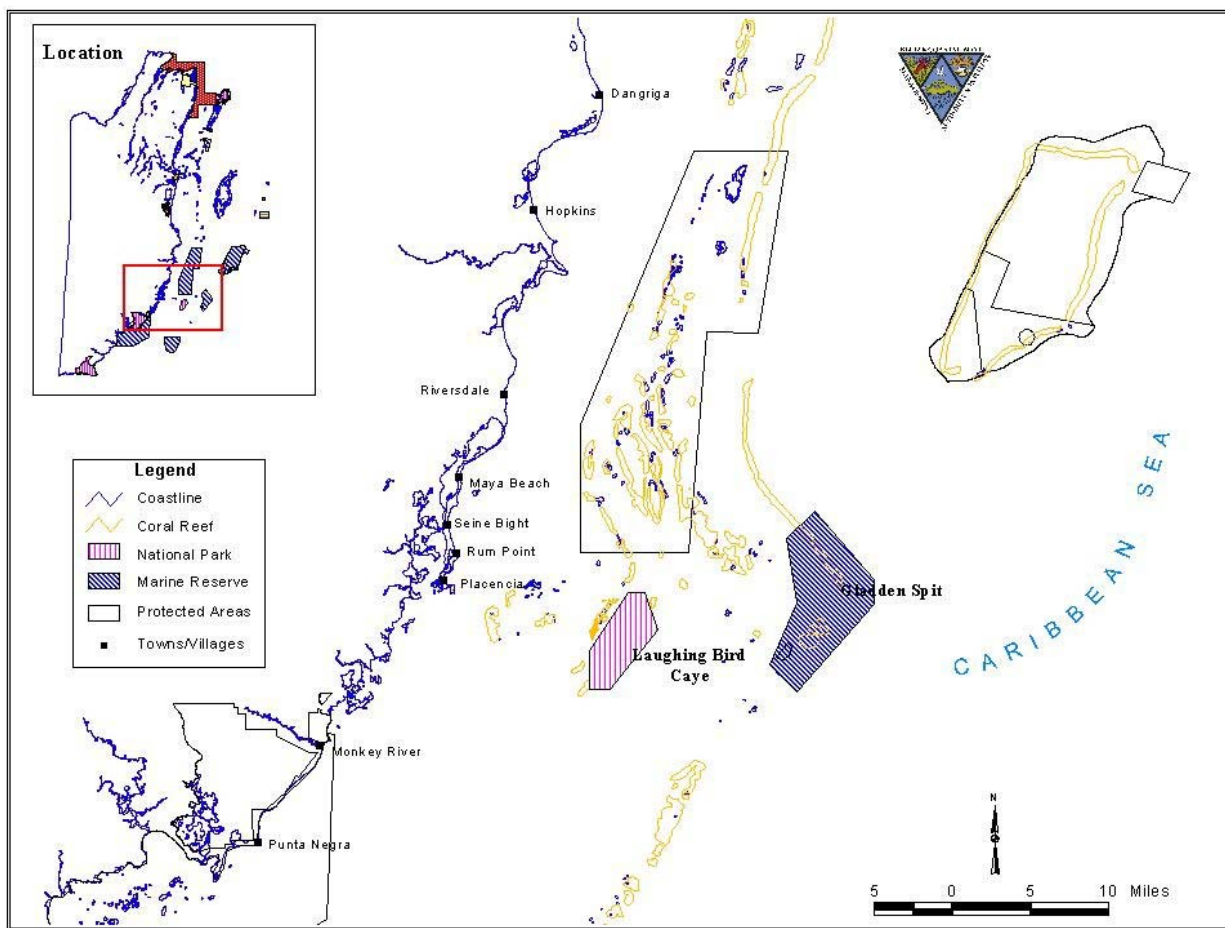


Figure 2.1 Map showing Placencia, Hopkins, Monkey River, Laughing Bird Caye National Park and Gladden Spit Marine Reserve
 (Source: coastal Zone Management Authority and Institute)

Coastal Southern Belize can generally be described as a series of low-relief land types, characterized by the presence of swamps, lagoons, estuaries, mangroves, littoral forests, beaches, the barrier reef, cayes and atolls. The coastal marine environment is characterized by the presence of seagrass beds, hundreds of sand and mangrove cayes, and the barrier reef, which extends 230 km and runs parallel to the coastline from the border with Mexico in the north to the Sapodilla Cayes south, almost to the border of Guatemala. Approximately 1,061 sand and mangrove cayes are distributed along Belize's coast and are associated with three atolls lying east on the main reef system.

Laughing Bird Caye and Gladden Spit occupy part of the southern reef complex, which extends at its greatest width (between Placencia Caye and Gladden Spit) for about 25 miles and, taking the Barrier Reef as the eastern limit, covers an estimated total of 90,400 acres of sea and cayes. It consists of approximately 75 cayes, mostly no larger than one or two acres. The region can be viewed as comprising three sections:

- the 'barrier reef cayes', characterized by cayes such as Gladden, Buttonwood, Hatchet, Little Water, Pompion and Silk Cayes;
- the 'inner reef cayes', including the Pelican Cayes, Quamino, Tarpon, Bakers, Rendezvous, Lark, Moho, and Laughing Bird Caye;
- the 'shoreline cayes', such as False, Placencia, Palmetto, Rocky Point and Great Monkey.

There are few obvious indicators of sea level rise; it is reported that several sand bars and shoals have become more pronounced in recent years. Hurricanes seem to be a major determining factor in alterations to the physical characteristics of the cayes, especially the barrier reef cayes. Considerable erosion is reported on the mainland, along the Placencia peninsula (which could be at least partially caused by alteration and development on the shoreline).

Depths between Belize City and Punta Gorda range from 10-30 m with salinities between 28-32 ppt. Salinity patterns vary seasonally due to flooding of rivers resulting in heavy outflows of freshwater on to the coast. Currents tend to flow N-NE outside of the main barrier reef, and S-SE near the coast behind the main reef system. Climatic conditions on the southern coastal plains of Belize can be quite variable from one location to another. The rainy season is from May to January and the dry season occurs from February to May, with a hurricane season from June to November. Average rainfall is 2,500 mm per year.

The mangrove communities in the area include black mangrove, over 30 m tall, and provide habitat for a large diversity of insects and birds. Five types of seagrass have been identified along the coast. There is a variety of wildlife in the area. There are numerous cayes noted as bird nesting sites, particularly for pelicans and frigates, though some ospreys nesting and egrets have been reported. Hawksbill, loggerhead and leatherback turtles have been reported to nest on the cayes. Manatees are sighted around Pelican Cayes and the Lark Range, although the greatest concentration is in and around the mainland lagoons (Placencia and Indian Hill).

Out of the approximately 75 cayes in the Placencia region, 84% are identified as National Lands and 16% as private property. Forty-one percent are nationally owned cayes with leases to cover all or part of them and 43% have no identifiable leases on them (this includes Laughing Bird Caye, North and South Silk Cayes, and Little Monkey Caye). In July 2001, there were approximately 39 approved leases on 29 of the cayes. Previously, leases were approved for up to 30 years, however over the last few years, leases are approved in the first instance for only 7 years; following development compliance or request for lease fiat, an individual may receive approval from the Lands Department for extensions of between 20 to 30 years. There is some concern among local residents at the rate at which cayes are being privatized.

Many of the cayes are semi-permanently inhabited and some intermittently occupied, mainly as fish camps during various fishing seasons. The small number of cayes used for purely residential purposes are mainly privately owned. Growing tourism activity in the area often results in the cayes being used for short stays of a day or two. Of the current eight resorts/tourist accommodations on cayes within the region, four are on national land.

National Parks in Belize are established under the National Parks System Act with the management objectives of habitat and species protection, preservation of natural and scenic features of national significance, research and education, tourism and recreation. Formal responsibility is exercised by the Conservation Division of the Forest Department, though the Division has no budget for the management of the parks.

