

**Survey of SocMon-Related Sites
(Sites Conducting Socioeconomic Monitoring related to the Global
Socioeconomic Monitoring Initiative)**

**Social and Economic Profile of Helene;
Community Views on the Environment and the
Potential for a Successful MPA.**



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This study forms part of a NOAA & Coral Cay Conservation research initiative entitled:

“Integrating Biological and Socio-economic Studies for the Effective Conservation of the St Helena Region, Bay Islands, Honduras”

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LIST OF ABBREVIATIONS

AFE-COHDEFOR	Administración Forestal del Estado Corporación Hondureña de Desarrollo Forestal (Department of Forestry)
BICA	Bay Islands Conservation Association
CBM	Community-Based Management
CBNRM	Community Based Natural Resource Management
CCC	Coral Cay Conservation
DCS	Decompression Sickness
DIGEPESCA	Dirección General de Pesca y Agricultura (General Department of Fishing and Aquaculture)
GEF	World Environmental Fund (Germany)
IDB	Inter-American Development Bank
MPA	Marine Protected Area, used as the equivalent to a ‘Parque Marino’ under Honduran Law – a multiple use, zoned marine protected area.
NBIPLA	La Asociación de Profesionales y Trabajadores Isleños Native Bay Islanders Trade and Labour Association
NGO	Non-Governmental Organisation
PMAIB	Proyecto Manajo Ambiental De Las Islas De La Bahia (Environmental Management Project of The Bay Islands).
SERNA	Secretary of Environment and Natural Resources

1. EXECUTIVE SUMMARY

Environmental resource management has traditionally focused on the biophysical aspects of conservation, through restrictive access and a ‘preservation’ mentality. This perspective perhaps goes some way towards explaining why only 6% of the Marine Protected Areas designated in the Caribbean can be classed as ‘successful’. The purpose of this project was to undertake a socioeconomic audit before proposals are developed for marine conservation and sustainable livelihood enhancement in Helene in the Bay Islands, Roatan, Honduras.

The study indicates that people on Helene will support an MPA if it creates more employment opportunities. With fishing as the most important economic activity there is an assumption that changing to new work activities will become necessary. Thus problems could develop, as already 41% of the adult population is non-wage-earning. The possibility that an MPA could enhance fish stocks was not a widely held view despite the fact that older fishermen were critical of some current fishing practices such as harvesting gravid fish.

Diving as a fishing method is seen as a hard way to make money so other options would be welcomed by at least some islanders. The farming of conch and lobster was seen as an attractive option.

People see the extension of tourism to Helene as inevitable: most respondents support this form of development

With the introduction of fishing restrictions people may migrate back to farming and this could put greater pressure on forest and mangrove resources.

There is some disillusionment with Government, as initiatives seldom seem to reach Helene. With this background, the people see a community-managed MPA as the only way forward. Nevertheless, training and financial assistance from the Government will be needed to help set-up the system. Plans for diversification of job opportunities will be essential. After that, community-based management has the potential to foster an attitude of stewardship through a process that is truly participatory. Only if this is done will the environmental gains be achieved.

Grant Awarded to:	Coral Cay Conservation
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Editor:	Dr Simon R Draper, srd@coralcayconservation.com
Location:	Santa Helena, Roatan, Bay Islands, Honduras

Project Award Number: NA05NO54631018

2. INTRODUCTION

Environmental resource management has traditionally focused on the biophysical aspects of conservation, through restrictive access and a ‘preservation’ mentality. This perspective perhaps goes some way towards explaining why only 6% of the Marine Protected Areas designated in the Caribbean can be classed as ‘successful’ [1]. More recently conservation scientists are coming to understand that in order for conservation to be truly effective, the ‘human factor’ must be included in management strategies. Communities attitudes towards, and uses of, coastal resources have serious implications on the health of coastal systems, and in turn, the quality of the environmental resource base has equally serious implications on the sustainability of the communities reliant on it. Indeed it is humans that are responsible for the majority of environmental stressors and humans that have the ability to alleviate, through successful management, these impacts. Charles Birkland argued in a recent issue of BioScience [2] that “much of the research on coral reef damage has focused on its proximal causes...rather than its ultimate causes, the increasing human population and associated economic demands”. He concludes that a more proactive management strategy is imperative to protect reefs as this “can be accomplished only by clarifying the entire economic picture.” Many of the failures of coastal management can be attributed to a lack of understanding of and participation by communities. Coastal management must balance the sustainable use, protection and conservation with the communities need for food security, livelihood and equitable access to resources.

i. Location Specific Background

The Bay Islands are a site of significance for biodiversity conservation, as part of the Mesoamerican Reef System which includes one of the world's largest barrier reefs, several atolls, extensive mangrove forests and sea grass beds, seabird-nesting islands and coastal wetlands.

These crucial resources are greatly at risk from anthropogenic impacts linked to unsustainable use of marine resources, and rapid modernisation in the region. Around 60% of Honduran reefs are at risk, mainly from over fishing, bleaching and sedimentation due to forest clearance and agricultural run-off [3]. Irresponsible tourism activities are damaging the reefs in the West Bay-Sandy Bay region of Roatan. Most native forest areas and mangrove have already been lost to logging and clearing for agriculture. There is an urgent need for conservation of the marine and terrestrial environments of the Bay Islands, from the perspective of local livelihoods as well as ecology.

In response to this situation the Honduran Ministry of Tourism created the 'Programa Manejo Ambiental de Las Islas de la Bahia' (PMAIB: Program for the Environmental Management of the Bay Islands), an environmental body, funded by the Honduran Government, GEF and an IDB loan, to address these concerns. PMAIB has among its stated aims:

1. To protect and restore natural resources and coastal and marine ecosystems by establishing an integrated management strategy.
2. Institutionally develop and strengthen local capacity to plan, use and manage the economical exploitation of the natural resources.
3. To improve local people's conditions and quality of life by improving drinking water supply, implementing basic clean-up and drainage facilities and preserving marine ecosystems.
4. To initiate the establishment of mechanisms to recover public investments in the environmental sector, and generate financial resources and incomes to support the sustainable development of the Bay Islands.

In 1997, PMAIB began technical research into designating the Bay Islands as a protected area [4]. Within this large, environmentally regulated zone, 12 smaller protected areas were proposed; six marine and six terrestrial. Management plans for each area have been created and PMAIB are currently guiding the essential legislative framework through Congress so the parks will have the necessary legal status and support [5]. These management plans, including the plan for Santa Helena (Helene) and Barbareta, are publicly available for viewing at: www.islasdelabahia.org [6].

PMAIB will be the body responsible for implementation and generating community support.

PMAIB completed preliminary fisheries and socioeconomic surveys in 2004 [7-11] which began the process of understanding the significance of fisheries for local environments and incomes, and to define the level of interest of local communities in alternative livelihoods such as tourism. This work needs to be taken further to develop a fuller understanding of these communities and their perceptions of conservation and development in order to develop a successful integrated, community-based resource management plan for the area.

ii. The Study Site

Roatan is an island of stark contrasts; from the luxury dive tourism and commercial centres on the west side of the island, to the relatively undeveloped east side, that relies on fishing and shipping. Santa Helena (referred to as Helene) is a small island off the eastern tip of Roatan, separated from the rest of the island by a 5 km strip of mangroves, and is home to 642 English speaking afro-Caribbeans. Helene lacks basic infrastructure, formal institutions and government support. This isolated community is semi-autonomous and not currently under the influence of any formal coastal management initiatives. This situation offers the rare opportunity to collect ‘before’ data: an uncommon occurrence in the Caribbean [12]. Communities on the island are heavily dependant on fishing but have limited access to markets or processing facilities. Species-specific, intensive fisheries such as the lobster, snapper, grouper and conch fisheries are overly relied upon and hence declining populations have forced employment diversification. The area surrounding Helene has been targeted as the site for a proposed MPA because it is considered one of the most pristine marine environments in the Bay Islands/Roatan area. However, the impacts of fishing, and waste and effluent discharge on the marine environment are affecting the health of the system and management is needed to ensure use of this resource base remains sustainable [13]. The communities in this region remain extremely poor, and generating employment opportunities and development infrastructure in Helene remain the local priority.

iii. How Project fits into Existing Management Strategy

PMAIB is the main implementing agency charged with the identification, formulation and regulation of Marine Reserves in the wider Bay Island region of Honduras. The management plan for the Bay Islands is in the final stages of development, and CCC has already contributed to this process through the provision of biological survey data on the surrounding environment. However, the socioeconomic elements of the current plan are largely based on PMAIB's informal understandings of the issues facing local communities. A fundamental socioeconomic baseline of data for the area was lacking, as was the provision for a long term socioeconomic monitoring system to evaluate the effect of the proposed MPAs on local communities. Both PMAIB and CCC are keen to see a more formalised inclusion of socioeconomic work in order to develop a truly adaptive management strategy for the proposed MPA. This type of work had not previously been carried out in Helene.

NOAA recently published the “GCRMN Socioeconomic Manual for Coral Reef Management” [14] complimented by, “Socioeconomic Monitoring Guidelines for Coastal Managers in the Caribbean” [15]. These publications provide for a standardised approach for analysing social and economic factors relating to environmental resource management, at the study-site level. A previous socioeconomic study by Wiefels, 2000 employed a purely quantitative approach [9]. The SocMon methodology allows for a balance between qualitative and quantitative data collection, adopting a more formal and recordable approach, which is comparable at national, regional and international level with other sites. Qualitative inputs are important to truly involve stakeholders and adequately represent the diversity of views on a very small scale [16-17].

Socioeconomic monitoring work can contribute to the successful implementation of the proposed MPA in many ways. The information collected through SocMon provides a baseline of socioeconomic data, from which changes can be measured and the progress of management strategies determined, which is highly desirable prior to implementation of plans for Marine Protected Areas. Information on economic activities of Helene can be used to determine which social groups will be most

affected by the proposed MPA. A comprehensive social survey can generate data on community attitudes towards conservation in general and specifically, towards the proposed MPA. PMAIB will be able to use these data to construct targeted socialisation programs to improve the effectiveness of the MPA. A SocMon framework also provides the basis for PMAIB to develop a long term social monitoring plan.

It has been noted by CCC field staff that previous community consultation, by PMAIB and other government bodies, has been limited to a few individuals who are not felt to truly represent the community's views as a whole. By engaging every household on the island, the SocMon has been able to independently capture the range and breadth of opinions / perceptions more accurately than any previous assessment.

3. SOCMON GOAL AND OBJECTIVES

i. Goal

A socioeconomic study of Helene completed according to *SocMon* guidelines. The study incorporates:

- i. An economic and demographic profile of the community
- ii. An understanding of community interactions with, and views on, the marine environment
- iii. An understanding of the community's opinions on, and capacity for participation in, the proposed management scheme.

ii. Objectives

- To provide a set of baseline socio-economic data that PMAIB can use to develop a holistic environmental management plan for the Helene and Barbarella region and a benchmark by which future progress can be evaluated.
- To contribute socio-economic data to regional databases aiding understanding of the broader ecological and socio-economic conservation issues of the Caribbean.
- Capacity building with the community and PMAIB to aid effective implementation of a management plan.
- To provide management recommendations related to the potential social and economic impacts of the proposed MPA.

iii. Expected Outputs

1. A social-economic study of the Helene region completed according to SocMon guidelines.
2. A report provided to PMAIB including the findings and how they can be incorporated into management strategies for the proposed MPA
3. Workshops delivered to the local community to disseminate the findings and canvas local opinion on the results.
4. Capacity building with the community on Helene and PMAIB towards sustaining a long term monitoring programme which could be used to evaluate the progress of the proposed MPA.
5. Report made available to other interested parties, subject to NOAA's agreement, to contribute to global understanding of local community dynamics in the Caribbean.
6. Report distributed to CCC HQ and staff at other expedition sites with a view to expanding socio-economic surveys to other locations.

iv. Future Objectives

1. An integrated biological and socioeconomic data set which can be used by PMAIB towards the development of a holistic environmental management framework for the Helene and Barbarella region.
2. A procedural framework for development of an integrated social and biological monitoring programme at other CCC survey sites.

4. METHOD

i. Project Design

The SocMon methodology for conducting socio-economic analysis and profiling was adopted for use in Helene as part of a sustainable management planning for introduction of a marine reserve [15]. SocMon can be broken down into 6 key phases: 1) preparation activities, including identifying the goals and selecting the relevant variables; 2) data collection through secondary sources; data collection through key informants; 4) data collection through surveys; 5) data collected through observation; and 6) data analysis, communication of the results and adaptive management (Figure 1).

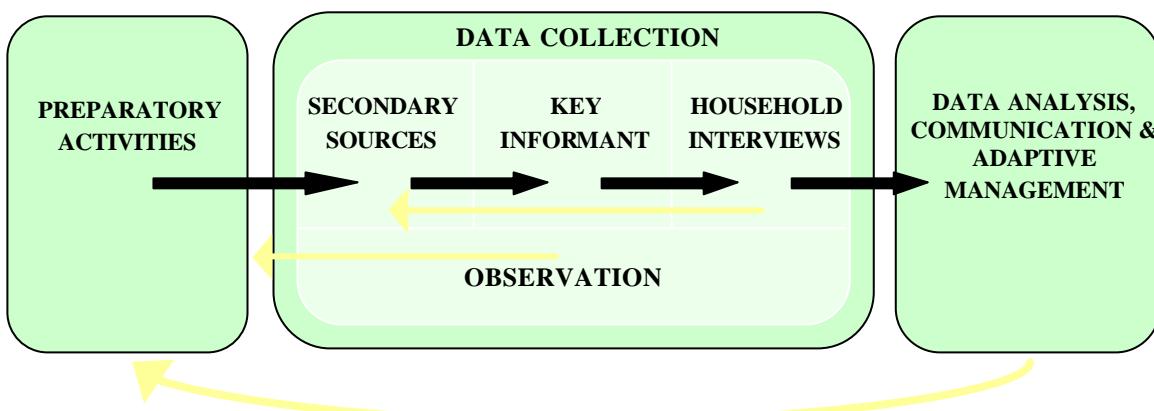


Figure 1: The Six Key Phases of a Socioeconomic Monitoring Programme, taken from Bunce, 2004.

Five months of field work (sourcing secondary data, conducting the interviews and discussion groups) was completed from 01.01.06 – 25.05.06. There were five people on the study team; one consultant and four part time survey assistants (Appendix B). Data analysis and completion of the report required a further three months, based in the UK.

Data Collection:

- Household interviews (population census) to obtain Islanders' occupation, source of capital, age, level of schooling, languages, religion, perceived community problems and business development ideas.

- Secondary resources from existing research, studies and reports.
- Key informant interviews.
- Systematic random household surveys. The survey design was discussed and amended through consultation with the local island council. Areas covered include:
 - Community and household demographics
 - Main occupations in the community
 - Economic profile including; activities, goods, services and market orientation
 - Community infrastructure
 - Coastal and marine activities
 - Perceived coastal management threats, problems and solutions
 - Perception of resource condition
 - Community and stakeholder organisations
 - Perceived community problems
 - Formal and informal tenure and rules

Copies of the questionnaires can be found in Appendix A.

A pilot questionnaire was designed and tested on a small number of people, in addition to being discussed and improved by individual members of the island council, before being used in the study. As many of the variables as possible were incorporated into the questionnaires so the baseline data would be as comprehensive as possible. Seven out of sixty variables were not included due to site-specific irrelevance, collection difficulty or time constraints (Tables 1 & 2).

ii. Survey method

Surveying was random based on a representative sample from each village rather than identified stakeholder groups. A list of names was drawn up from the initial

demographic profiling and then every 3^d name selected, in total 121 people. Not everyone was available or wanted to answer the questions so a total of 101 surveys were completed, 28% of the adult population. The majority of interviews were conducted at the respondent's home, other interviews took place: at sea; the Coral Cay base and in the pub.

iii. Level of Community Participation

The study was semi-participatory in nature. Community involvement in the questionnaire design and the responses from the pilot study highlighted additional areas for research that were incorporated into subsequent questionnaires. People from Helene directly contributed to the study as household informants and trained survey assistants conducting household interviews. Two 'discussion days' at the beginning and end of the fieldwork, allowed for additional comment and reaction to the SocMon. Preliminary findings were relayed throughout the process and the final results are to be disseminated through a newsletter style report, which should open the discussion to a wider audience. Participation was constrained by: peoples' interest in the subject; their ability to carry out the surveying in the method required; technical constraints to data entry and analysis (no IT access) and the available time. All semi-structured key informant interviews, data entry, analysis and report production were undertaken by the consultant.

Table 1 & 2: Goals of socio-economic monitoring and relevant variables surveyed

GOALS	KEY INFORMANT INTERVIEWS / SECONDARY SOURCES VARIABLES													
	Community-level demographics													
	Study area	Population	No. of households	Migration rate	Age	Gender	Education	Literacy	Ethnicity	Religion	Language	Occupation	Community infrastructure and business development	Activities
Identify threats, problems, solutions and opportunities														
Threats	★		★	★	★			⊗					★	★
Problems														
Solutions and Opportunities														
Determining the importance, values and cultural significance of resources and their uses														
Importance/Value													★	
Cultural significance														
Building stakeholder participation and appropriate education and awareness programs														
Stakeholder Participation			★		★	★	★	⊗	★	★	★	★	★	
Awareness Program					★									★
Verifying and documenting assumptions of socioeconomic conditions in the area, community dynamics and stakeholder perceptions	★		★	★	★	★	★	⊗	★	★	★	★	★	★
Establishing baseline household and community profile	★		★	★	★	★	★	⊗	★	★	★	★	★	★

Table 1

<u>Key</u>
★ Variables relevant to each goal included in the study.
⊗ Relevant variable not included in study due to site-specific irrelevance, collection difficulty or time constraints.

KEY INFORMANT INTERVIEWS/SECONDARY SOURCE VARIABLES																	
Coastal and Marine Activities										Governance							
Goods and services	Types of use	Value of goods and services	Goods and services market orientation	Use patterns	Levels and types of impact	Level of use by outsiders	Household use	Stakeholders	Tourist profile	Management body	Management plan	Enabling legislation	Management resources	Formal tenure and rules	Informal tenure and rules, customs and traditions	Stakeholder participation	Community and stakeholder organisations
K15	K16	K17	K18	K19	K20	K21	K22	K23	K24	K25	K26	K27	K28	K29	K30	K31	K32
★	★			★	★	★											
				★			★										
								★									
									★							★	
										★						★	
											★					★	★
★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	⊗	★	★
★	★	★	★	★	★	★	★	★	★	★	★	★	★	⊗		★	★

Table 1 continued...

	SURVEY VARIABLES													
	Household demographics							Coastal and marine activities						
	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	K13	K14
GOALS														
Identify threats, problems, solutions and opportunities														
Threats											★	★	★	
Problems							★							
Solutions and Opportunities								★						
Determining the importance, values and cultural significance of resources and their uses														
Importance/Value							★		★				★	
Cultural significance														
Building stakeholder participation and appropriate education and awareness programs														
Stakeholder Participation	★	★	★	★	★	★	★					★		
Awareness Program	★	★	★	★	★	★	★		★	★	★	★		
Verifying and documenting assumptions of socioeconomic conditions in the area, community dynamics and stakeholder perceptions	★	★	★	★	★	★	★	★	★	★	★	★	★	★
Establishing baseline household and community profile	★	★	★	★	★	★	★	★	★	★	★	★	★	★

Table 2

SURVEY VARIABLES														Material Style of Life	
Attitudes and Perceptions															
K15	K16	K17	K18	K19	K20	K21	K22	K23	K24	K25	K26	K27	K28		
Non-market and non-use values	Perceptions of resource conditions	Perceived threats	Awareness of rules and regulations	Compliance	Enforcement	Participation in decision-making	Membership in stakeholder organisations	Perceived coastal management problems	Perceived coastal management solutions	Perceived community problems	Success in coastal management	Challenges in coastal management	Material style of life		
K15	K16	K17	K18	K19	K20	K21	K22	K23	K24	K25	K26	K27	K28		
★	★	★						★	★	★					
			⊗	⊗							⊗		★		
★						⊗	★								
			⊗	⊗		⊗	★				⊗	★			
★	★	★	★	⊗		⊗	★	★	★	★	⊗	★		★	
★	★	★		⊗	⊗	⊗	★	★	★	★	⊗	★		★	
★	★	★		⊗	⊗	⊗	★	★	★	★	⊗	★		★	

Table 2 continued...

5. RESULTS

The results of the SocMon study are summarised in two sections, mirroring the layout of the SocMon handbook, which will simplify comparison with any future monitoring or adapted management strategy. Section one contains the results from the key informant and secondary source variables and Section two summarises the survey variables. An additional part has been added to both sections covering the established MPA in Roatan and attitudes and perceptions towards the proposed MPA on Helene.

N.B.

Throughout the analysis the word ‘community’ is used to refer to the spatial unit of the study area. No attempt is made to enter the debate on the definition of ‘community’ or the applicability of the concept to natural resource management [17-18].



KEY INFORMANT INTERVIEWS / SECONDARY SOURCE RESULTS

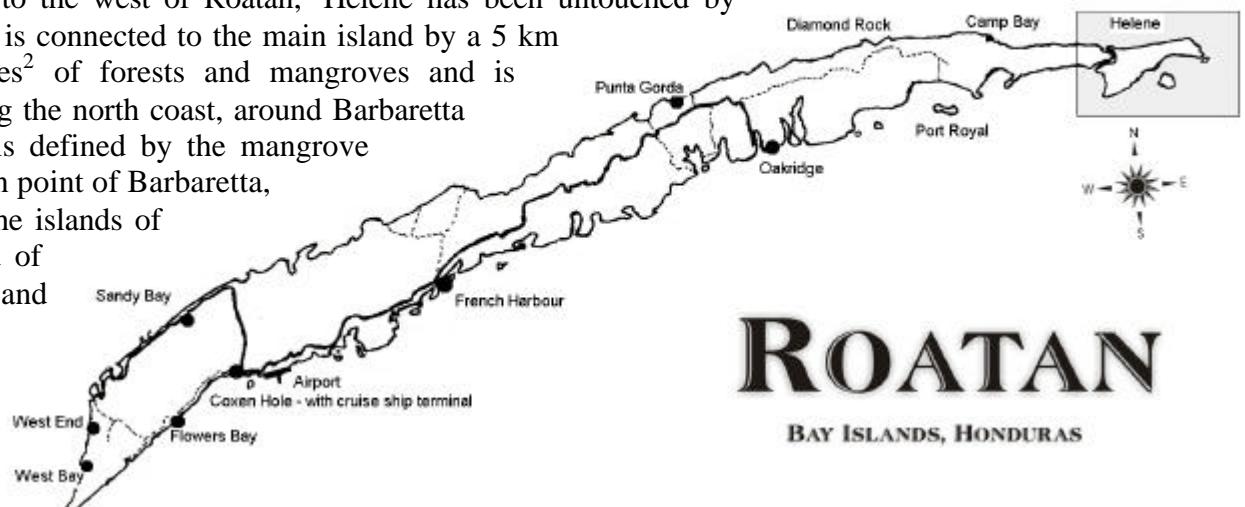
COMMUNITY LEVEL DEMOGRAPHICS

K1. Study Area:

The Bay Islands, ringed by coral reefs of the Mesoamerican Barrier Reef System, stretch in an arc between 29 and 56 kms off the Honduran mainland and consist of three main islands: Utila, Roatan and Guanaja. The Bay Islands economy, which up until the 1970's was based on traditional, artisanal and commercial fishing, is now reliant on a mix of tourism, fishing and real estate, intimately tying it to global markets for goods, labour and capital [19]. Over the last decade, pressure on coastal resources has risen dramatically: land is cleared for development leading to erosion and sedimentation; mangroves are cleared, water quality has decreased from effluent and waste run-off; over fishing and natural phenomena such as coral bleaching and hurricanes (1998 Hurricane Mitch). The majority of the resorts and dive centres are owned by foreigners and the perceived standard of living difference has encouraged heavy migration of unskilled/low skilled labour from the mainland, increasing the divide between rich and poor.

Administratively and politically, Roatan, the largest of the three islands, is divided into two municipalities: Roatan in the west and Jose Santos Guardiola in the east. Tourism is concentrated on the western side of the island at West End and West Bay (Figure 2). The West End / Sandy Bay Marine Reserve is located here, as are the majority of hotels and dive resorts. Travelling east, Coxen Hole is the capital, home to Roatan's financial institutions as well as a cruise ship dock and the island police. French Harbour is an important port for commercial and industrial ships. Punta Gorda is a traditional Garifuna fishing community and at the end of the tarmac road is Oakridge. Over the years Oakridge has fallen into decline as the fish processing plants moved away and the banks closed. Transport in and around Oakridge is by boat which is the main link to the SocMon study site of Helene. In stark contrast to the west of Roatan, Helene has been untouched by tourism probably due to its isolated location. Helene is connected to the main island by a 5 km stretch of mangroves. The island covers 2.5 miles² of forests and mangroves and is surrounded by a fringing coral reef that stretches along the north coast, around Barbarella Island, and back along the south. The study area is defined by the mangrove channel on the western side and stretches to the eastern point of Barbarella, encompassing 7 villages and 5 islands (Figure 3). The islands of Morat and Pigeon Cays are uninhabited. The island of Barbarella is privately owned, undeveloped and unoccupied for the majority of the year.

Figure 2



K1. Study Area: Map of Study Area (Figure 3):

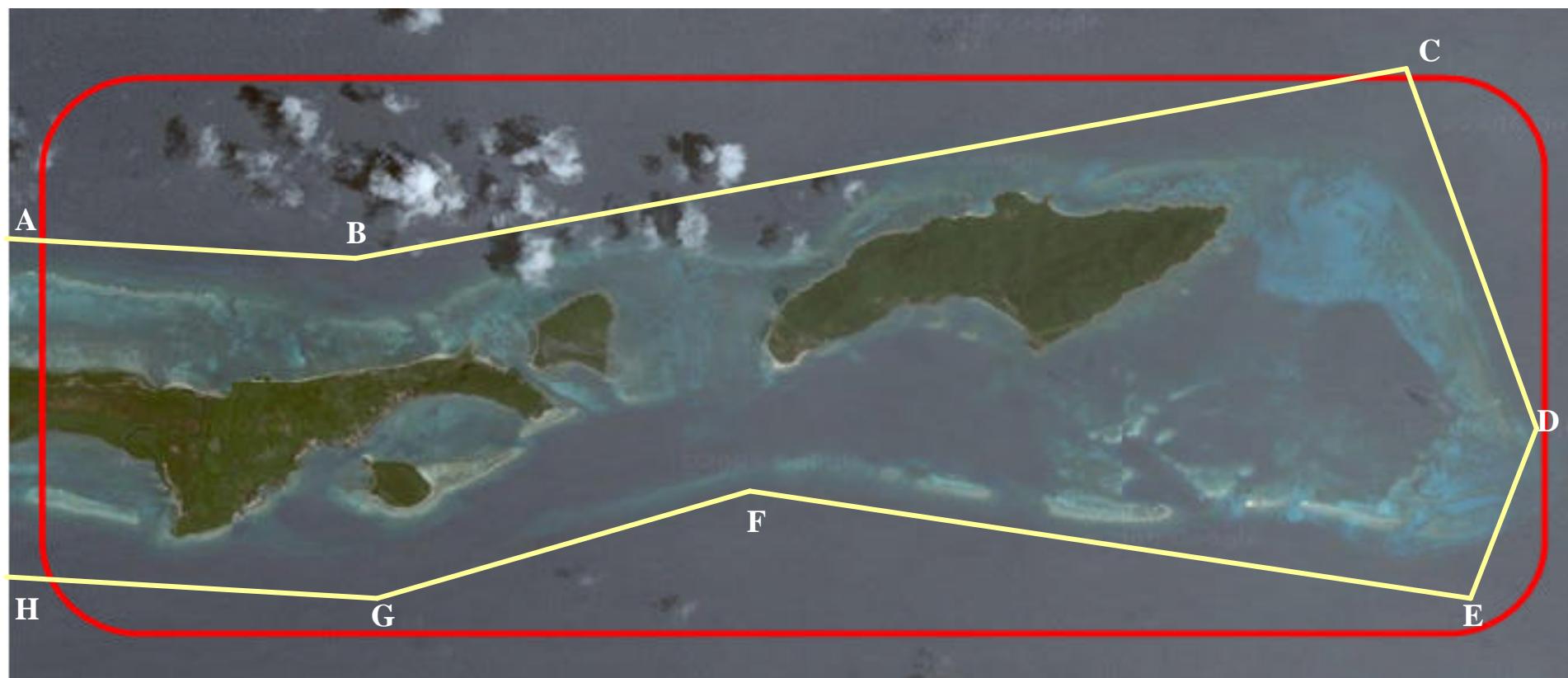
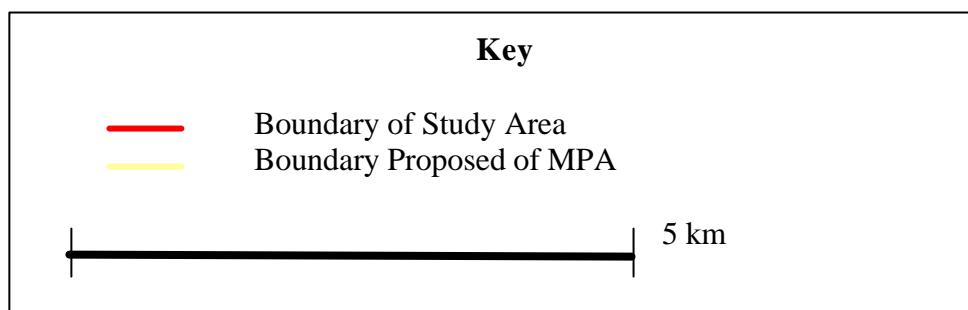