Laughing Bird Caye National Park (LBCNP) is located in the Southern Reef Complex, an area that stretches from Blue Ground Range to Ranguana Caye along the reef system. The park was declared in 1996, originally only designating the terrestrial area of the caye. In 1999, the park was expanded to include a one mile radius of marine area in order to include the faro within park boundaries. A broad

lagoon filled with a variety of reef structures – pinnacles, patch reefs, and atolls – characterizes this Complex. LBCNP comprises a 1.4 acre island, with several patch reefs. It lies halfway between Placencia Village and the barrier reef at latitude 16° 26.59'N and longitude 88° 11.85'W. The LBCNP is located just twelve miles off the coast of the Placencia Peninsula and nine miles from the Barrier Reef platform. The Laughing Bird faro lies east of a deep channel, known as the Victoria Channel, that hosts a variety of marine organisms and twenty-four species of fish including snook, tarpon and jacks. This well formed “faro” is a large submerged limestone structure that consists of an outer rim enclosing other reefs and lagoons. The rim walls are narrow and steep and the inner reefs are variable in size and form. This complexity forms the habitats for a wide diversity of organisms.

The caye obtained its name from the laughing gulls (*Larus atricilla*) that once nested on the north end of the caye. Anecdotal evidence indicates that the birds moved off the Caye in the mid-70s after the combined impacts of increased human presence, damage from Hurricane Fifi in 1974, and local residents harvesting the eggs (Bevier and Young, 1999). The gulls have moved to nearby cayes for nesting and still can be seen occasionally on Laughing Bird Caye. Many other birds also frequent the Caye including the Brown Pelican (*Pelicanus occidentalis*), Green Heron (*Butorides viriscens*), Melodious Blackbird (*Dives dives*), and osprey (*Pandion haliaetus*).

Laughing Bird Caye is a sand and shingle island of 1.4 acres located on the windward rim of the Faro about 19 km from Placencia and nine miles from the Barrier Reef platform. The Caye is about 425 m (1400 feet) long and ranges in width from 6 to 36 m (20 to 120 feet). The windward side holds a ridge of coral rubble and a sandy beach on the leeward edge (Naturalight, 1999). The island is covered with coconut trees and mangroves. Seven plant species are listed for Laughing Bird Caye:

- ◆ Coconut palm (*Cocos nucifera*)
- ◆ Spider lily (*Hymenocallis littoralis*)
- ◆ Seaside purslane (*Sesuvium portulacastrum*)
- ◆ *Euphorbia* sp.
- ◆ Red mangrove (*Rhizophora mangle*)
- ◆ Morning glory (*Ipomoea* sp.)
- ◆ Black mangrove (*Avicennia germinans*).

Anole lizards and hermit crabs are abundant on Laughing Bird Cay. However no surveys of these creatures have been done. (Naturalight Productions, 1999).

Laughing Bird Faro rises out of deep (*ca.* 150 feet) water, Victoria Channel to the east and the inner lagoon to the west; it encloses a densely pinnacled lagoon. The lagoon floor is about 80 feet deep with spires rising 50-60 feet. The windward side of these are within 10 feet of the surface in most places. The reef on the windward rim is a *Montastrea - Acropora palmata* community similar to that found on the main barrier platform. A well-developed beach ridge composed mainly of *A. palmate* rubble stripes the windward side of Laughing Bird Caye. The leeward rim and the deep slopes of the faro are mantled by dense stands of *Acropora cervicornis* (Wandtland and Pusey, 1971).

In October 2001, Hurricane Iris devastated the southern portion of Belize. Hardest hit were the villages of Placencia and Monkey River and Laughing Bird Caye National Park. Laughing Bird Caye lost significant vegetation on the island, infrastructure was destroyed, and changes occurred in the physical structure of the island. The damage to Laughing Bird Caye’s reef was considerable. Coincidentally, coral surveys had been done one month before the storm. Follow-up surveys after Iris showed an increase in recent mortality from 2.8% to 19.6% and an increase in mechanical damage from <1% to 70.7%. This damage coupled with results of an horrific bleaching event in 1998 has had massive effects on Laughing Bird Caye’s reefs.

Fishers from Placencia, Monkey River, Independence, Hopkins and Riversdale have used the area for harvesting finfish, conch and lobster using a variety of fishing gear though the level of activity had begun to decrease into the 1980s. Fishermen camped on Laughing Bird Caye and fished in the area, taking advantage of coconuts found on the caye. The Placencia area has the third largest concentration of

fishing vessels in the country. Fishing is important to Placencia, with 69 registered fishing vessels in 1999. There has been intensive visitation and disturbance of the caye area from visitors, fishers and tourists.

Laughing Bird Caye has been a favorite snorkeling destination for tourists visiting Placencia. There has been considerable degradation of the reef in LBCNP primarily due to high turbidity and physical damage from uncontrolled tourism activities that began in the early 1980s. Physical damage from improper anchoring of tourist vessels and fishing boats has been reported in the Park. The stocks of fish continue to decline and to be threatened by illegal fishing and camping by fishermen, which has also led to the destruction of the caye's vegetation.

With the development of tourist facilities on the mainland, deleterious effects to the park can be observed as a result of agricultural runoff and inappropriate disposal of sewage and solid waste. Dredging within Placencia Lagoon may also be having negative effects on the Park. A number of dredging permits have been granted recently which give way to suspended sediments in the water and threats to coral reefs.

Marine Reserves in Belize are established under the Fisheries Act for the management and preservation of all biological communities and species including commercial species and their habitats, research, visitation, and controlled extractive use (within specified zones). Marine reserves may include terrestrial areas either as islands or adjacent mainland. All marine reserves are under the responsibility of the Fisheries Department. A minimal budget allotted to the Department means that there is little support for enforcement activities, and for the management and development of reserves.

The central region of the Barrier Reef contains the best-developed and most continuous reef due to its elevation, good water quality, and modified wave regime. However, the southernmost tip of this area lies just below the wave shadow of Glover's Atoll. It is called The Elbow, "Point-of-Reef" (in Kriol), or Gladden Spit, and it lies about 36 km from the coast at Placencia. It is well-known locally for the annual aggregations of fish that migrate to the area to spawn, attracting whale sharks around the time of the full moons of April-June. As a result, the area has become a popular site for both commercial fishermen and dive operators.

Placencia is a small peninsula stretching out from the south coast of Belize. It meets the sea on the eastern side and the Placencia lagoon and mangrove forests on the west side. Among the many bird species noted in the village are the iguanas and diverse flora. Some of the people in southern communities are settlers who have migrated from the adjoining parts of Guatemala and Honduras (Palacio, 2001). The predominant ethnic group in Placencia is Creole, others include Mestizos, Garifuna, East Indians. Placencia's white sandy beaches and its proximity to the southern outer cayes, atolls and the barrier reef make it a tourist destination, thus making tourism and fishing its main sources of income. The village is so small that everyone knows everyone. They are quite friendly and polite. People greet each other "good morning" and "good afternoon".

Hopkins is a Garifuna fishing village located on the coast of southern Belize (see location map). Hopkins is a quiet, traditional village where old customs, including the Garifuna language, survive. Modern conveniences have been available only since the early 1990's. Hopkins' distinct culture and laid back pace make for an interesting destination. Hopkins has one of Belize's few mainland beaches. Marshy landscape surrounded by tropical rainforest, caves, magnificent rivers, savannas, cayes, lagoons, Maya sites, mountains and waterfalls make it one of the main tourist destinations in the country. The village depends on fishing as one of its main sources of income. The marshy landscape surrounding the village is the home of many bird species including the Jabiru stork. Time moves slowly, the men of the village fish and carve canoes while the women can be found weaving baskets and singing together.

Monkey River (see location map), is a very small Creole village along the coast in southern Belize. The Monkey River flows from the Maya Mountains at the Guatemala border through southern Belize to the Gulf of Honduras. It supports one of the most pristine coral reefs in Central America, which is part of the second largest barrier-reef system in the world. The river is one of six large watersheds in the million-acre Maya Mountain Marine Area Transect, which connects the Maya Mountains to the coastal waters of the Gulf Honduras. The five ecosystems here (uplands forests, coastal plain, freshwater,

estuarine and coral reef) support large and uncommon predators, rare birds and 29 of the 78 natural vegetation types in the country, as well as species dependent on fresh and salt water. Among these are the jaguar, jaguarundi, yellow-headed parrot, manatee, jewfish, puma, ocelot, margay, tapir, peccary, dolphin, hawksbill turtle, iguana, hicatee turtle, howler and spider monkeys, crocodiles and snakes. Forest areas support the largest tropical rainforest in Belize. The coastal area provides one of the richest and most critically important mangroves in the Caribbean. (www.nature.org).

3 METHODOLOGY

The data were collected through interviews carried out in the three communities using a household questionnaire (Appendix I). The method for data collection is based on the *Socioeconomic Monitoring Guidelines for Coastal Managers in the Caribbean* (Bunce and Pomeroy, 2003) and the *Socioeconomic Manual for Coral Reef Management* (Bunce et al, 2000). The sample size used was 10% of the population of the communities, as shown in Table 3.1.

Table 3.1 Socioeconomic assessment sample size

Village	Population in 2000	Sample size (10%)
Placencia	458	46
Monkey River	176	18
Hopkins	994	100

In Placencia, twenty-five households were interviewed, every third or fourth house on the east side of the road that goes through the village and twenty-five on the west side of the road with the same distribution. Everyone approached was willing to provide information. In Hopkins, not everyone was willing to be interviewed. One hundred households distributed throughout the village were interviewed. In Monkey River, two interviews were conducted in one evening. The following day almost the whole village was going for a Tour Guide Training Practical (tour guides and their families) to Toledo. The remaining sixteen interviews were conducted in the bus.

The data gathered were entered in an Excel spreadsheet using a coding scheme and entered as quantitative data (Appendix II). The data gathered were quantitative, and could be analyzed statistically. The distribution of variables between and within stakeholder groups and the larger communities was determined. Comparisons were drawn between and within stakeholder groups and the larger communities.

At times it was difficult to determine to what extent informants were providing information as it occurred in the case where one respondent claimed not to know about any fishing regulation and has been a fisherman all his life. In another case, one respondent claimed not to be a fisherman but went fishing everyday and had many lobster traps around his house and additionally, owned a boat. Some respondents claimed to have been previously interviewed by other people who came to the village doing research and so far they have not seen a good outcome from these interviews. This may account for those who were unwilling to be interviewed.

4 RESULTS AND DISCUSSION

4.1 Household demographics

The average household size in Placencia was 4 persons with a range of 1 person to 9 persons per house. In Hopkins, the average household size was 5 persons with a range of 1 person to 12 persons per house. In Monkey River, the average household size is 6 persons with a range of 1 person to 12 persons

per house. The average number of years households have been located in Placencia is 17 years with a range of 1 year to 100 years. In Hopkins, the average number of years households have been located in the village is 17 years with a range of 1 year and 73 years. In Monkey River, the average number of years households have been located in the village is 10 years with a range of 2 years to 50 years.

For the majority of the population in the villages, lobster fishing, tour guiding (fish, snorkel, and dive tour guides) and entrepreneurship (hotel owner, restaurant and bar owner, snorkel and dive shop owner) were the three primary occupations for income generation. For some families, their primary occupation for income generation included administrative work such as bank tellers, receptionists and cashiers, military (Belize Defense Force and Belize Police Force), drivers, teachers and retiree. For other families, their primary occupation for income generating was related to tourism (waitress, bartender). The primary, secondary and tertiary occupations based on responses in the 3 villages are summarized in Tables 4.1, 4.2 and 4.3. The percent of respondents in all the tables are those interviewed from the 10% sample size of the population.

Table 4.1 Occupations of respondents in Placencia

Primary occupation	% of respondents	Secondary occupation	% of respondents	Tertiary occupation	% of respondents
Fisherman	32	Fisherman	18	Fisherman	4
Work related to Tourism e.g. bartender	6	Work related to Tourism e.g. bartender	9	Work related to Tourism e.g. bartender	0
Tour guide	18	Tour guide	36	Tour guide	0
Entrepreneur e.g. hotel owner, dive shop owner	32	Entrepreneur e.g. hotel owner, dive shop owner	9	Entrepreneur e.g. hotel owner, , dive shop owner	4
Other	12	Other	27	Other	8
Retired	0	Retired	0	Retired	0

Table 4.2 Occupations of respondents in Hopkins

Primary occupation	% of respondents	Secondary occupation	% of respondents	Tertiary occupation	% of respondents
Fisherman	28	Fisherman	6	Fisherman	0
Work related to Tourism e.g. bartender	15	Work related to Tourism e.g. bartender	27	Work related to Tourism e.g. bartender	0
Tour guide	5	Tour guide	14	Tour guide	1
Entrepreneur e.g. hotel owner, dive shop owner	21	Entrepreneur e.g. hotel owner, dive shop owner	22	Entrepreneur e.g. hotel owner, dive shop owner	3
Other	25	Other	31	Other	9
Retired	6	Retired	0	Retired	0

Table 4.3 Occupations of respondents in Monkey River

Primary occupation	% of respondents	Secondary occupation	% of respondents	Tertiary occupation	% of respondents
Fisherman	50	Fisherman	12	Fisherman	0
Work related to Tourism e.g. bartender, waitress	0	Work related to Tourism e.g. bartender, waitress	0	Work related to Tourism e.g. bartender, waitress	0
Tour guide	22	Tour guide	41	Tour guide	6
Entrepreneur e.g. hotel owner, restaurant owner, dive shop owner	22	Entrepreneur e.g. hotel owner, restaurant owner, dive shop owner	6	Entrepreneur e.g. hotel owner, restaurant owner, dive shop owner	6
Other	6	Other	41	Other	0
Retired	0	Retired	0	Retired	0

Among the most important sources of income in the villages are lobster fishing, tour guiding, and entrepreneurship. Entrepreneurs include hotel owners, restaurant owners, dive shop owners, snorkel shop owners and storeowners. Other sources of income include jobs related to tourism such as waiting tables, bar tending, working in hotel receptions, cooking in restaurants, and working in Internet cafes. Other sources of income include salaries from teaching, driving taxies and buses, masonry, military, bank telling, secretaries, accountants, working with the telephone company, working with the electricity company, etc. Some look after obtaining income from tips from tourists and pension. Tables 4.4, 4.5 and 4.6 summarize household's primary, secondary and tertiary most important sources of income in the three villages.

Table 4.4 Sources of income in Placencia

Primary source of income	% of respondents	Secondary source of income	% of respondents	Tertiary source of income	% of respondents
Fishing	30	Fishing	24	Fishing	13
Tourism job	32	Tourism job	6	Tourism job	0
Tour guide	20	Tour guide	33	Tour guide	0
Entrepreneur	32	Entrepreneur	9	Entrepreneur	25
Other	12	Other	27	Other	63

Table 4.5 Sources of income in Hopkins

Primary source of income	% of respondents	Secondary source of income	% of respondents	Tertiary source of income	% of respondents
Fishing	28	Fishing	6	Fishing	0
Tourism job	15	Tourism job	25	Tourism job	0
Tour guide	5	Tour guide	12	Tour guide	21
Entrepreneur	22	Entrepreneur	24	Entrepreneur	21
Other	24	Other	33	Other	57
Pension	6	Pension	0	Pension	0

Table 4.6 Sources of income in Monkey River

Primary source of income	% of respondents	Secondary source of income	% of respondents	Tertiary source of income	% of respondents
Fishing	50	Fishing	11	Fishing	0
Tourism job	0	Tourism job	0	Tourism job	0
Tour guide	22	Tour guide	39	Tour guide	50
Entrepreneur	22	Entrepreneur	6	Entrepreneur	50
Other	6	Other	0	Other	0

The percentages of females engaged in an income generating activity in the three villages are summarized in Table 4.7. Less than 50% of the females in the 3 villages are engaged in an income generating activity, with Monkey River having the least percentage. The activities females engage in to generate income include entrepreneurship (owning their own business), tour guiding, tourism related work (waitress, bartender, chef, hotel cleaner), and others such as bank manager, bank teller, primary school teacher. The results are summarized in Table 4.8.