Figure 3 (Courtesy of Yahoo.com)



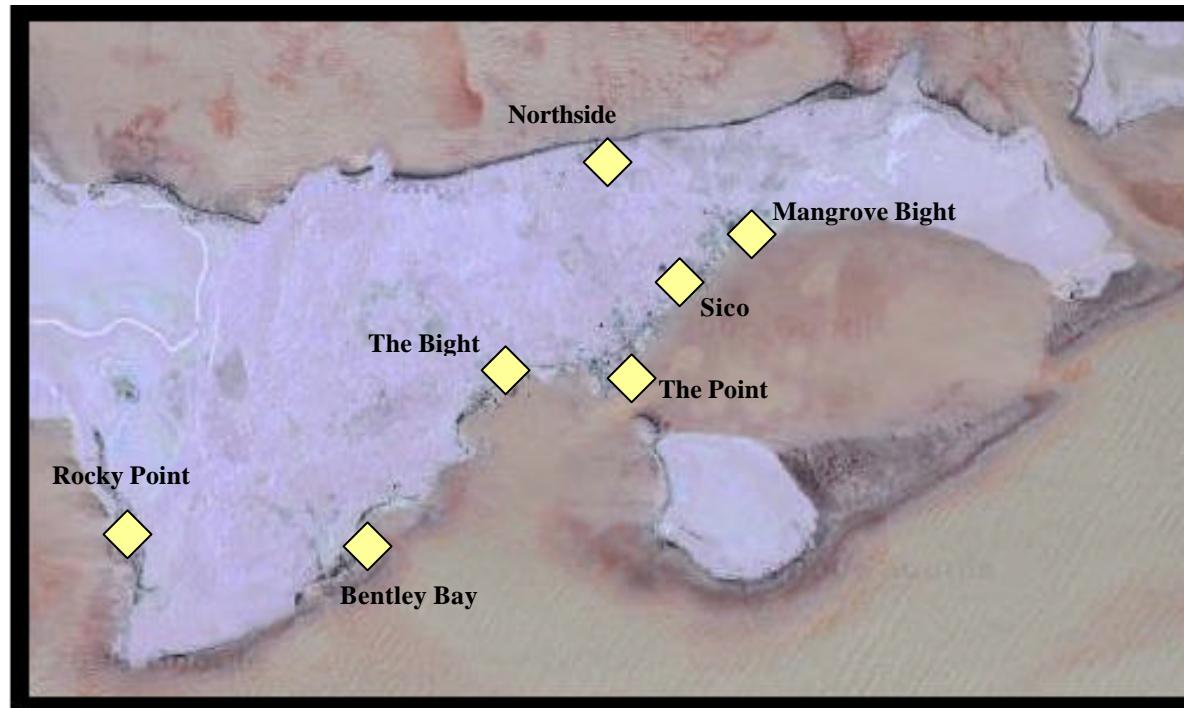
Boundary Corners of the Proposed Santa
Elena-Barbareta Marine Reserve

Point	Longitude	Latitude
A	578342	1817814.72
B	584277	1817802.77
C	595792	1820782.00
D	597559	1815553.93
E	596852	1813646.38
F	588092	1813928.98
G	584135	1813363.77
H	578483	1813787.68

K1. Study Area: Villages

Located on the most westerly point of Helene, **Rocky Point** and **Bentley Bay** are the most isolated in terms of services. Rocky point has 4 houses; only one occupied all year round. Large plots of land here have been sold to foreign buyers that are yet to be developed. Bentley Bay is an extremely tidy and pretty village; heavily reliant on fishing, especially tank diving for income. The village is almost entirely one large family and has recently expanded, with 6 new houses built on cleared forest land.

The Bight is the largest of the villages and is arguably the capital of Helene. Some of the wealthier land owners and business men reside here. The Bight has a compressor, shop, football pitch, gas station and restaurant.



Village	Population	Number of Households	People per Household
Rocky Point and Bentley Bay	96	20	4.8
The Bight	137	26	5.3
The Point	93	25	3.7
Sico and the Pond	99	21	4.7
Mangrove Bight	98	20	4.9
Northside	119	19	6.3

Figure 4

Northside is a strong fishing community with its own small school group and the only beach on the island. The weather and reef topography on the north coast make fishing opportunities unpredictable.

Mangrove Bight is a collection of houses on stilts built on cleared mangroves. Waste is dumped in the mud outside the houses. Mangrove Bight has a gas station.

Sico and the Pond is one of the most recent settlements with a young, rapidly growing population. Sico is the location of the Spanish School, two restaurants, a shop and the fish trader. Most of the drink and drug related social problems are concentrated here. The Pond is the poorest area in Helene. The main public pier is located on **The Point**. The Point has the least number of people per household (Figure 4) and this quiet village is where the new hotel developments are being planned. The American Mission with its clinic and desalination plant is also situated on The Point.

Key Demographics		
K2. Total Population: 642* people		
Adults**: 364	(57%)	
Children: 278	(43%)	
K3. Total Number of Households: 131*		
Average household size: 5		
Average number of earners per household: 2		
K4. Migration: Net outward migration		
K5. Age:		
0-15	43%	
16-30	28%	
31-50	21%	
Over 51	8%	
Average age: 23 yrs		
K6. Gender:		
Male	49%	
Female	51%	
K7. Education:		
Average number of years education*: 8 yrs		
Average age people leave education: 13.5 yrs		
K9. Ethnicity:		
Black Bay Islander	98%	
Spanish	1%	
Moskita, Garifuna, other Caribbean, European and American	<1%	
K10. Religion:		
57% of adults consider themselves religious.		
100% of those are Protestant Christian:		
Pentecostal	23%	
Methodist	43%	
Universal Church of God (NS)	15%	
Adventist (BB)	16%	
Evangelical	<1%	
K11. Language:		
Spanish as first language	2%	
English and Spanish bilingual	59%	
English and basic Spanish	21%	
English only	18%	
Other languages including: Garifuna; Portuguese and Miskito	<1%	

* Not everyone on the island was present for the demographic census (living abroad / jail). 4 houses were unavailable for interview and have not been included including the owner of Barbarella who resides in the USA. 97% present.

** 16 years and above

Community Demographics:

Helene is populated by English-speaking Afro-Caribbeans of mixed Cayman Island / English decent who have been living in the Bay Islands for around the last 150 years. The population is made up almost entirely from 5 family groups. More recent settlers moved from Port Royal two generations ago and established the village of Sico. Since then migration to Helene has been strictly discouraged by the community, especially with regard to 'Spaniards' (from the Honduran mainland).

With a rising population the amount of out-migration has risen. 44% of the 60 families surveyed named at least one family member that had migrated away from Helene in the last year (Appendix C). People move away to find work, live with other family members (Roatan, La Ceiba and the US) and to study.

Having received little Government support and lacking any formal institutions the island is semi-autonomous. The police and government officials are not welcomed, however, many people still vote in local and national elections; voting split between the National and Liberal parties.

K12. Occupation:

The working population of Helene is 188 people (Table 3). 43% of these people also named a secondary occupation. 36% of the population work as fishermen and in total 45% of the working population is dependent on fishing as all or part of their income. Other smaller employers include construction (usually down island) restaurants, shops, small self-started businesses, sport, work with the church and fishing on commercial / industrial fishing vessels.

As well as housework, secondary occupations are usually taken on by women to supplement the family income and include: baking, hair braiding and jewellery making.

Illegal work, such as drug running, poaching, illegal hunting and sand mining, was not included in these results but is covered in survey variable S7.

Major occupations in the community	% of working population conducting this as primary occupation	Number of people conducting this occupation as primary occupation	% of working population conducting this occupation as secondary occupation	Level of dependence on each occupation (% primary + % secondary)
1. Fishing*	36	67	9	45
2. Construction	11	21	1	14
3. Services: chef; waitress; laundry	10	19	1	12
4. Vocation: teacher; nurse; midwife	7	14	1	12
5. Sport: football / basketball	6	11	1	11
6. Small business: shop; restaurant; gas station	6	11	6	8
7. Small misc. business: hair; baking; handicrafts; coconut oil	6	11	8	7
8. Other <3%	18	34	15	34

Table 3

* Fishing encompasses both of the primary fishing methods used on Helene, “tank diving” and line fishing. Although there would have been value in separating these methods into different categories both have been grouped together due to the significant overlap between the two. The method used depends on the weather, gear availability, and fishing season.

Unemployment stands at 41%. This is examined further in section S7 and in the discussion.

COMMUNITY INFRASTRUCTURE AND BUSINESS DEVELOPMENT

K13. Community, Infrastructure and Business Development: community infrastructure that exists in the study area (Table 4)

Infrastructure	Description	Business Development	Description
Schools	1 Kindergarten 1 Government sponsored Spanish school; 2 teachers, open AM only. 1 Private Christian mission sponsored school; 4 teachers, open PM only. 1 recently established community college: 1 teacher, 19 pupils. Children sometimes travel to other schools/colleges in Oakridge, French Harbour or Coxen Hole depending on how much the family can afford.	Food Shops	2 Shops selling limited fruit, vegetables, tins and meat. 7 basic food supply 'pulperias' run from peoples' houses.
Resident Doctor	No Occasionally there is a volunteer doctor from the mission.	Restaurant	3– 1 in The Bight and 2 in Sico.
Resident Nurse	Mission volunteers: 2 qualified staff nurses, can be up to 8 on a semi-permanent basis. 4 local midwives (untrained)	Gas Station	2 – Mangrove Bight and the Bight Waterside gasoline suppliers for boats
Hospital	No	Bank	None
Medical Clinic	Basic clinic run by the Mission	Speciality shops	None
Electricity	Helene is not connected to the Roatan electric grid. Electricity is produced via private generators. Individuals' own generators that supply electricity for a group of houses (maybe up to 7). There is one large generator supplying the whole village of the Bight. Approx. 25% of houses do not have their own electricity supply. A small number of houses have installed solar panels.	Gift Shop	None
Telephone	No land lines. Mobile signal in some areas. Not widely available.	Dive Shop	None

Internet Access	No public access. The Mission has a satellite system in place for private use.	Tour Operator Fishing Guides Guesthouses / hotels / inns / resorts Additional services: Pool hall, 2 bars and a disco in Sico. Compressor (for filling diving tanks) in The Bight.	None
Water supply to homes	Approx. 50% of households are supplied directly by a pipe system using ground water from wells. There are 6 wells. Bentley Bay is heavily reliant on rain water.		No official guides – most people would act as a guide if there was anyone to show around.
Sewage treatment plant	None. Sewage is discharged directly into the sea. A tiny percentage of houses have a septic tank.		2 under construction – 1 on The Point and 1 on Barbarella in the planning stage
Newspaper	None		
Television	Approx. 70% of houses.		
Ice plant	No. Ice is produced by some in personal freezers and sold via the shops.		
Hard top road access	No. Access via boat only.		
Radio	Yes, short and long wave.		
Banking	None		
Restaurants	3 – 1 in The Bight and 2 in Sico.		

Table 4

Health – Dr Scott, Paramedic at the Mission Clinic

- On average there is 1 accident and 1 trauma a week. 5 people a month are referred to Coxen Hole for tests / further treatment.
- 14 babies born in the last year. No infant mortalities. Improved prenatal care has reduced problems.
- HIV /AIDS estimated at 10% of the population – no tests are currently available.
- Malaria and Dengue Fever are prevalent.
- Most common complaints are: acute abdominal pain in woman and diet related illnesses especially diabetes (as a result of the high carbohydrate diet).
- The clinic has 10 home patients and 3 that require complete care.
- Fishing related injuries include; cuts from hooks, bites, coral stings, and the occasional decompression sickness from diving.
- Equipment required in order to improve basic service: laboratory for blood tests, ultrasound and x-ray machine.

Box 2

Helen has 1km of path (unsuitable for motor vehicles) that runs the length of the south side of the island and over the hill to the Northside. This path connects the 7 villages and is maintained by a team funded through private Christian sponsorship. Public boats (4 per week) link the community to the nearest town of Oakridge and private transportation is required to access the closer villages of Camp Bay, Diamond Rock and Port Royal. The services at Oakridge include: gas stations, large hardware and food suppliers, the local government offices, small police unit, restaurants & bars as well as taxi and bus services to French Harbour, Coxen Hole and West End. To get to Coxen Hole from Helen takes approximately an hour and a half by boat and taxi and costs (if travelling in a group) 130 Limps (\$7) one way. A fresh water supply has been connected in three villages on Helene via donation of funds from an NGO. The rest of the island extracts water using buckets, from communal wells, and drinking water can be purchased from a desalination plant owned by the mission, or transported from Oakridge. Helene is not connected to the national telephone or electric company lines. The survey indicates that 85% of households have electricity, many of them sharing from a neighbours' generator. There are no waste disposal facilities or collection service: household waste is dumped or burnt. A nearby uninhabited mangrove island is being used as an illegal landfill site. There is also no sewage treatment system and most sewage is discharged directly into the sea.

COASTAL AND MARINE ACTIVITIES

K14-19. Activities, Goods and Services, Types of Use, Value of Goods and Services, Goods and Services Market Orientation and Use Patterns: Coastal and marine activities is the identification of the uses of coastal and marine resources. These may include activities directly or indirectly using or affecting the coastal and marine resources (Table 5).