Table 4.7 Percentage of females engaged in an income generating activity

Village	% Females engaged in an income generating activity
Placencia	44
Hopkins	48
Monkey River	28

Table 4.8 Activities females engage in to generate income

Activity females engage in to generate income	Placencia	Hopkins	Monkey River
Entrepreneur	45%	30%	60%
Tour Guide	5%	4%	20%
Other (administrative)	5%	4%	20%
Tourism related work (waitress, cook, receptionist)	45%	62%	0%

The mean number of days households fish to supply food in Placencia is 4 days a month, 7 days a month in Hopkins and 10 days a month in Monkey River. Persons who have membership in at least one national

or international organization include 70% of the people in Placencia, 49% of the people in Hopkins and 72% of the people in Monkey River. The noted family members belonging to organizations are shown in Table 4.9. Organizations most noted for membership included national organizations. These included the only two fishing co-operative associations (Northern Fishermen Cooperative Association and National Fishermen Cooperative Association), tour guide associations (Placencia Tour Guides, Hopkins Tour Guides, Monkey River Tour Guides, and the National Association of Specialist and Interpretive Guides (NASIC)), and the Belize Tourism Industry Association (BTIA) (see Table 4.10). Others included organizations inside the village and outside the village. Those inside the village included dance groups such as the Garifuna Dance Council, village council, church and youth groups. Organizations outside the village included the Humane Society, the Belize Red Cross, the Citrus Growers Association, the Belize Hotel Association, and Help Age Belize.

Table 4.9 Noted family members belonging to organizations

Village	Noted family members	% of respondents belonging to an organization
Placencia	Father	54
	Son	11
	Daughter	6
	Mother	29
Hopkins	Father	42
	Son	17
	Daughter	15
	Mother	27
Monkey River	Father	54
	Son	15
	Daughter	15
	Mother	15

Table 4.10 Membership of noted organizations

Village	Noted organization	% respondent membership
Placencia	Fishing co-operatives	17
	Tour Guide Association	14
	BTIA	20
	Organization outside the village	11
	Organization inside the village	37
Hopkins	Fishing co-operatives	4
	Tour Guide Association	15
	BTIA	4
	Organization outside the village	13
	Organization inside the village	65
Monkey River	Tour Guide Association	77
	Organization inside the village	23

4.2 Material lifestyle

Information was obtained on the material style of life of the respondents by both interview and observation of household asset ownership. For housing, observations were made for type of roof, type of outside wall structure, types of windows, and type of floors. The most common houses in the three villages are tin roof, wooden walls with wooden shutters and wooden floor. The results are summarized in Table 4.11.

Table 4.11 Percent of houses with different types of roof, walls, windows and floors in the three communities

Village	Type of roof	Type of outside structural walls	Windows	Floors
Placencia	Tin 82%	Wood 72%	Wooden Shutters 60%	Cement 38%
	Thatch 2%	Cement 24%	Metal Shutters 20%	Wood 56%
	Cement 16%	Plywood 4%	Glass Shutters 16%	Tile 4%
	Shingle 0%		Glass 4%	Dirt 0%
				Carpet 2%
Hopkins	Tin 71%	Wood 64%	Wooden Shutters 74%	Cement 34%
	Thatch 8%	Cement 33%	Metal Shutters 17%	Wood 50%
	Cement 19%	Plywood 3%	Glass Shutters 6%	Tile 6%
	Shingle 2%		Glass 2%	Dirt 5%
			None 1%	Carpet 5%
Monkey River	Tin 100%	Wood 61%	Wooden Shutters 67%	Cement 33%
	Thatch 0%	Cement 22%	Metal Shutters 17%	Wood 67%
	Cement 0%	Plywood 17%	Glass Shutters 16%	Tile 0%
	Shingle 0%		Glass 0%	Dirt 0%
				Carpet 0%

The respondents were also asked to list whether they owned the household items listed in Table 4.12.

Table 4.12 Percentage of houses that own the following household items

Possessions	Placencia	Hopkins	Monkey River
Land	80%	97%	78%
House	80%	99%	78%
Boat	64%	52%	78%
Car	26%	24%	17%
Washer	80%	48%	39%
VCR	86%	43%	22%
Cell phone	72%	58%	44%
TV	98%	81%	33%
Stereo	84%	61%	44%
Refrigerator	98%	69%	33%
Stove	98%	91%	83%

The majority of the respondents in the three villages own land and a house. It is important to note that Placencia respondents form the largest percentage that own household items. It is also important to

note that Monkey River respondents form the smallest percentage that own household electrical appliances. Many claimed that they didn't see the need for these as the village has been without electricity since hurricane Iris. However, more than eighty percent of respondents in the three communities own a stove. Being coastal fishing communities, it is not surprising that more than fifty percent of the households in the three communities own a boat and less than fifty percent do not own a car or vehicle.

4.3 Coastal and marine activities

A coastal and marine activity that the households engage in on a regular basis includes fishing for subsistence. In Placencia and Hopkins, fishing is done just off the beach or in the outer sea. In Monkey River, fishing is done in the river or off the beach or outer sea. Recreational activities that the households engage in on a regular basis include snorkeling, diving, and boating. Other recreational activities include swimming, sunbathing and walking the beach. The results are summarized in Table 4.13.

Table 4.13 Marine recreational activities households engage on a regular basis

Marine Activity	Placencia	Hopkins	Monkey River
Fishing	8%	40%	0%
Snorkeling	10%	6%	11%
Diving	16%	6%	33%
Boating	4%	1%	0%
Other	38%	19%	44%
None	24%	28%	11%

4.4 Attitudes and perceptions

The respondents were asked to indicate the condition of the marine resources five years ago versus today using the scale: (1) Very good, (2) Good, (3) Not good not bad, (4) Bad, (5) Very Bad. The results are summarized in Tables 4.14, 4.15 and 4.16. Placencia responses varied the most; some respondents claimed that the marine conditions were better five years ago and some claimed the conditions are better today. In Hopkins and Monkey River, however, the respondents claimed that the conditions of the marine resources were better five years ago than today. In summary, all three communities claimed that the conditions of the marine resources are worse today than five years ago.

Table 4.14 Perceptions of marine conditions in Placencia

Condition	Today	Five years ago
Very Good	18%	16%
Good	38%	48%
Not Good Not Bad	12%	26%
Bad	30%	6%
Very Bad	2%	4%

Table 4.15 Perceptions of marine conditions in Hopkins

Condition	Today	Five years ago
Very Good	15%	32%
Good	27%	43%
Not Good Not Bad	14%	11%
Bad	19%	7%
Very Bad	25%	7%

Table 4.16 Perceptions of marine conditions in Monkey River

Condition	Today	Five years ago
Very Good	11%	17%
Good	28%	67%
Not Good Not Bad	28%	17%
Bad	33%	0%
Very Bad	0%	0%

The respondents were asked to indicate whether they were obtaining benefits from developments in the area. Of the Placencia respondents, 74% felt they are obtaining benefits, 39% in Hopkins and 83% in Monkey River. Among the perceived benefits for the respondents are economic, educational and other benefits such as being able to have water, electricity, ATM at the bank and access roads. Economic benefits for the respondents include more income generation from tourism in their hotels and restaurants, more fish being sold to the restaurants, more lobster taken to the cooperatives for export, more tours sold at the dive and snorkel shops. Educational benefits to respondents include being able to learn about the importance of tourism, about being able to participate in courses such as the Tour Guide Training Course being implemented by the Belize Tourist Board (BTB), being able to send their children to school, and being able to participate in workshops given to fishermen. Table 4.17 summarizes the results.