Coastal & Marine Activities	Coastal & Marine Goods & Services	Types of Use (primary)	Value of Goods & Services (L = Limpera)	Goods & Services Market Orientation (primary)	Use Patterns
Line Fishing (weather dependent e.g. hurricane season)	Marlin, Barracuda, Groupers, Snapper, Grunt, Silverfish, Goggle eye, Tuna, Jack, Mackerel, Queenfish, Wahoo, Shark, Bonito, Squid, Turtle	Small-scale, artisanal and subsistence fishing. Mostly drag trawling with line or long lining, cast nets (for bait), boat: canoe, dori or lancha with outboard engine (15 hp up to 40hp)	20L a pound for fish or 10L a pound for small reef fish (bycatch). Medium	Local and regional. Fish and shellfish are sold locally to intermediaries that sell on to Oakridge & French Harbour.	Lagoon and reef around Helene. North East Elbow and South East – around Barbarella. Occasionally the Honduran fishing banks.
Fishing with Scuba and free diving (weather dependent)	Conch, Lobster, Shells, Grouper, Snapper	Small-scale, artisanal and subsistence fishing. Scuba, speargun	40L a pound for lobster. 20L a pound for finfish Conch and lobster are high value	Local and regional. Fish and shellfish are sold locally to intermediaries that sell on to Oakridge or French Harbour.	Lagoon and reef around Helene. North East Elbow and South East – around Barbarella. Occasionally the Honduran fishing banks.
Construction	Housing, animal shelters, piers, sea defence.	Constructed by hand Sand Wood Land clearance	Medium	Local	Local
Transport	Passenger transport service Goods transport	Dori Gasoline	70L one- way to Roatan. Low	Regional – to Roatan	Between Helene and Oakridge

Farming crops	Bananas, coconuts, yucca, plantain, cashew nuts, mangos, avocados, potatoes, crab apples, sweet potatoes, oranges, onions, peppers, water melon, sugar cane, cassava, pumpkin, beans, maize, chilli, tomatoes.	Cleared patch of jungle, water, machete, seeds.	From 1L for a plantain to 15L for an avocado Low	Mostly local, sometimes regional	Half a km inland, in the jungle.
Farming Cattle	Beef	Pasture	Low	Local	Western hills.
Sand Mining	Sand for building aggregate.	Spade and boat for transport.	Low	Local and regional	The island of Morat and Northside beach
Mangrove Clearing	Wood for pig pens and clearance for building. Some clearance to reduce mosquitoes and create a clear vista.	Machete	Low	Local	Morat, South Helene around to Rocky Point
Forest Clearing	Land for building / farming. Wood for carpentry / construction. 'Clean/tidy' environment. Access to wells and farmland.	Machete	Medium	Local	Helene, Morat, Barbarella (illegal)
Hunting esp. iguana, parrots and rabbits	Iguana, rabbits, parrots (deer in the past-none remain)	Slingshot, dogs, guns	Low	Local, sometime regional e.g. parrots	Barbarella, Morat and Helene forests
Tourism	Boat/island/fishing/diving tours.	Dori, guide	Nothing to whatever the tourists want to pay for a guide. Low	National and international	Reefs, harbours, villages
Drug Running	Marijuana, cocaine, crack, money	Boats	High	Local, regional, national and international	Guanaja, Helen Roatan and Mainland, all offshore
Coconut Oil making	Coconut oil for cooking	Coconuts, water, wood for fire	Low	Local and regional	All over
Waste Burning	Cleaning service	Waste	Low	Local	All over

Table 5

K14. Description of Main Coastal and Marine Activities in the Study Area: (Figures 5 & 6)

Line Fishing: Line fishing involves trawling a baited hook behind a moving boat and aims to catch the larger pelagic species such as tuna, bonito and barracuda. Most of the boats are 15hp doris / wooden canoes and fishermen may spend up to 14 hours at sea (on local grounds). Fishermen also long-line with multiple hooks for deep-sea species especially at night. Although many people do not fish as a primary income almost everyone relies on fishing during times of unemployment and need. Fishing is seasonal and can become dangerous or impossible during the squall season and hurricane season. Figure 4 displays more information on fishing grounds and fishing.

Speargun Fishing: “Tank divers” as they are known, use rudimentary SCUBA equipment and a simple speargun. Divers work in pairs; spearing fish, gutting the fish under water and filling them with air, so they float to the surface, for their partner in the boat to collect. Tank divers also use hooks to catch lobster and collect conch from the seabed. Tank diving is heavily restricted by the weather: visibility, currents and wave action. For more information on tank diving in Helene please refer to Williams, 2005 [17].

Construction: Traditionally houses are built on stilts, using wood, with zinc or tin roofs. More recently concrete houses are being constructed. Most of the construction jobs are small i.e. a housing for a generator, or, commissioned by foreigners, or, in Port Royal, Oakridge and Coxen Hole.



A typical Helene house in The Bight

Transport: Being an island, the coast is used primarily for transport of people and goods. People commute to work on Roatan, travel to Roatan to shop for food, clothes etc and use the banks and telephones. Boats are also used to transport building materials, drinking water and fuel for the island. Navigation to Oakridge is hazardous due to the narrow channels through the reef and the lack of any navigational aids.

Farming Crops: A small number of people grow a variety of crops for family and to sell locally. Few people claim to farm as their primary occupation, however, sugar cane and plantain are grown in most backyards.



Cattle grazing on the hills behind Bentley Bay

Farming Cattle: There are two herds of cattle (approx. 13 animals in each) that graze on the hills north of Bentley Bay. A smallholding of 5 cows is located on cleared mangrove between The Point and Sico. Cattle are reared for meat and slaughtered for special occasions. The majority of households rear chickens and / or pigs.

Sand Mining: Sand is used in construction to make up cement mixes. Sand mining happens on a small scale to supply the local demand in Helene and is also transported down the coast to hotel developments.

Mangrove Clearing: Mangroves are cleared for wood; to allow access to the sea; for land to build on and to allow the breeze that runs along the coast to cool the houses.

Forest Clearing: Forest wood is collected for carpentry, building houses and animal shelters. Food is usually cooked on a propane gas stove; one canister of propane lasts just under a week, so at the end of the week, wood is collected and used to bake bread. Some of the poorer households regularly do all the cooking using firewood. Forests are also cleared for building, for access paths (for example to farmland) and to 'keep the place looking tidy'. Over Easter some forests are burnt to aid the iguana hunt.

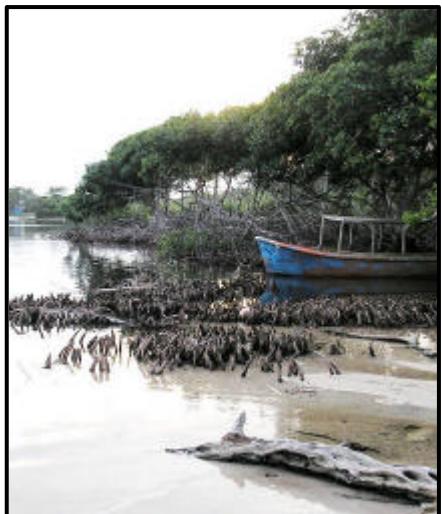
Hunting: Hunting for iguana, rabbits and parrots takes place all year round. Most young men hunt for pleasure rather than money. Iguanas and rabbits are hunted with dogs especially around Easter as iguana and iguana eggs are a delicacy cooked for Good Friday celebrations. Parrots are sold or kept as pets. Most boys learn how to hunt from a young age with sling shots and later progress onto guns. For poorer families it is an activity turned to in hard times to supplement the diet and provide extra income.

Tourism: Tourism is negligible on Helene due to its inaccessibility and lack of facilities (no accommodation). There is a Christian Mission which provides lodging to American volunteers that help with community projects. Boats coming up from West End pass Helene on the way to Pigeon Cays which is a popular place to go for the day, snorkelling and relaxing on the beach. Occasionally boats anchor near the Bight and somebody gives a tour of the island.

Drug Running: It is difficult to collect data detailing drug-running activities on the island, due to the illegal and secretive nature of the work. Employment can take the form of; fixing boat engines, driving boats, fixing mobile phones, organising deliveries and is a major source of income for many people on Helene. There are two separate industries: local distribution and sales, and international distribution. The Bay Islands are on the route for drugs produced in South America moving to markets in the US. This international distribution takes place on boats at sea or across land through the Misiko coast and La Ceiba.

Coconut Oil Making: Coconuts are chipped up using a machete and then grated. The shavings are squeezed in water through a muslin cloth. Wood is used to make a fire and the coconut water is boiled up. After boiling the mixture is left to cool and the oil spooned off and bottled. Coconut oil is widely used in Caribbean cooking. Making coconut oil is an activity undertaken by women: can be done in the home whilst looking after the children so it provides an important additional income.

Waste Burning: Organic waste is fed to the pigs and dogs, plastics are sometimes burnt and tins and metal are dumped in the mangroves. Rubbish dumped in the mangroves



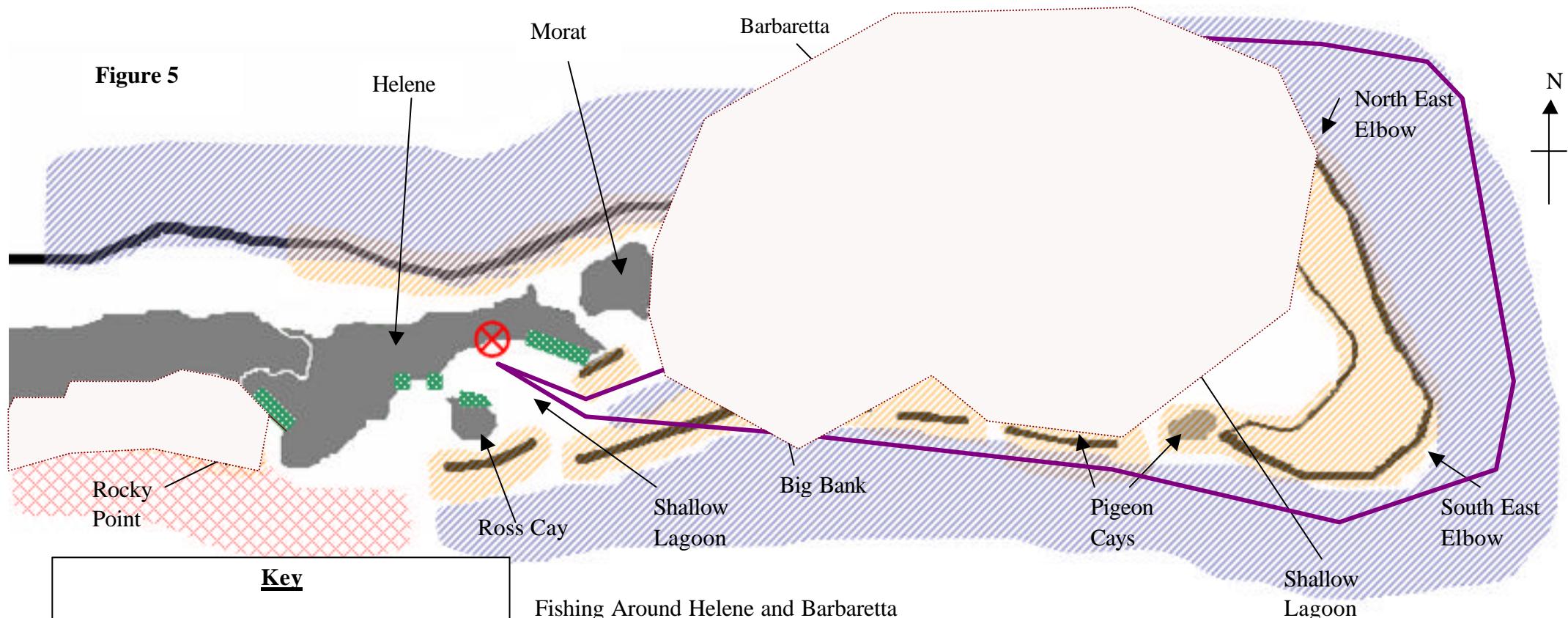
Cleared Mangroves



Children play with an iguana they have just caught



Rubbish dumped in the mangroves

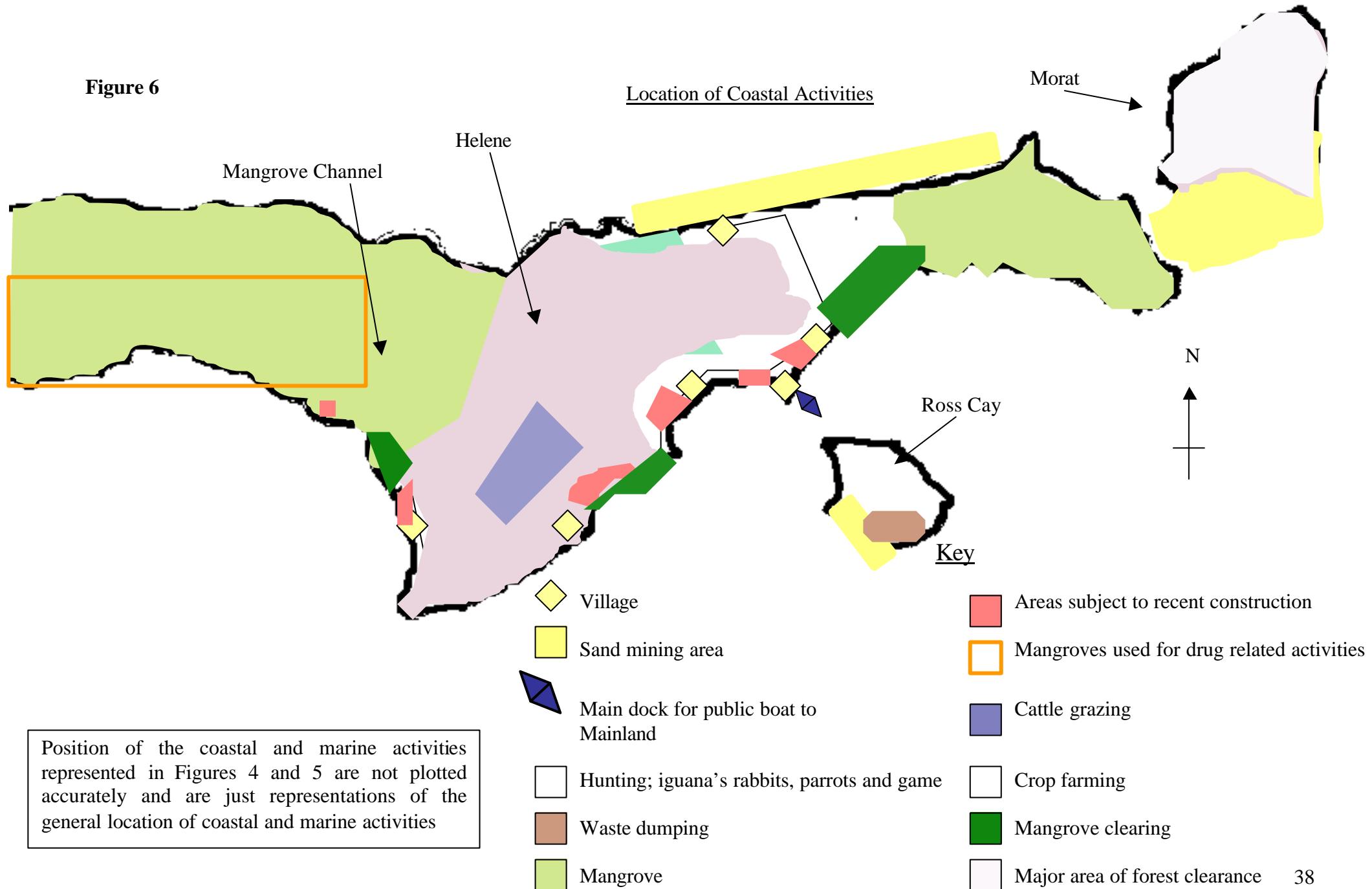
Figure 5**Key**

- **Reef Crest**
- **Area used for line fishing**
- **Area used for Speargun fishing**
- **Area not used for line fishing due to topography**
- ↔ **Main channel**
- ✗ **Fish Trader**
- **Line trawling path**
- **Restricted Fishing Zone**

Fishing Around Helene and Barbarella

Primary fishing gears are: the long line, speargun and lesser extent: hooked iron rods (for lobster); pots; gill nets and traps. Cast nets are used around the mangroves to catch bait. The fishing grounds around Helene and Barbarella are shared with the Garifuna community from Punta Gorda and occasionally fishermen from Guanaja. The most economically valuable species are conch and lobster (currently banned) and pelagic carnivores such as large tuna, kingfish and wahoo. Challenges facing the fishing community include: the hurricane and squall seasons, which make tank diving particularly difficult; market conditions and safety. Due to the unreliable and expensive electricity supply, keeping produce fresh is a problem. Fish are temporarily stored in cool boxes, with ice bought up from Oakridge and have to be transported to markets on Roatan as quickly as possible. The price of fish is low, reflecting the extra costs of storage and the significant expense in fuel to transport the fish. Fuel prices on Roatan are very high and the price increases as it is bought over to Helene. Some produce are sold locally, especially the conch and lobster which have a limited legal market outside Helene. There is one key fish trader, however, fishermen sometimes sell house to house. Another issue is safety at sea; most of the local boats do not carry a radio for communication or any form of safety equipment (first aid, life jackets). Tank diving is particularly dangerous and there have been a number of incidents over the year of DCI (Decompression Illnesses). The nearest recompression chamber is in West End, 2 hours away.³⁷

Figure 6



K 20-22. Levels and Types of Impact, Level of Use By Outsiders and Household Use:

Levels and types of impacts are measures of the perceptions of the general public, not a scientific assessment of the levels and types of impact (Table 6).

Coastal & Marine Activities	Level of Impact	Types of impact	Level of use by Outsiders	Household Use (primary)
Line Fishing (weather dependent e.g. hurricane season)	M	Over harvesting, Catching small fish	M	Sale and Own
Fishing with Scuba (weather dependent e.g. hurricane season)	H	Very few conch or lobsters around any more.	L	Sale and Own
Construction	M	Land and mangrove clearance Deforestation	L	Own and sale
Transportation	L	Gasoline use	M	Own, leisure and sale
Farming crops	L	Forest clearance Depends on weather – fresh water use	L	Own and sale
Farming Cattle	L	Escape and eating crops	L	Own and sale
Sand Mining	L	Beach erosion	L	Own and sale
Mangrove Clearing	M	Loss of mangrove services e.g. juvenile fish habitat and storm protection.	L	Own
Forest Clearing	M	Loss of resource – less wood to use, loss of shade.	L	Own and sale
Hunting esp. iguana, parrots and rabbits	L	Less parrots and iguana	L	Leisure, own and sale
Tourism	L	No impact at current levels	H	Sale
Drug Running	H	No environmental impact, high social consequences.	L	Sale
Coconut Oil making	L	No impact	L	Own and sale
Waste Burning	L	Smoke, smell	L	Own

Table 6

23. Stakeholders:

In Helene there are very few ‘stakeholder’ groups from outside the community that influence coastal management (Table 7); there are no active conservation or interest groups and Government regulations are largely ignored (e.g. mangrove cutting).

Coastal Activity	Stakeholder Group 1	Stakeholder Group 2	Stakeholder Group 3	Stakeholder Group 4
Fishing	Helene Fishermen	Fishermen from Mainland	Fishermen from Guanaja	Tourists - sport fishing
Transport	Dori owners	Passengers from Helene and Oakridge		
Farming	Helene farmers	Food Traders	Consumers	
Hunting	Hunters	Owner of Barbarella		
Drug Running	Drug runners	Police / Coastguard	Drug users	
Coconut oil	Coconut oil makers	Food Traders	Consumers	
Collecting shells for jewellery	Shell collectors	Buyers - tourists		
Collecting wood for carpentry	Carpenters	Construction Labourers		
Art	Artist	Buyers - tourists		

Table 7

K24. Tourist Profile:

In contrast to thousands of tourists that visit the West End of Roatan each year for diving and luxury holidays, Helene has very few tourists. This is probably due to the lack of facilities e.g. no accommodation and its remote location with infrequent transportation. Dive and sailing boats passing to Guanaja and Pigeon Cays sometimes stop for a couple of hours and the Mission caters for Christian volunteers that want to do community work. Tourism is expected to increase over the next couple of years; with a small hotel and dive centre planned on The Point and an upmarket resort under construction on Barbarella.

Cruise ships, one of the principal forms of tourism on Roatan, have been known to affect the environment in Helene by occasionally dumping waste plastics into the sea, which settle on the reef and wash up on the shore.

GOVERNANCE

K25 – 27. Management Body, Management Plan, Enabling Legislation:

PMAIB 'Programa Manejo Ambiental de Las Islas de la Bahia' (Program for the Environmental Management of the Bay Islands) is the main implementing agency charged with the identification, formulation and regulation of Marine Reserves in the wider Bay Island region of Honduras. PMAIB is part of the Honduran Ministry for Tourism and is funded by the Honduran Government and an IDB loan. The management plan for Santa Helena (Helene) and Barbarella is publicly available for viewing at: www.islasdelabahia.org [6] and contains a full description of the legislation and governing bodies in charge of coastal management in Helene and Barbarella.

Table 8, information collected from personal communication with PMAIB, 2006.

Coastal Activity	Management Body (s) (Yes/No) & Name	Management Plan (Yes/No)	Enabling Legislation (Yes/No)	Relevant Rules and Regulations (Yes/No)
Fishing	Dirección General de Pesca y Acuicultura- (DIGEPESCA/SAG)	Y	Ley de Pesca (No.154-1959) Reglamento General de Pesca (No.1098-01) Reglamento de Salud Pesquera y Acuicultura (No. 1418-00)	Banded fishing for lobsters, conch and shrimp. The waters surrounding Barbarella are a restricted fishing zone. Speargun fishing is illegal.
Mangrove Cutting	Dirección General de Pesca y Acuicultura- (DIGEPESCA/SAG)	Y	Ley de Pesca (No.154-1959) Acuerdo Ejecutivo (005-97)	Mangrove cutting is illegal and a permit should be obtained.
Fresh water Extraction	Dirección General de Recursos Hídricos (SERNA)	Y	Ley Aprovechamiento de Aguas (No.137-1927) Ley General del Ambiente (No. 104-93)	Y
Forest Cutting	AFE-COHDEFOR- SAG	Y	Ley Forestal (No.DL-85) Ley VOHDEFIR (DL-103) Ley de Incentivos Forestales (No.163-93)	Y

Sand Mining	Dirección de Fomento y Minería (DEFOMIN- SERNA)	N	Ley General del Ambiente (No. 104-93) Ley General de Minas (No.292-98)	Y
Shell Collection	SERNA AFE-COHDEFOR	Y	Zona de Conservación Ecológica de Islas de la Bahía (No.213-89)	Y
Aquaculture	Dirección General de Pesca y Acuicultura- (DIGEPESCA/SAG)	Y	Ley de Pesca (No.154-1959) Reglamento General de Pesca (No.1098-01) Reglamento de Salud Pesquera y Acuicultura (No. 1418-00)	Y
Tourism	Honduran Institute of Tourism	Y	Ley IHT(No.103-93) Ley Declaratoria de Zonas de Turismo (DL-968)	Y
Transport		N	Ley de Marina Mercante (167-94)	Y
Conservation	SERNA PMAIB	Y	Ley General del Ambiente (No. 104-93) Zona de Conservación Ecológica de Islas de la Bahía (No.213-89) El Acuerdo Ejecutivo (213-89) Acuerdo Ejecutivo (005-97)	Y

Table 8

K29. Formal Tenure and Rules:

Formal rules of the Government of Honduras apply to Helene but do not really influence life here e.g. Helene and Barbaretta are a designated restricted fishing zone and speargun fishing is illegal. There is very little awareness of environmental law with exception of the conch and lobster fishing restrictions. Conch and lobster are still caught and sold locally. Land tenure: the marine area is government owned and the terrestrial area is privately owned.

K30. Informal Tenure and Rules, Customs and Traditions:

Respondents found it difficult to supply any customs, traditions or informal rules during the interviews, although this does not necessarily mean they do not exist (Table 9). Further investigation into informal governance systems would be valuable.

Coastal Activities	Customs & Traditions	Informal Tenure Arrangements	Informal Rules
Line Fishing	No	Fishing groups were established a year ago to start a lobster aggregating project but have since fallen apart.	Fish spawning aggregations should not be fished (ignored) Young fish should be thrown back (ignored by some) Seine netting is not permitted (ignored by some).
Fishing with Scuba	No	No	
Construction	No	No	
Transportation	No	No	One dori captain acts as the main carrier between Helene and Oakridge and other boats have agreed not steal customers from him.
Farming crops	No	No	
Farming Cattle	No	No	Animals should be penned in so they do not disturb crops.
Sand Mining	No	No	
Mangrove Clearing	No	No	
Forest Clearing	No	Only on personal or common land	
Hunting esp. iguana, parrots and rabbits	No	No	
Tourism	No	No	
Drug Running	No	No	
Coconut Oil making	No	No	
Waste Burning	No	No	

Table 9

K31. Stakeholder Participation:

The community on Helene is not arranged into strong stakeholder groups and has no current coastal management system. Community problems are sometimes discussed by the Patronato (island council) and through church groups (Table 10). Helene is one large extended family and problems are dealt with by smaller family units rather than as 'a group of fishermen'.

K32: Community and Stakeholder Organisations :

Community Organisation	Formal or Informal	Main Functions	Influence (on coastal management; community issues; both; none)
Patronato (Island council made up of one elected representative from each village and any other interested parties).	Informal	The Patronato convene to discuss any island concerns. Its main function is to plan ahead, raise funds for community projects and settle disputes. One long term project involves finding clothes for the disadvantaged.	Community
Water Group	Informal	Finding funds and organising the instillation and running of the water pipe system, currently operating in 3 villages.	Community
Spanish School Group	Informal	Committee that helps run and raise funds for the Spanish school.	Community
College Group (new)	Informal	Organise funding, supplies and teachers for college.	Community
Church Groups	Informal	Variety of functions including running women's groups.	Community
Football Team	Informal	Started 10 years ago to give young people something constructive to do. Junior and senior teams play regular matches against other teams on Roatan and sometimes the mainland. Won the Roatan league this year. Sponsored by local Helene business man.	Community
Basketball Team	Informal	Started 2 years ago to give young people something constructive to do. Play regular matches against other teams on Roatan and Guanaja. Approximately 15 members	Community
Fishing cooperatives	Informal	Currently inactive. Was started in order to help improve fisheries management and initiate small-scale aquaculture .	Both.

Table 10

Members of the Patronato include; Victor James, Orvell James and Ray Forbes from Sico; Guillermo Hernandie and Elizabeth James from Mangrove Bight; Donnelly Rich and Cynthia Pandy from Northside; Miss Catherine from Bentley Bay; Elbert Rich and Wally Bodden from The Bight; Ezzard Bodden and Loretta Bodden from the Point.

MPA'S

The West End / Sandy Bay Marine Reserve is a MPA created on the west coast of the island. Key informant interviews and secondary data sources were used to build a small profile of the only example of this style of coastal management on Roatan. The Reserve was established in 1989, and extended in 1993 in response to perceived coral reef degradation potentially leading to loss of tourism revenue from over-fishing, anchor damage and careless divers. It was established by the local Municipality, the Governor of the Bay Islands, Ministry of Natural Resources and with private funding from Anthony's Key Resort (private development). The reserve, initially funded through BICA, ran out of money which led to a voluntary management committee being set up comprised of local business owners and other interested partners, primarily supported by a large donation from Anthony's Key Resort. Arguments over how the park was managed led to the current situation, where a local support group are attempting to run the park through a combination of dive tags (pay a fee for diving in the reserve), fund raising events and applying for money from companies that support conservation i.e. Reef Alliance sponsored some buoys. The Park now has a headquarters in West End and full time staff working on small projects with schools, litter clean ups and keeping the patrol boats running.

Points of note about the West End / Sandy Bay Marine Reserve

The, 'Community' is a large group of dive resorts, dive schools, restaurants and other tourist facilities that are primarily foreign owned and run [20]. Stakeholders are therefore very different from Helene which is a fishing community with limited financial means to support a MPA. The reserve was established with little participation and the resulting problems are still apparent: difficulties with enforcement, high enforcement costs, lack of unity between BICA and other user groups and a decision-making process that is not transparent or equitable [21-22]. The resulting increase in tourism has led to increased cost of living and problems with migration from the mainland. The West End / Sandy Bay Marine Reserve was set up and managed by, and for, the tourism interests in Roatan, there appears to be little real involvement of the local fishing communities in the management decisions taken, and as one local put it, "Traditional fishermen are now labelled as poachers". Anecdotal evidence suggests that the reserve appears to be having a positive impact at an ecological level, although the park was affected by the recent hurricanes and bleaching events.



The Marine Park Office



Cruise Ships Just off the Coast



SURVEY VARIABLE RESULTS

HOUSEHOLD DEMOGRAPHICS

S1-8. Age, Gender, Ethnicity, Education, Religion, Language, Occupation, Household Size:

A full census survey was conducted through the demographic household questionnaire for survey variables S 1-8 and the results are displayed in Table 1 in the Key Informants and Secondary Sources section. Occupational data has been further analysed in Table 11, below.

Occupation	PRIMARY		SECONDARY		Total % of community members engaged in this occupation (primary and secondary)
	Number of household members listed as primary occupation	Percentage household members that listed as primary occupation	Number listed as secondary occupation	Percentage household members that listed each occupation as secondary	
Fishing (line and tank diving)	67	18	17	5	23
Construction / Carpenter / Electrician	22	6	2	1	6
Services: chef; waitress; laundry	19	5	2	1	6
Vocation: teacher; nurse; midwife	14	4	1	0	4
Sport: football; basketball	11	3	2	1	4
Small Business: shop; restaurant; gasoline	11	3	12	3	6
Small Misc: hair; baking; handicrafts; art; coconut oil	11	3	15	4	7
Drugs	11	3	13	4	7
Boat Captain	10	3	0	0	3
Seaman	10	3	0	0	3
Farmer (cattle/crops)	7	2	6	2	4
Mechanic	7	2	6	2	4
Business / Tourists	5	1	8	2	4
Church/Mission	5	1	4	1	2
Abroad	4	1	0	0	1
Fish trader	1	0	0	0	0
No occupation (e.g. housework, students, retired and unemployed)	149	41% *	6	2	43
Total	364	100%	94		127%

* 31% 'Housework', 6% unemployment and 4% studying.