Table 4.17 Perceived benefits as a result of development in the village

Benefit	Placencia	Hopkins	Monkey River
Economic	97%	78%	87%
Educational	3%	15%	7%
Other	0%	8%	7%

The respondents were asked whether they believed the community could work together to solve community problems. Of the Placencia respondents, 28% believe they can work together to solve problems in the community, 59% in Hopkins and 12% in Monkey River. In Placencia, 29% of the respondents felt that the fishermen could work together to solve problems in the fishery, 64% of the respondents in Hopkins and 7% of the respondents in Monkey River. The respondents were asked who they believed should solve problems in the fishery by giving them the following choices (1) Government, (2) People, (3) Both Government and People. The results are summarized in Table 4.18.

Table 4.18 Who should solve problems in the fishery

Village	Government	People	Both
Placencia	0%	4%	96%
Hopkins	3%	5%	92%
Monkey River	0%	0%	100%

The respondents were asked to provide a list of community threats. The major ones included drugs (mainly marijuana and cocaine), natural disaster (hurricane and floods), outsiders (referring mostly to Americans who own hotels, restaurants, dive shops and other tourism businesses that compete with the locals). Secondary threats to overdevelopment include sewage and solid waste accumulation, water pollution, no more land available for housing, and no beaches to swim freely. Erosion was noted to be a big threat to Monkey River. Monkey River is the only river along this part of the coast supporting a significant human population at the river mouth, as the high, wide beach ridge provides ground for building. It is the fourth largest watershed in Belize, draining approximately 127,558ha, and the discharge during times of heavy rainfall has tremendous force causing the series of bars at the river mouth to shift frequently and dramatic changes in accretion and erosion of the beach sands to the south. (CZMAI, 2001). Other respondents did not want to comment on the threats. The results are summarized in the tables 4.19, 4.20 and 4.21.

Table 4.19 Perceived community threats in Placencia

Identified threats	% noting this threat
Drugs	26
Natural disaster	10
Outsiders and overdevelopment	4
Secondary threats due to overdevelopment	16
No comments/don't know	44

Table 4.20 Perceived community threats in Hopkins

Identified threats	% noting this threat
Drugs	7
Natural disaster	39
Outsiders and overdevelopment	8
Secondary threats due to overdevelopment	10
No comments/don't know	36

Table 4.21 Perceived community threats in Monkey River

Identified threats	% noting this threat
Drugs	0
Natural disaster	17
Outsiders and overdevelopment	0
Secondary threats due to overdevelopment	0
Erosion	44
No comments/don't know	39

The respondents were asked to provide a list of community problems. The major ones included drugs among the youths, and lack of enforcement resulting in crime in the 3 villages. At present, Placencia doesn't have a Police Station, Monkey River has one but no officers are available, Hopkins has a Police Station with officers but there is a lack of enforcement. Lack of support among community members was another noted problem, especially in Monkey River. Unemployment, disease and teenage pregnancy were also noted. Some respondents stated that unemployment lead to drug use and abuse and crime. Some also noted disease as a problem and claimed that tourism played a role in disease transmission, especially sexually transmitted diseases. Others were concerned that a lack of adequate health facilities and medicine was a problem to disease prevention and cure. Some were concerned about the increasing incidence of teenage pregnancy. The respondents in Monkey River were very much concerned with the unavailability of services such as electricity, very few teachers in the primary school, no telephone lines, and no potable water, all of which have not been reinstalled since hurricane Iris in October 2001. In Hopkins, some respondents were concerned about the lack of bank services and markets. Others simply didn't want to comment or didn't know. The results are summarized below in Tables 4.22, 4.23 and 4.24.

Table 4.22 Perceived community problems in Placencia

Identified problems	% noting this problem
Drugs	30
Lack of enforcement of regulations resulting in crime in Hopkins/no police station in Placencia and Monkey River	4
Lack of support among community members	24
No comments/don't know	42

Table 4.23 Perceived community problems in Monkey River

Identified problems	% noting this problem
Lack of support among community members	33
Unemployment, disease, teenage pregnancy	11
No services (bank, markets, electricity)	17
No comments/don't know	39

Table 4.24 Perceived community problems in Hopkins

Identified problems	% noting this problem
Drugs	26
Lack of enforcement of regulations in crime in Hopkins/no police station in Placencia and Monkey River	15
Foreign investment	1
Lack of support among community members	14
Unemployment, disease, teenage pregnancy	18
No services (bank, markets, electricity)	1
No comments/don't know	25

The respondents were asked to provide a list of possible solutions to these problems. The responses included police enforcement in Hopkins, police officers assigned to Monkey River and a police

station in Placencia. Hopkins respondents stated that more jobs and recreation activities should be made available to stop crime and drugs. To gain support among community members, the responses included workshops to be held to enhance communication. Monkey River respondents stated their urgent need for services to be reinstated in the village. Other respondents simply didn't comment or didn't know. The results are summarized in Tables 4.25, 4.26 and 4.27.

Table 4.25 Perceived community solutions in Placencia

Suggested solution	% suggesting solution
Police enforcement in Hopkins/GOB should have police officers in Monkey River and Placencia	32
GOB should make intervention (through Village Council)	4
Education and communication	20
Don't know	44

Table 4.26 Perceived community solutions in Hopkins

Suggested solutions	% suggesting solution
Police enforcement in Hopkins/GOB should have police officers in Monkey River and Placencia	8
More jobs and recreation activities should be made available	14
GOB should make intervention (through the Village Council)	3
Education and communication	34
Services should be made available (especially electricity in MR)	1
Don't know	40

Table 4.27 Perceived community solutions in Monkey River

Suggested solution	% suggesting solution
Police enforcement in Hopkins/GOB should have police officers in Monkey River and Placencia	17
Education and communication	17
Services should be made available (especially electricity in MR)	11
Don't know	56

The respondents were asked to provide a list of perceived threats to marine resources. The most noted threat was illegal fishing and overfishing. These include fishing during closed seasons, and fishing undersized lobster and conchs. Tourism is perceived as a threat because of the damage some tourists create by breaking off corals, touching corals, standing on corals, and collecting marine life like aquarium fish. Natural disasters, especially hurricanes, are perceived as a threat since some hurricanes have destroyed parts of the reef in Belize, threatening to reduce the fish stocks and tourism visitation. Shrimp

trawling was a noted threat as it is seen as a competition with the fishers. Some of the respondents stated that the by-catch from the shrimp trawlers was killing the reef. Hopkins and Monkey River residents stated their concern with the competition faced with Honduranian fishermen who trespass the international boundary and fish in the southern Belizean waters for most of the year. “The attraction of Belizean Southern waters to fisherfolk from the neighboring countries dwarfs these incursions from northern and central Belize. There are over 200,000 persons in those countries inhabiting their Caribbean waters adjoining Belize, which have less of the natural bounty with which Belize is blessed. This figure contrasts with the approximately 5,000 Belizeans inhabiting the South Coast (Heyman and Graham 2000). Some respondents didn’t comment or didn’t know. The results are summarized in Tables 4.28, 4.29 and 4.30.

Table 4.28 Perceived threats to marine resources in Placencia

Identified threats	% noting this threat
Overfishing and illegal fishing	32
Tourism	6
Natural disasters	10
Shrimp trawling is killing the reef and the fishing industry	8
No comment/don’t know	44

Table 4.29 Perceived threats to marine resources in Hopkins

Identified threats	% noting this threat
Overfishing and illegal fishing	15
Tourism	16
Natural disasters	6
Shrimp trawling is killing the reef and the fishing industry	10
Honduranians fishing in Belizean waters	2
No comment/don’t know	51

Table 4.30 Perceived threats to marine resources in Monkey River

Identified threats	% noting this threat
Overfishing and illegal fishing	44
Natural disasters	6
Shrimp trawling is killing the reef and the fishing industry	6
Honduranians fishing in Belizean waters	6
No comment/don’t know	39

The respondents were also asked to list perceived problems for marine resources. Pollution was noted in all three villages, respondents claimed it comes as runoff from the shrimp farms. Of the nine producing shrimp farms in the country five are located within the Placencia-Monkey River area. Furthermore, the banana industry remains concentrated in the hinterland behind the Placencia Lagoon in the border area of the Stann Creek and Toledo Districts. Some Hopkins respondents noted lack of enforcement of fisheries regulations. Overfishing, illegal fishing, overexploitation and poaching were noted in the 3 villages. Some of the fishers stated that one of their major concerns was poaching of their

lobster traps by other fishers. Respondents in Placencia showed a concern of little efforts being made to study carrying capacity and tourist surveys that are important to save the reefs. In Hopkins, some of the respondents were not satisfied with the fact that many villagers were dumping their garbage in the sea and in some beach areas. The results are summarized in Tables 4.31, 4.32 and 4.33

Table 4.31 Perceived problems for the marine resources in Placencia

Identified problems	% noting this problem
Pollution (esp. pesticide runoff from shrimp farms)	10
Overfishing and illegal fishing, overexploitation and poaching	28
Other (carrying capacity is exceeded, tourism destroys reef)	8
No comment/don't know	54

Table 4.32 Perceived problems for the marine resources in Hopkins

Identified problems	% noting this problem
Pollution (esp. pesticide runoff from shrimp farms)	8
Lack of enforcement	5
Overfishing and illegal fishing, overexploitation and poaching	10
Garbage in the sea	4
No comment/don't know	73

Table 4.33 Perceived problems for the marine resources in Monkey River

Identified problems	% noting this problem
Pollution (esp. pesticide runoff from shrimp farms)	50
Overfishing and illegal fishing, overexploitation and poaching	6
No comment/don't know	44

The respondents were asked to provide a list of possible solutions to these problems. Among the responses were education and enforcement, more research about marine life, implantation of pollution control methods, conservation practices such as longer closed season, allow only southern fishermen to fish in southern waters, establish guidelines, throw back female lobsters and fish back in the water, etc. Some respondents didn't know or didn't comment. Results are summarized in Tables 4.34, 4.35 and 4.36.

Table 4.34 Perceived marine resource solutions in Placencia

Suggested solution	% suggesting solution
Education and enforcement	4
More research on marine life (e.g. carrying capacity study)	44
Control pollution	48
Conservation practices	4

Table 4.35 Perceived marine resource solutions in Hopkins

Suggested solution	% suggesting solution
Education and enforcement	2
More research on marine life (e.g. carrying capacity study)	27
Control pollution	68
Conservation practices	1
Don't know	2

Table 4.36 Perceived marine resource solutions in Monkey River

Suggested solution	% suggesting solution
More research on marinelife (e.g. carrying capacity study)	39
Control pollution	56
Conservation practices	6

4.5 Friends of Nature

The respondents were asked whether they were familiar with Friends of Nature (FON). In Placencia, 47% of the respondents claimed they have heard or knew about Friends of Nature, 39% in Hopkins and 14% in Monkey River. They were asked whether they knew the main purpose of Friends of Nature. The responses are summarized in Tables 4.37, 4.38 and 4.39.

Table 4.37 Placencia respondents' answers as to the main purpose of FON

Main purpose of FON	%
Co-management or management of Protected Area or Marine Reserve	27
Protection, preservation and management of natural resources, education	58
Don't know	15

Table 4.38 Hopkins respondents' answers as to the main purpose of FON

Main purpose of FON	%
Co-management or management of Protected Area or Marine Reserve	5
Protection, preservation and management of natural resources, education	82
Don't know	13

Table 4.39 Monkey River respondents' answers as to the main purpose of FON

Main purpose of FON	%
Co-management or management of Protected Area or Marine Reserve	50
Protection, preservation and management of natural resources, education	43
Don't know	7

Other responses included:

- Patrol Belizean waters
- Manage marine reserves
- Research the marine life
- Protect the reef for tourism

Negative responses included:

- FON is taking away fishing grounds from fishermen
- FON has too many rules in the marine reserves

The respondents were asked if they knew about activities FON has done that have worked well.

Tables 4.40, 4.41 and 4.42 summarize the results.

Table 4.40 FON activities that have worked well for Placencia respondents

Successful FON activities in Placencia	% respondents noting these activities
Outreach and education program, especially the meetings with fishermen and summer camp with children at Laughing Bird Caye	20
Training, especially the dive master course offered to tour guides	10
Other (parks implementation and enforcement)	36
High school scholarship given to children of the different villages	8
Don't know	26

Table 4.41 FON activities that have worked well for Hopkins respondents

Successful FON activities in Hopkins	% respondents noting these activities
Outreach and education program, especially the meetings with fishermen and summer camp with children at Laughing Bird Caye	28
Training, especially the dive master course offered to tour guides	3
Other (parks implementation and enforcement)	23
High school scholarship given to children of the different villages	13
Don't know	33

Table 4.42 FON activities that have worked well for Monkey River respondents

Successful FON activities in Monkey River	% respondents noting these activities
Outreach and education program, especially the meetings with fishermen and summer camp with children at Laughing Bird Caye	7
Training, especially the dive master course offered to tour guides	29
Other (parks implementation and enforcement)	21
High school scholarship given to children of the different villages	29
Don't know	14

The respondents were asked if they knew about things that FON has done that have **not** worked well. Tables 4.43, 4.44 and 4.45 summarize the results.

Table 4.43 FON activities that have not worked well for Placencia respondents

Unsuccessful FON activities in Placencia	% respondents noting these activities
The way information is disseminated in the community	10
The way patrolling/enforcement is done (not enough patrols, rangers don't know how to approach fishermen)	8
Other (FON not considering fishermen, closing fishing grounds for protection)	6
Don't know	76

Table 4.44 FON activities that have not worked well for Hopkins respondents

Unsuccessful FON activities in Hopkins	% respondents noting these activities
The way information is disseminated in the community	11
The way patrolling/enforcement is done (not enough patrols, rangers don't know how to approach fishermen)	3
Other (FON not considering fishermen, closing fishing grounds for protection)	8
Don't know	78

Table 4.45 FON activities that have not worked well for Monkey River respondents

Unsuccessful FON activities in Monkey River	% respondents noting these activities
Other (FON not considering fishermen, closing fishing grounds for protection)	14
Don't know	86

Recommendations for improvement in coastal/marine management in the community based on responses are summarized in Tables 4.46, 4.47 and 4.48.

Table 4.46 Recommendations for marine management in Placencia

Placencia recommendation(s)	% respondents suggesting the recommendation(s)
Increase community awareness on marine reserves, education and training	39
More and better patrolling, enforcement, regulations, guidelines	18
No more improvements, they are doing fine	16
No comments	27

Table 4.47 Recommendations for marine management in Hopkins

Hopkins recommendation(s)	% respondents suggesting the recommendation(s)
Increase community awareness on marine reserves, education and training	28
More and better patrolling, enforcement, regulations, guidelines	22
No more improvements, they are doing fine	6
No comments	44

Table 4.48 Recommendations for marine management in Monkey River

Monkey River recommendation(s)	% respondents suggesting the recommendation(s)
More and better patrolling, enforcement, regulations, guidelines	29
No more improvements, they are doing fine	7
No comments	64

In Placencia 69% of the respondents knew who represented the village on the FON board of directors, 16% knew in Hopkins and 15% knew in Monkey River. In Placencia, 57% said that they were consulted on decisions made by FON, 32% in Hopkins and 11% in Monkey River. The respondents were asked to indicate the average level of participation they experience in coastal management decision making using a scale of (1) Full active participation, (2) Active participation, (3) Some participation, (4) Little participation, (5) No participation. The results are summarized in Table 4.49, 4.50 and 4.51.