Table 11

Figure 7 shows the percentage of the community employed in each occupation:

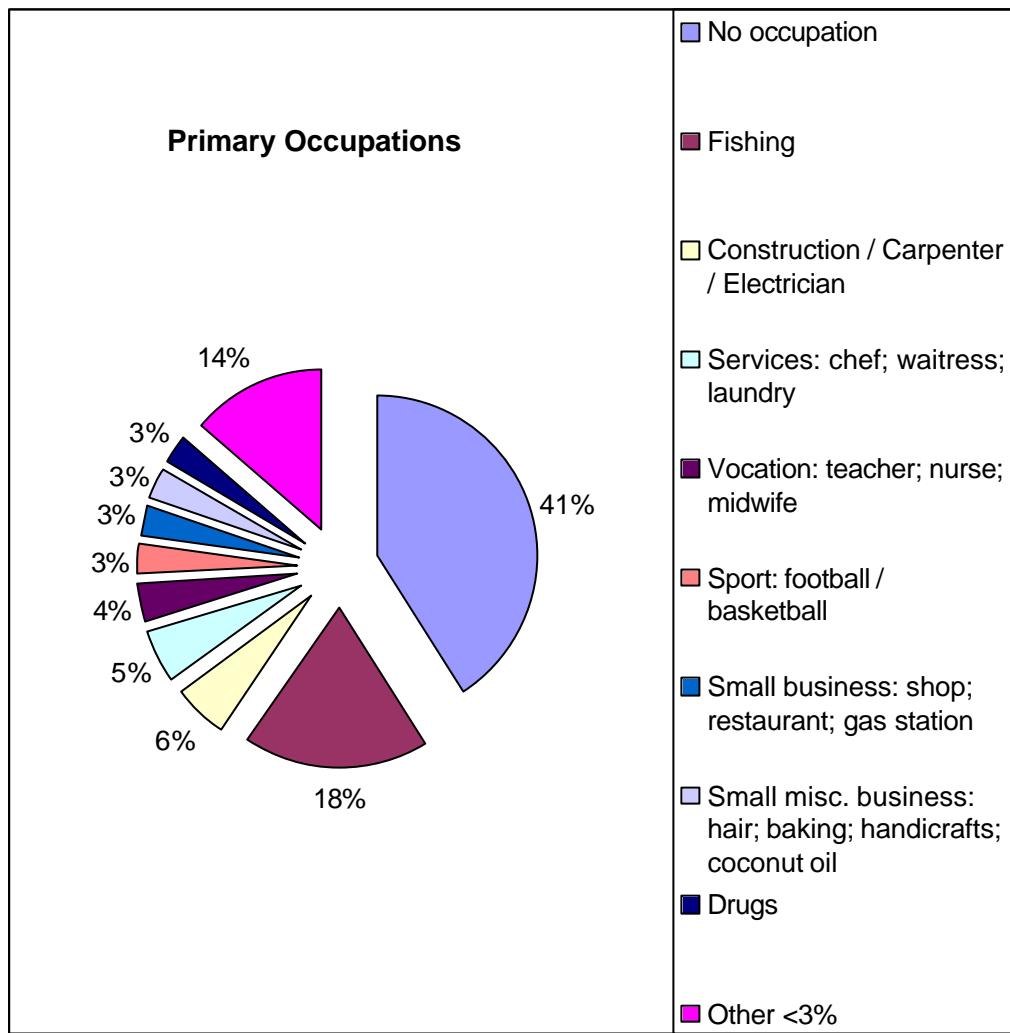


Figure 7

Characteristics of each Occupational Group:

Fishing: Solely male occupation, with workers from all age groups and educational levels

Construction: Solely male occupation divided into unskilled labourers and carpenters / builders. Jobs are assigned through contacts based on reliability and quality of workmanship. Limited work on Helene (more recently on Barbarella, most work is on developments in Port Royal, Oakridge and Coxen Hole).

Services: Mainly young women earning extra money for their family. Small market due to low amount of business development.

Vocation: High level of education, 55% over 9 years. Teachers are Spanish, trained on the mainland, midwives not formally trained.

Sport: Very athletic, talented Island with a high % of people going to play professional sport - football. Initially supported through drug money.

Small Business: Small enterprise from home selling farm produce / fish / gasoline to more established restaurants and shops with their own premises.

Small Misc. Business: Mostly run by women, from home, offering either goods from Oakridge (clothes etc.) or everyday services (hairdressing, baking). Low capital investment required

Drugs: Actual number of people employed in this industry is much higher. 91% of people are over the age of 26.

Mechanics: There are lots of young mechanics - a very useful profession on the island and can also find work in Oakridge and Guanaja.

Work at sea: Would have been the 3rd highest employer but Sea captains and Seaman were separated to reflect the amount of training necessary to become a Sea Captain. Helene has a strong naval heritage.

Farming: In the past there were more farmers but it is unpopular work with the young.

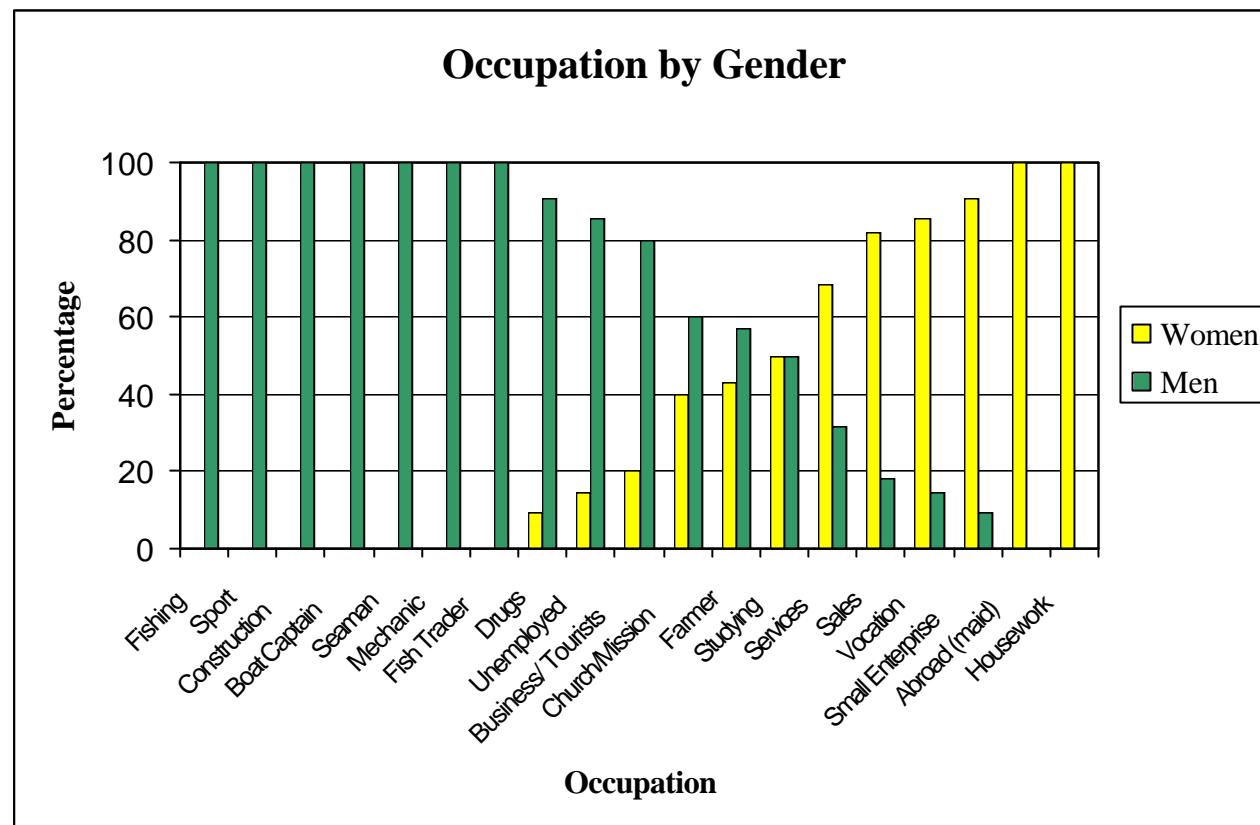
Occupation by Gender:**Figure 8**

Figure 8 indicates gender differentiated employment; housework and small enterprise are biased towards women, whilst fishing, sports, working at sea and mechanics are male dominated occupations. Housework is represented in this analysis due to the number of people involved, however this information is not comparable to the other entries in an economic sense because earns no money directly for the household. These qualitative results are not completely reflective of reality, for example, work abroad is carried out by both men and women; women as maids and nannies and men as painters, crew for boats and in tourism. Men that work abroad tend to live away for long periods of time, and were not considered by most households as a permanent member, so consequently have been underrepresented by the data. Some women line fish and fish trade as a secondary occupation or as part of a shop so the boundaries between occupations blur.

Occupation by Age and Education

Table 12 shows occupations relative to age and years of education.

Primary Occupation	PERCENT RESPONSES					
	Age 16-25	Age 26-45	Age over 45	< 6 Years schooling	< 6-9 Years schooling	> 9 Years schooling
Housework	42	44	14	4	71	25
Fishing	31	51	18	8	65	27
Unemployed	38	19	43	20	55	25
Construction	41	45	14	5	71	24
Services	47	37	16	0	63	37
Vocation	29	43	29	0	45	55
Studying	100	0	0	N/A	N/A	N/A
Sport	64	36	0	0	73	27
Shop / Restaurant / Gasoline	0	45	55	0	55	45
Small Enterprise	9	55	36	0	73	27
Drugs	9	64	27	0	90	10
Boat Captain	10	70	20	10	60	30
Seaman	10	60	30	0	70	30
Farmer (cattle/crops)	14	14	71	0	100	0
Mechanic	57	29	14	0	100	0
Business / Tourists *	0	100	0	0	60	40
Church/Mission *	40	20	40	0	80	20
Abroad *	25	75	0	0	100	0
Fish trader *	0	0	100	0	100	0

* Sample size < 5 people

Table 12

S9. Household Income :

Information from key stakeholder and anonymous household survey interviews, indicates an average monthly income between 1000 and 5000 Limpera (\$53 - \$213) a month, for a middle income family. Due to the sensitive nature of this subject, and with regard to the high amount of illegal activities supplementing income, this information was not requested as part of the household demographics questionnaire.

Table 13 shows an example of a household's monthly accounts:

A young couple (under 30): husband works in construction and fishes when he can not find work, his wife does housework, offers hairdressing and washes laundry. They have three children under 12.

Description	Price in Limpera (L)	Total per month
Expenditure		
Food	300 p/w	1200
Fuel for shared generator	100-200 p/d (5 days a week)	3000
Propane (gas cooker)	375 p/w	1500
School :		
Fee Kindergarten	100 p/m (8 days) x 1	100
Fee Spanish school	150 p/m per child (AM) x 2	300
Fee Mission school	250 p/m per child (PM) x 2	500
Books	100 p/book (every two weeks) x 3	600
Clothes	50 p/m (over a year) x 3	50
Well water	30 p/w	120
Drinking water	15 p/w	60
Fuel for boat	140 p/d (when working – 2 trips a week)	1120
Debt – sofa, television	80 p/m	80
Family clothes and toiletries	500 p/m	500
Husband drinking	500 – 1000 p/m	750
		9880 L (\$526)
Income		
Husband	Average 200 p/d Varies from 0 – 500 p/d	4000
Wife	50 p/d	1400
		5000 L (\$266)
End of Month Deficit		-4480 p/m (\$238)

Table 13 (Exchange Rate 18.8L to US\$1)

A family income may vary dramatically from month to month depending on the availability of work e.g. fishing seasons. The deficit of money shown in this example may be made up by: 'hussling' - borrowing money off friends or family; doing extra jobs for cash; or it is absorbed into their current debt until a period of high income means if can be paid off. Assistance with school fees and school clothes is sometimes given by the Mission for low-income families.

Many families live off credit (private money lenders rather than financial institutions). There are few saving opportunities – the banks are far away, and money goes out as fast as it comes in. Only a few families own a bank account. People often pawn household goods and buy them back at a later date when their income increases. Gambling, in the form of cards and dominoes, can also seriously effect household accounts; affecting both men and women.

Table 14 shows the Percentage of Each Village Employed by Fishing

Percentage of the village employed by fishing N=364	Village					
	Bentley Bay	The Bight	The Point	Sico	Mangrove Bight	Northside
	27%	14%	8%	24%	19%	22%

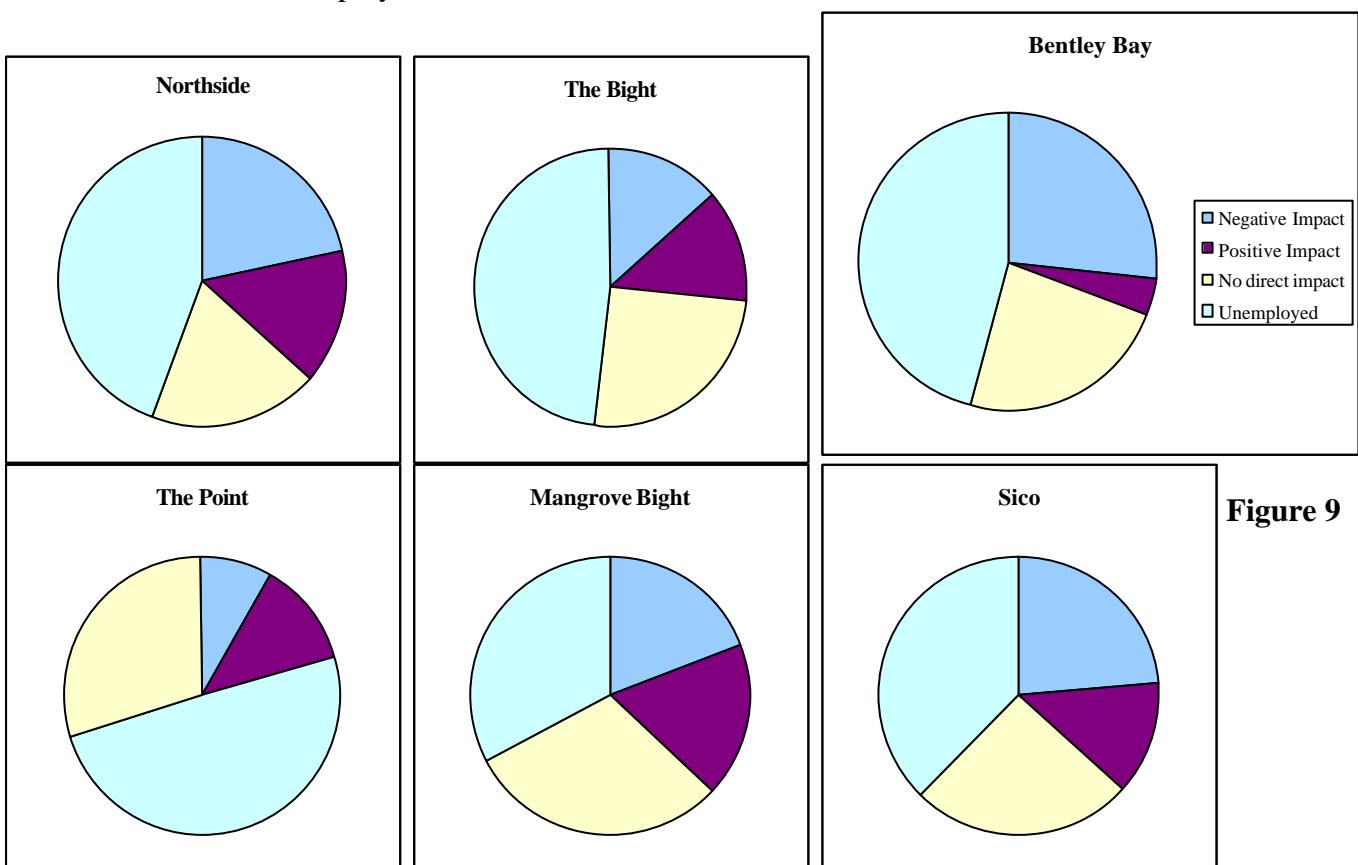
Table 14

Although fishing is the primary occupation in Helene, the proportion of people employed in fishing varies between villages. Bentley Bay has the highest percentage of fishermen, 27% and The Point the lowest, 8%.