Table 4.49 Level of participation in coastal management decision-making in Placencia

Level of participation	% respondents
Full active participation	20
Active participation	22
Some participation	34
Little participation	14
No participation	10

Table 4.50 Level of participation in coastal management decision-making in Hopkins

Level of participation	% respondents
Full active participation	11
Active participation	8
Some participation	29
Little participation	37
No participation	16

Table 4.51 Level of participation in coastal management decision-making in Monkey River

Level of participation	% respondents
Full active participation	21
Active participation	0
Some participation	29
Little participation	29
No participation	21

The respondents were asked to provide recommendations for improvement in participatory decision-making by FON. The results are summarized in Tables 4.52, 4.53 and 4.54.

Table 4.52 Placencia recommendations for improvement

Recommendation(s)	% respondents suggesting the recommendation(s)
More consultation/more encouragement in the community	52
More advertisement on FON's work	12
No comments	36

Table 4.53 Hopkins recommendations for improvement

Recommendation(s)	% respondents suggesting the recommendation(s)
More consultation/more encouragement in the community	59
More advertisement on FON's work	3
No comments	38

Table 4.54 Monkey River recommendations for improvement

Recommendation(s)	% respondents suggesting the recommendation(s)
More consultation/more encouragement in the community	53
More advertisement on FON's work	7
No comments	40

Other recommendations included:

- Let the fishermen know about new rules
- Meetings with the villagers
- Comments boxes can be put in public places

4.6 Rules

The respondents were asked whether they knew about marine protected areas in the area. Of the Placencia respondents 41% knew or had at least heard about them, 45% in Hopkins and 14% in Monkey River. Of the Placencia respondents 41% believed that these marine protected areas were beneficial to Belizean marine resources, 44% in Hopkins and 15% in Monkey River. The respondents were also asked whether they were aware of rules related to commercial fishing, recreational fishing, tourism fishing, mangrove use, reef use, hotel development, residential development, snorkel and diving rules, beach use rules and marine protected areas rules. The results are summarized in Table 4.55.

Table 4.55 Percent respondents aware of rules related to coastal and marine environment

Coastal and marine activity	Placencia	Hopkins	Monkey River
Commercial fishing	38%	49%	13%
Recreational fishing	42%	44%	13%
Tourism fishing	44%	41%	16%
Mangrove use	42%	44%	14%
Reef use	34%	53%	13%
Hotel development	38%	48%	14%
Residential development	42%	44%	14%
Snorkel/diving	36%	50%	14%
Beach use	36%	53%	7%
MPA	41%	43%	15%

5 CONCLUSION AND RECOMMENDATIONS

At present, Placencia, Hopkins and Monkey River are totally dependent on marine based tourism and fishing as a source of income. The preservation of these resources is crucial for the subsistence of these families. FON has initiated a strong foundation through consultation and education of the importance of these resources in these communities. The results of this study show that the communities are willing to support co-management efforts by FON.

A third to a half of the households in all three communities depend upon fishing as a source of income. The rest are somehow involved in a tourism-related activity as a source of income. Most households who depend on fishing as their primary source of income also depend on some aspect of tourism-related business. The households who have a tourism-related activity as their primary source of income also depend on fishing as a secondary or tertiary source of income.

The majority of the respondents believe that the present marine conditions have declined when compared five years ago. In every single household, the more fathers than mothers, sons or daughters were members of organizations. The three communities noted that economic more than educational or other benefits were obtained as a result of development.

In Placencia and Hopkins, less than 50% of the respondents believe that the community can work together to solve community problems and that fishers can work together to solve problems in the fishery. A little more than 50% of the Hopkins respondents believe that the community can work together to solve community problems and that fishers can work together to solve problems in the fishery. The three communities however believe that both the government and the people should work together to solve problems in the fishery.

Of the three communities, Placencia respondents were more aware of FON and their work. Hopkins respondents were more aware of FON than Monkey River respondents. The three communities however recommend more consultation by FON. Although these communities depend on fishing for income and subsistence, fifty percent or less knew about the rules related to the coastal and marine environment, especially rules related to fishing. The traditional homes that can be found in these three communities are tin roofs, wooden walls, wooden shutters and cement floors.

The majority of the respondents own land and a house. Being coastal communities, it is not surprising that the majority of the respondents in all three communities own a boat. More boats than cars are owned in all three communities. With regards to other household items, Placencia respondents own more household items than Hopkins and Monkey River. FON has done many things that have worked well in the communities. Among these are the scholarship project, and awareness/education projects with fishermen, tour guides and primary school children. Some of the respondents had resentments towards

FON as they felt FON was taking away their fishing grounds. For this, FON can probably do more education projects such as educational brochures about conservation and educational videos. Some of the respondents felt FON was not doing enough patrols in their fishing areas and they felt that this has allowed the Honduran fishermen to slowly invade their grounds. FON's interests in patrols are the protected areas they are co-managing. The Fisheries Department along with FON should consult with these communities and implement a patrol force for these areas.

Overall, the majority of the respondents claim to support FON and want to be more involved. This may illustrate FON's effectiveness in implementing education projects in the communities. One of the weaknesses of this assessment was that some of the survey questions might have discouraged the respondents from answering accurately. For instance, when asked whether they owned a boat, a family in Hopkins was concerned if FON's High School Scholarship to their child would be taken away if they said they owned one (meaning that they could somehow afford for their child's education). Another respondent wondered if the Fisheries Department would implement more regulations when asked about what were his sources of income, he said he owned a boat and went fishing everyday but never knew about the rules related to fishing (he was a fisherman as many lobster traps were seen behind his house).

The three communities are dependent on marine resources to survive and are to some extent aware of the importance of preserving it. Co-management is the way to go. FON however needs to go ahead and involve these communities to a second level. Based on the information gathered and the results produced in the socioeconomic assessment of the three fishing communities, the following recommendations need to be considered.

Future support and assistance from fishermen depends on better communication between FON and the fishermen in the three communities. This can be done through an awareness program designed for fishermen only. In this program, awareness about FON, co-management, FON's activities must be included as well as reef conditions, impacts of fishing and tourism on the reef, and the importance of conservation and marine protected areas. Fishermen make up the majority of the stakeholders in these resources, their impact on the resources is therefore the greatest, and their impact on decision-making is crucial in order to gain their support. Many of these fishermen claimed not to know anything about Friends of Nature other than they were there to close fishing grounds. If informed about the biological studies conducted by FON and presented with the present conditions of the reef, the rate of decline in fisheries exports will provide a clear picture to these fishermen about the need for protection and that FON is there to help. Some fishermen perceive that the two protected areas are there for tourism only. The protected areas however do provide multiple use zones for them. In this zone, these fishermen are allowed to fish in a sustainable manner. Fishermen do not seem to be aware of these zones. This leads them to illegally fish in the protected zones and create conflict with park rangers. This lack of awareness is attributed in part to poor communication between the FON and fishermen. FON needs to develop programs that will allow fishermen not have this feeling that only tour guides are benefiting from the parks. FON needs to make them have this feeling that because these protected areas are in the south of Belize, nobody but them (the communities) have the responsibility for conserving these resources.

In awareness and education programs to these fishermen, FON needs to educate them about value of conservation of marine biodiversity and surrounding habitats as well as other values of the reef such as social, cultural, and economic values. The use of case studies from the same villages can enhance these awareness programs. (Bunce and Gustavson, 1998).

FON should ensure the users of the coastal resources become aware of the benefits of socioeconomic benefits. The better these people understand that less deteriorated reef conditions means more economic benefits to them, the more they will appreciate and support FON's conservation efforts. Some of the fishermen and the majority of the tour operators in these three communities have an idea about these benefits. This is the opportunity for FON to enhance their knowledge about these benefits. The hotel and restaurant operators have some appreciation of conservation and are aware that tourism is there because of the beauty of these marine resources. FON can take this opportunity to work along with these businesses and help them implement best practices in their businesses such as small environmental

management programs in their hotels. This can be an advertising tool for the businesses and at the same time will allow the business owners to have a better appreciation of conserving the environment. Respondents that worked under the government or private enterprises such as banks, showed very little or no interest in reef conservation and the benefits of it. As one respondent noted, “I work in the bank whole day, I reach home tired, don’t need to care about the fishes.” FON can also help these businesses by advertising the businesses that are “eco-friendly” to the tourists that visit the protected areas FON is co-managing. FON can probably set up a membership program for these businesses, train them on environmentally friendly practices and present them with a certificate at the end. FON can work along with the Belize Tourism Industry Association and the Belize Tourist Board to accomplish this.