Potential Impact of Proposed MPA on Each Village

If we assume that fishermen will be initially negatively affected by the restrictions introduced with a MPA and that a MPA will encourage tourism as an alternative employment then we can estimate the potential impact on each village, in terms of employment, of the MPA.

- Potential direct negative impact: fishing
- Potential direct positive impact: tourism, services, shop / restaurant / gasoline and small enterprises
- No potential direct impact: all other occupations.
- Unaffected unemployment: housewives and students

**Figure 9**

Bentley Bay has the least positive impact potential and the greatest negative impact potential because the village relies heavily on fishing as a source of income. The Point is the only village that has a greater positive impact than negative but also has the greatest unemployment (Figure 9).

COASTAL AND MARINE ACTIVITIES

S10. Household Activities:

It is important to identify which coastal and marine resources are used by the community, and how they use them, so that resources that are relied upon can be managed sustainably and are available for continued future use. Table 15 shows the primary coastal / marine activities identified by each respondent.

Coastal and Marine Activities	% of Sample That Indicated This as Their Primary Coastal / Marine Activity	Extractive / Non-Extractive
Fishing	36	Extractive
Transport	30	Non-Extractive
Coconut oil making	12	Extractive
Enjoyment	7	Non-Extractive
Collecting shells for jewellery	5	Extractive
Collecting wood for carpentry	5	Extractive
Farming	3	Extractive
Hunting	2	Extractive
Art	1	Non-Extractive

Table 15

Fishing and transport (which was the primary coastal / marine activity of most women) are the predictable answers from an island community. Other activities are generally related to small-scale enterprise: shell collecting, coconut oil making etc.

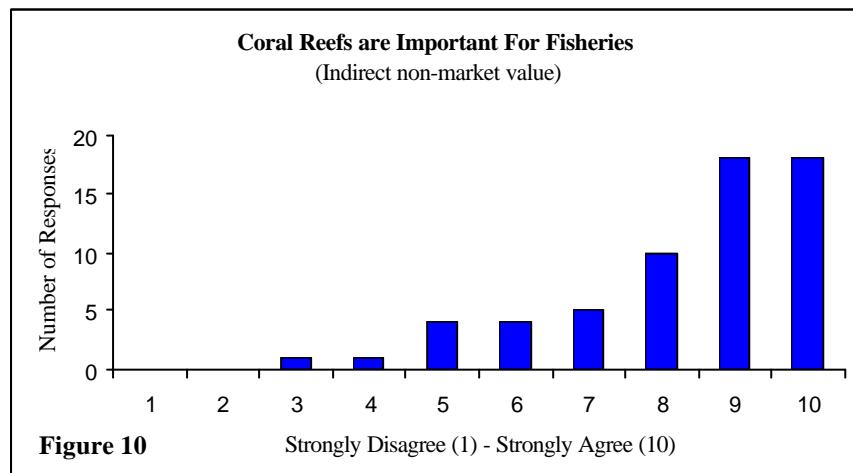
S10-14. Household Goods and Services, Types of Household Uses, Household Market Orientation and Household Uses:

Please refer to K14-22. The information used for variables K14-22 was gathered using the marine activities questionnaire and are a representative sample of the whole community's coastal and marine activities.

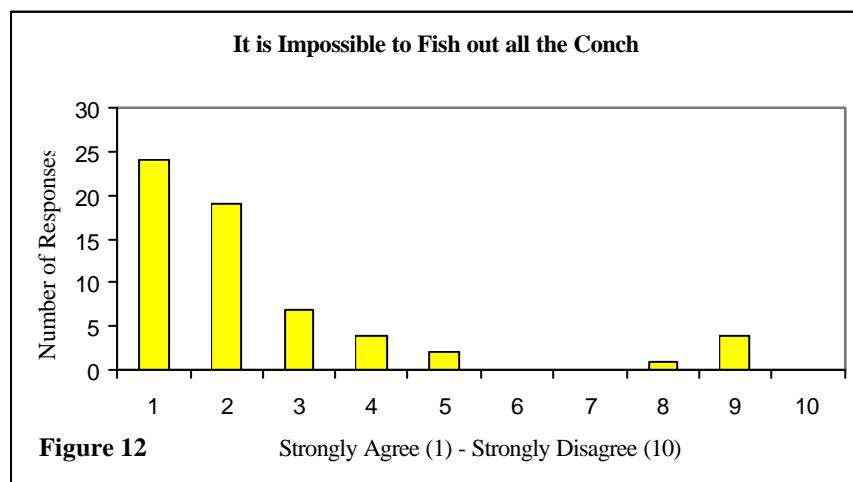
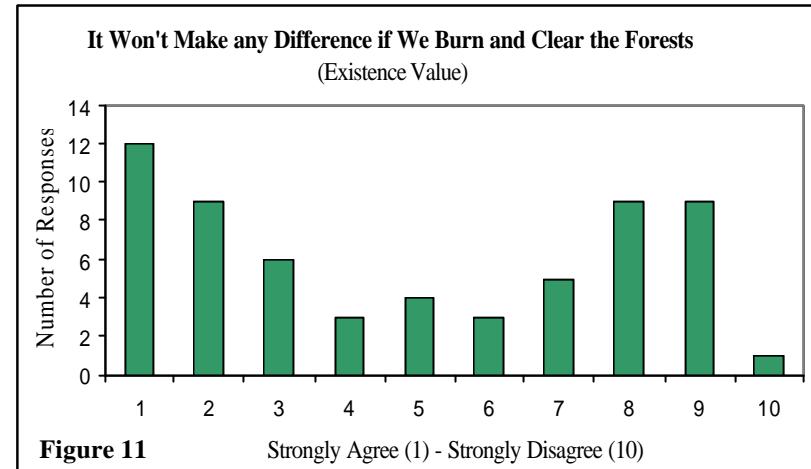
ATTITUDES AND PERCEPTIONS

S15. Non-market and Non-use Values:

Sliding scale questions can be used to determine the non-market and non-use value of coastal resources, in this case: coral reefs, forests, land and conch. Each respondent is asked to indicate the degree to which they agree or disagree with a series of statements.

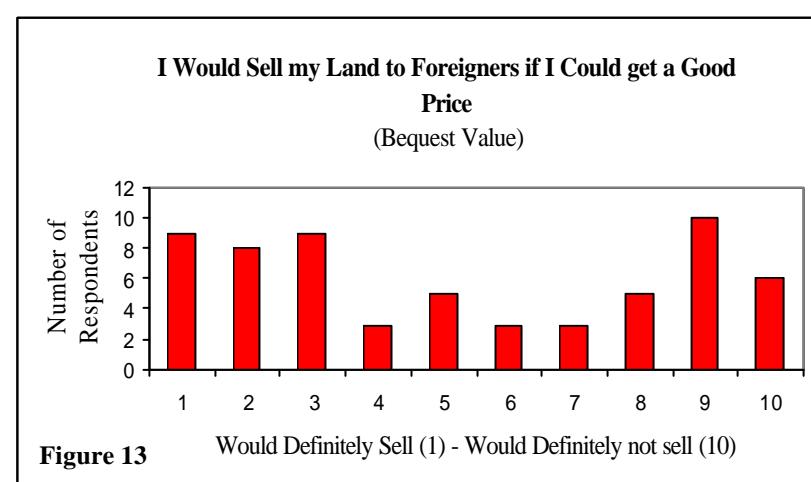


90% of respondents agreed that coral reefs are important for fisheries (Figure 10)
If responses are equated with the existence value of the forests, then 39% of respondents valued the existence of forests (Figure 11)



89% of respondents thought it impossible to fish out all conch (Figure 12).

The response to selling varied widely; some wanting to leave land to their children and some preferring to take the money (Figure 13).



Participants were asked to rank a list of coastal resources in order of importance to them. Table 16 shows the results:

Figure 14

In order to compare the ‘Total scores’ of each resource, the percentage of respondents that ranked each resource 1 (most important) was multiplied by 9 and divided by 100, 2 was multiplied by 8 and divided by 100, 3 multiplied by 7 and divided by 100 etc. to give the results shown in Figure 13.

Fish and fresh water ranked as the most important resources, with soil and seagrass the least important.

Coastal resources omitted from the original question design but later mentioned in the interviews include; ‘the sea’ and ‘beaches’.

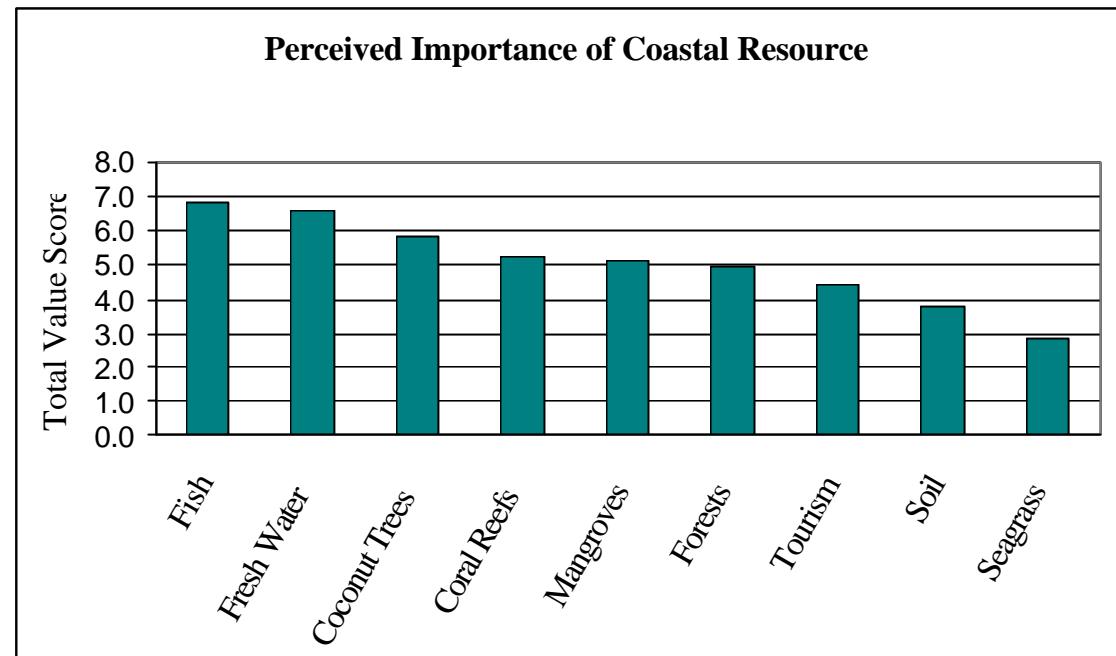


Table 16

% of Respondents That Assigned Each Importance Score to Each Coastal Resource N = 101	Coastal Resource	Perceived Importance of Resource (1 – most important to 9 least important)								
		1	2	3	4	5	6	7	8	9
	Fish	29	14	18	13	10	9	5	3	0
	Fresh Water	26	22	14	7	6	10	7	6	3
	Coconut Trees	15	10	14	25	9	11	3	6	8
	Tourism	10	8	7	11	14	5	11	16	19
	Mangroves	9	7	10	16	16	17	10	9	7
	Coral Reefs	5	14	15	13	13	16	6	13	6
	Forests	4	11	10	10	23	11	20	9	3
	Seagrass	3	2	5	3	8	9	11	20	40
	Soil	0	13	8	3	2	13	28	19	15

S16. Perceptions of Resource Conditions:

People were asked to rate the condition of each resource on a scale of 1 – 5 (Table 17).

Resources	Percent Responses That Describe Resource Condition as:					
	Very good (5)	Good (4)	Neither good nor bad (3)	Bad (2)	Very Bad (1)	Average Score
Mangroves	70	26	4	0	0	4.7
Coral Reefs	50	39	10	1	0	4.4
Fresh Water	40	32	26	3	0	4.1
Forests	51	35	9	5	0	4.3
Seagrass	67	22	11	0	0	4.6
Fisheries	43	47	11	0	0	4.3
Beaches	52	36	10	2	0	4.4
The Sea	68	27	2	3	0	4.6

Table 17

All 8 coastal resources averaged a similar condition score of 4 (good). Mangroves ranked the highest at 4.7 and fresh water the lowest at 4.1 (Figure 15).

Forests received the greatest number of low scores but no coastal resource was perceived as being in ‘very bad’ condition (Figure 16).

The sea and the mangroves received the most ‘very good’ and ‘good’ ratings.