In Belize, many traditional fishermen have shifted from commercial fishing to tourism ventures, these can not only be noted in the southern coastal communities but also in the outer cayes. Some fishermen work on both commercial fishing and tourism ventures such as tour guiding and tourism businesses such as hotel or restaurant owners or tour operators. It will be more difficult to change the attitude of the commercial fishermen who are still in the business and are still not aware of the benefits of reef conservation. As previously mentioned, they need to become educated but they can also be provided with alternate occupations such as those in the tourism business.

It is also very important to get the users of these resources involved. As many of the respondents noted, they are willing to participate in decision-making. Once they are involved, they will have a feeling of responsibility towards the conservation and management of these resources. Involvement brings about more input and information that may have not been noted before. Involvement can reduce conflict between user groups, as the concerns of each group will be considered before final decisions are made. User group involvement does not have to be in formal settings such as in meetings, but can be in informal settings as well. FON can place suggestion boxes in the three communities such as at the post office, at the police station, and at the village council office. Involvement can get specific user groups to get committed to a specific project. For instance, FON can request certain members of the community to volunteer to serve as park rangers on their free time or to report on any illegal activities in the part. In this way, these people will be committed to management. FON can get community members involved in collection of biological data to get them involved as well.

As can be seen in the socioeconomic report, it is not only the communities that affect the reef but also distant activities such as pollution from the fish farms, shrimp trawlers, and natural disasters. FON should coordinate efforts to get these organizations or individuals to participate in management as well. They also have a stake in the management of these resources.

Finally, Friends of Nature establish a socioeconomic monitoring programme to monitor changes in the communities. I also recommend that in the very near future FON should conduct Socioeconomic Assessments in the other two communities that were not studied (Independence and Seine Bight). Fishing communities are dynamic and continually adapting to change thus changing the social and economic landscape continually.

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7 APPENDIX I Household Interview questionnaire for FON project

Household Interview questionnaire for FON project.

Date and time _____ Name of respondent _____
 Interviewer _____ Respondent # _____
 Location _____

Demographics

1. How many people live in this household? _____
2. How long has this household been located in the community? _____
3. What are the 3 most important occupations of household members in order of the amount of income generated.
 1^s. _____, 2nd. _____, 3rd. _____
4. What is the household's primary, secondary and tertiary most important sources of income?
 1st. _____, 2nd. _____, 3rd. _____
5. Are any females living in the household involved in an income-generating activity?
 Yes _____ What activity? _____
 No _____
6. Is any member of this household a member of a formal and/or informal organizations?
 Yes _____ Who? _____ What organization? _____
 No _____ Who? _____ What organization? _____
7. How would you describe the condition of marine resources five years ago? very good ___ good ___ not good not bad ___ bad ___ very bad ___.
8. How would you describe the conditions of marine resources today? very good ___ good ___ not good not bad ___ bad ___ very bad ___.
9. (For non-fishing households) On average, how many days a month does the household fish to supply food?

10. What marine recreational activities do members of the household engage in on a regular basis?
 _____, _____

Friends of Nature

11. Are you familiar with Friends of Nature?
 Yes _____ No _____
12. What do you think is the main purpose of Friends of Nature?

13. What 2 things do you think Friends of Nature has done that have worked well?
 1. _____, 2. _____
14. What 2 things do you think Friends of Nature has done that have not worked well?
 1. _____, 2. _____.
15. What 2 things do you think Friends of Nature can do to improve their work regarding coastal/marine management in the community?

1. _____, 2. _____.
16. Do you know who is the representative of Friends of Nature in the village?
Yes _____ No _____
17. Are you consulted on decisions made by Friends of Nature?
Yes _____ No _____
18. To what extent can you participate in decision-making by Friends of Nature?
Full active participation ___ active participation ___ some participation ___
little participation ___ no participation ___.
19. What two things would you suggest that Friends of Nature could do to improve participation in decision-making?
1. _____, 2. _____.
20. Do you think that the people in your village can work together to solve community problems?
Yes _____ No _____
21. Do you think that fishermen can work together alone to solve a problem in the fishery?
Yes _____ No _____
22. Should the government, the people or both, work to solve a problem in the fishery?
government only _____ people only _____ both _____

Rules.

23. Do you know of any Marine Protected Areas (MPA) in the area?
Yes _____ No _____
24. If yes, is the MPA beneficial to Belizean marine resources?
Yes _____ No _____
25. Are you familiar with any rules and regulations related to:
Commercial fishing _____; recreational fishing _____; tourism fishing _____;
Mangroove use _____; reef use _____; hotel development _____; residential development _____;
snorkel/diving _____; beach use _____; MPA _____.

Threats and problems.

26. What are the top three major **threats** to the community?
Threats: 1. _____, 2. _____, 3. _____.
27. What are the top three major **problems** for the community?
Problems: 1. _____, 2. _____, 3. _____.
28. What do you think are the possible **solutions** to these problems?
Solutions: 1. _____, 2. _____, 3. _____.
29. What are the top three major **threats** to the marine resources?
Threats: 1. _____, 2. _____, 3. _____.
30. What are the top three major **problems** for the marine resources?
Problems: 1. _____, 2. _____, 3. _____.
31. What do you think are the possible **solutions** to these problems?
Solutions: 1. _____, 2. _____, 3. _____.
32. Are you obtaining benefites as result of development in the area?
Yes _____ What benefites _____
No _____

Material style of life.

33. Does the household have:
Own land _____ own house _____, boat _____, car _____, washer _____, VCR _____, cell phone _____, TV _____,
stereo _____, refrigerator _____, stove _____.
- Type of roof: tin _____ thatch _____ cement _____ shingle _____
Type of outside structure of wall: wood _____ cement _____ plywood _____
Windows: wooden shutters _____, metal shutters _____, glass shutters _____, glass _____
Floors: cement _____, wood _____, tile _____, dirt _____, carpet _____

8 APPENDIX II Excel Coding Scheme

Excel Coding Scheme

Resp #	Village	HHsize	Hhcomm (yrs)	HHocc1	HHocc2
HHocc3	HHinc1	HHinc2	Hhinc3	HHfish	HHrec
Feinc	Feincact	HHorg		Orgwho1	Orgwhat1
Orgwho2	Orgwhat2	Orgwho3	Orgwhat3	Orgwho4	Orgwhat4
Rescond5	Rescond	FON	FONpurp	FONwell1	FONwell2
FONnotwell1	FONnotwell2	FONimp1	FONimp2	FONrep	FONcons
FONpar	FONimpport	FONimpport	Villtogh	Fishsol	Comgt
MPAknow	MPAben	Rules1	Rules2	Rules3	Rules4
Rules5	Rules6	Rules7	Rules8	Rules9	Rules10
Rules5	Rules6	Rules7	Rules8	Rules9	Rules10
Commthreat1	Commthreat2	Commthreat3	Commprob1	Commprob2	Commprob3
Commsol1	Commsol2	Commsol3	Marthreat1	Marthreat2	Marthreat3
Marprob1	Marprob2	Marprob3	Marsol1	Marsol2	Marsol3
Devben	Devbenwhat1	Roof1	Roof2	Roof3	Roof4
Wall1	Wall2	Wall3	Win1	Win2	Win3
Win4	Win5	Floor1	Floor2	Floor3	Floor4
Floor5	Land	House	Boat	Car	Washer
VCR	Cell phone	TV	Stereo	Frig	Stove