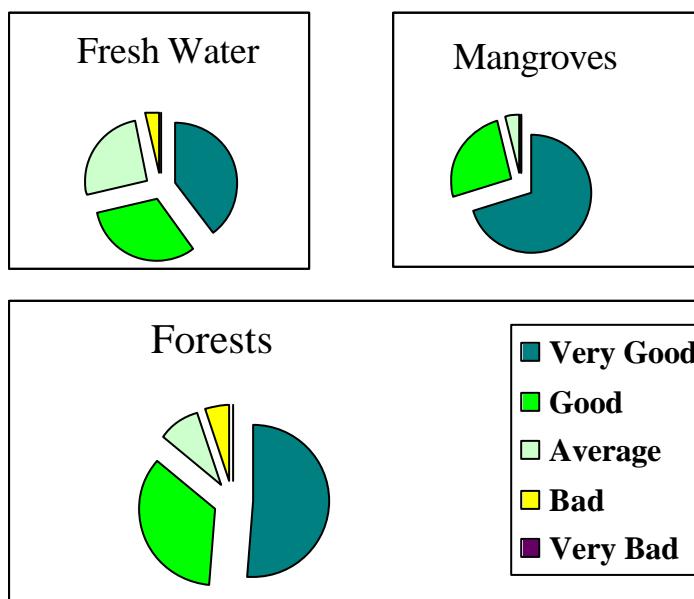
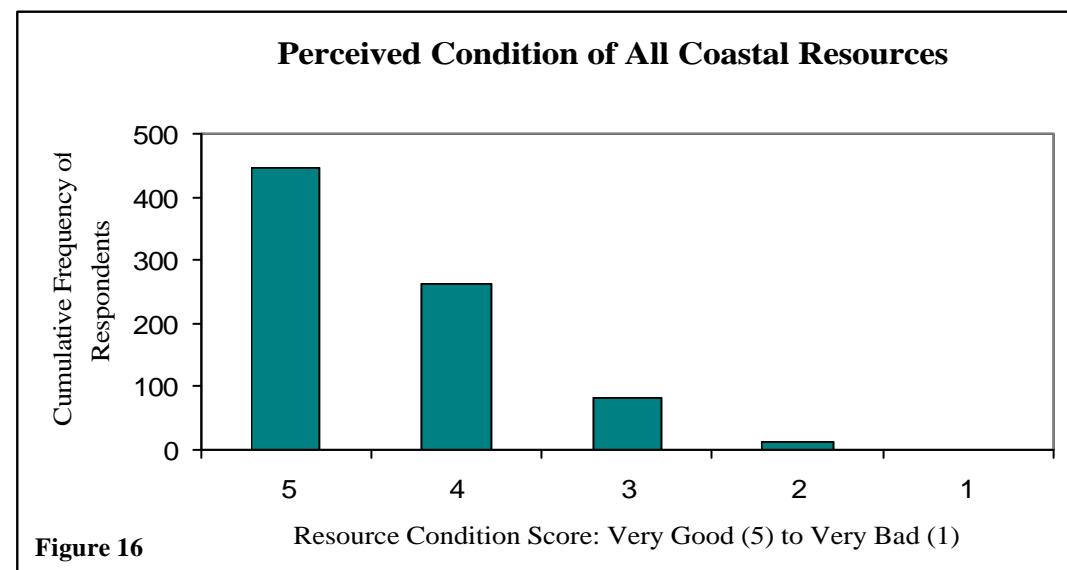


Figure 15



S17. Perceived Threats

Perceived threats measures what people think are the major threats to the coastal resources. People were asked to name 3 threats to the coast and Table 18 shows the results:

Threats N = 186 (3 answers per respondent)	Coastal Resources		Fishing	
	Response	Percentage	Response	Percentage
Litter, waste disposal	89	Catching small fish / lobster / conch	79	
Burning trees (forests)	58	Catching fish with eggs	47	
Cutting trees (inc. mangroves)	56	Seine nets	42	
Can't think of any	24	Weather / moon changes	40	
Sewage	23	Over-fishing / not enough fish	27	
Mangrove destruction	18	Market conditions / low prices	19	
Building	6	By-catch of small fish	13	
Over fishing	6	Catching big fish	6	
Bad weather (hurricanes)	6	Spearguns	6	
		Fishers from outside Helene	5	

Table 18

S18 – S21. Awareness of the rules and regulations; Compliance; Enforcement; Participation in Decision-making

Having few recognized regulations (S18), compliance and enforcement (S19, S20) become redundant. Variables not included in survey. See K29 for further details. The people of Helene have not participated in any form of coastal management. Coastal management decisions for the Bay Islands are made by PMAIB (through the Ministry of Tourism) and other relevant Central Government Agencies.

S22. Membership in Civic (Stakeholder) Organisations :

There are no current stakeholder organisations operating on Helene. There are however a number of civic organisations. Percentage that noted themselves, or a family member, actively participating in at least one organisation: 39%. Table 19 shows the percentage membership of each organisation.

Membership in civic organisations N=39	Organisation	Percentage	Gender Ratio (Male : Female)
	Church	17	40:60
	School	8	10:90
	Football	7	100:0
	Patronato (Island council)	6	40:60
	Basketball	5	100:0
	Local municipality	1	80:20

Table 19

The sports teams are male dominated although there is a female football team that meets irregularly. The strongest female presence is with the school group. See K32 for additional information on these organisations.

S23. Perceived Coastal Management Problems :

Participants were asked to describe as many problems relating to the coast as possible. Respondents struggled to answer, and a high percentage of people perceived no coastal problems at all (Table 20).

Percentage distribution of perceptions of coastal management problems N = 101	Response	Percentage
	No answer	62%
	Fights over land rights	18%
	Litter/waste disposal	11%
	Other fishermen	4%
	Too much fishing / not enough fish	3%
	Navigation	1%
	Building close to the sea	1%

Table 20

S24. Perceived Coastal Management Solutions :

Participants were asked to think of any solutions to the coastal problems they had identified for S23 (coastal management problems) (Table 21):

Percentage distribution of perceptions of coastal management solutions N = 101	Responses	Percentage
	No answer	96%
	Jurisdiction over our fishing grounds	2%
	Fishing restrictions	1%
	Navigation buoys	1%

Table 21

S25. Perceived Community Problems:

Every household was asked to highlight three community problems. Two answers; the lack of electricity and the lack of employment were the most common responses (Table 22).

Perceived Community Problems N=131	Response	Percentage
	Lack of electricity	92%
	Lack of employment opportunity	82%
	No or unreliable fresh water supply	53%
	Education: cost of access to higher education (college)	24%
	Social problems: drugs; inadequate healthcare	21%
	Road, transport problems to mainland	18%
	Litter, waste disposal	8%
	Cost of living	3%

Table 22



Economic
Environmental
Social

S26. Success in Coastal Management:

Not included in survey. See K25-28 for further details.

MATERIAL STYLE OF LIFE

For household materials:

Percentage of respondents that own houses: 99% of people on Helene own their own house. The houses are all owned by the occupants, however the land on which it stands is often leased (for free) from family.

Percentage of houses that have:

Roof:	57% tile	42% tin	1% wood	0% thatch
Outside structural walls:	0% tiled	10% brick/concrete	90% wood	0% thatch
Windows:	69% glass	30% wooden	1% open	0% none
Floors:	90% wooden	10% cement	0% thatch/bamboo	0% dirt

For productive assets:

Percentage of respondents that own: 0 boats 76% 1 boat 21% 2 boats 2% > 2 boats 1%

Percentage of boats made of: fibreglass 98% wood 2%

Percentage of boats that are propelled by: motorized 98% non-motorised 2%

In order to gauge an individual's perceived level of wealth, respondents were asked how wealthy they thought Helene was compared to Roatan and then compared to the rest of the world. 92% thought that Helene was 'very poor' or 'poor' compared to the rest of Roatan and 100% thought that Helene was 'very poor' or 'poor' compared to the rest of the world.

PERCEPTIONS AND ATTITUDES TOWARDS PROPOSED MARINE PROTECTED AREA

Would you like Helene to become a Marine Protected Area?

- 36% of respondents were aware of the concept of a MPA.
- If necessary an explanation of the aims of a MPA was given.
- 95% of respondents were in favour of having a MPA in Helene.
- 64% thought the introduction of a MPA would not affect them in any way.
32% thought it would affect their lives positively
4% thought it would affect their lives negatively.

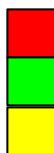
Box 3

Perceived Advantages and Disadvantages of Introducing a MPA:

Advantages and disadvantages in Table 23 have been colour coded to distinguish environmental, economic and social issues. The majority of the advantages are economic and the majority of the disadvantages are social. On average people only indicated 1 advantage (possibility of more jobs) and no disadvantages.

What are the Advantages and Disadvantages of Having a MPA? N = 101	Advantages	Number of People	Disadvantages	Number of People
	Create jobs	58	Loss of freedom with any rules introduced	3
	Jobs that are easier than diving	9	There would be a problem stopping other people coming in and fishing.	2
	Regular income because weather means you can't fish all the time	6	It will cause arguments over jobs	2
	Move people into action	3	Tourists may be a bad influence on the young	1
	Money for education / community	2	Not allowed to fish	1
	More fish and lobster	1	What would the men do for a living?	1
	Earn higher wages	1		
	Save mangroves	1		

Table 23



Economic

Environmental

Social

MPA and Tourism:

Participants were asked to mark on a scale the degree to which they thought the development of tourism on Helene would cause problems. The results in Figure 17 show a mixed response.

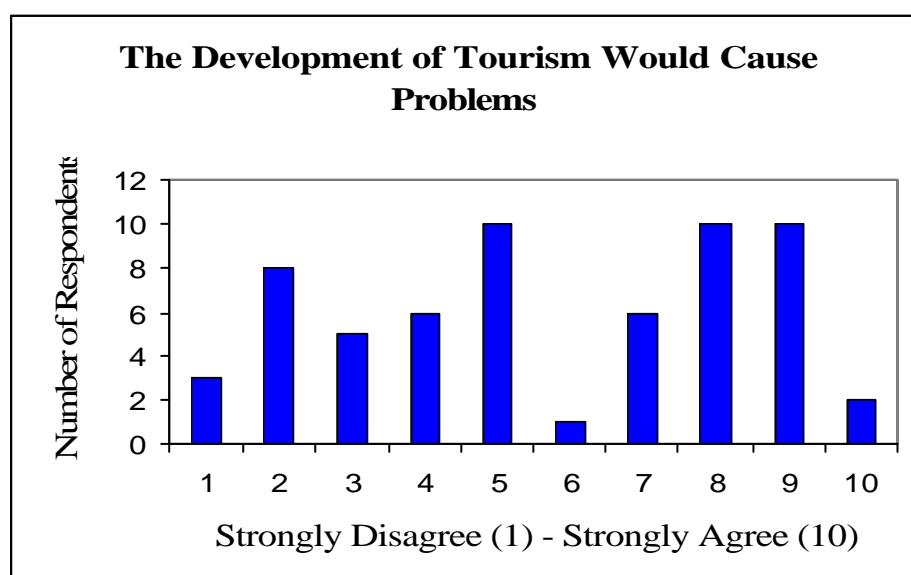


Figure 17

Using West End as an accessible example of a developed tourism site, participants were first asked how many times they had been to West End / West Bay and then asked if they thought tourism the same should be developed on Helene. Figure 18 shows that 75% of respondents had visited West End / West Bay up to twice in their life and a third had visited more than twice. Figure 19 shows that 90% of people interviewed agreed that similar tourism should be introduced on Helene.

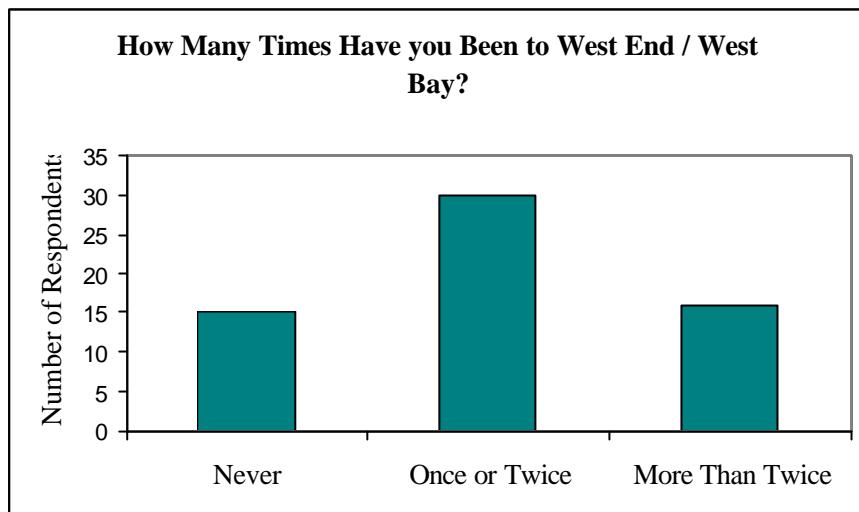


Figure 18

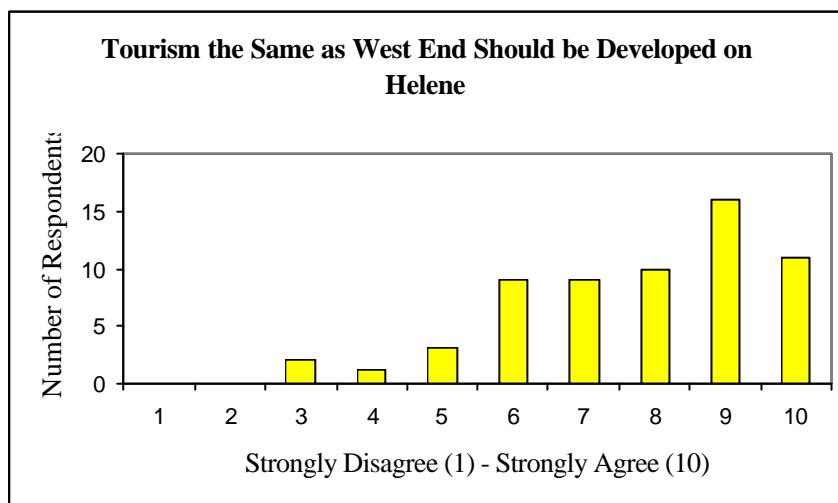


Figure 19

Alternative Livelihoods :

Some of the fishermen were asked what they would do if they were no longer able to fish. Over 50% said they would try and get a loan to start their own business. 20% said they would turn to farming and 13% each said they would look for work on the seas (abroad) or go into the construction industry.

Management

When asked “Who do you think should run the MPA?” 98% thought someone from Helene or the Helene Community, 1% thought someone from Roatan and 1% thought the government should run the MPA.

6. DISCUSSION

i. Community Level and Household Demographics

Background

Study Area

The proposed management plan [6] has set biological boundaries to the MPA. Any management plan needs to zone according to biological and sociological issues. The majority of line fishermen currently fish along the outside of the boundary of the proposed MPA so management initiatives inside the park boundary would not affect their current practises. However, the MPA would potentially disadvantage the tank divers that use the reef resources and poorer fishermen who have limited range using wooden canoes and paddles, and do not regularly use the outer banks. In effect the MPA boundary divides the fishing community by gear use and status and would disproportionately disadvantage the most vulnerable fishers. The park boundary should be discussed with the community to find the most equitable / acceptable solution to managing the fishery. The MPA boundary should be extended to include line fishing areas, otherwise, the predicted effect would be a gear shift away from tank diving and an increase in fishing pressure on finfish resources. Fishing seasons are not taken into account; fishing becomes much harder during the hurricane, squall and rainy seasons, when fishermen need access to closer fishing grounds to earn the money that sees them through the unreliable income periods. Not all the stakeholders live within the management area; fishers from Guanaja and the north coast of Roatan, that currently share access to the waters around Helene and Barbareta, need to be included in the management scheme.

Population

Wiefels, 2000 [9] estimated the total population of Helene at 668 people, SocMon results estimate a total population of 642 people (Box 1), which would indicate that

the population has been relatively stable over the past 6 years. However, with 43% of the population under the age of 16 and an average family size of five, Helene would appear to have a young and rapidly growing population. Anecdotal evidence from key informant interviews suggests that the island is becoming more crowded, the local medic estimated a birth rate of 12 babies per year (Box 2) and 13 houses were constructed during the 5 months the study was carried out (20% growth rate per year). A growing population requires a strong emphasis on resource management so that the environment is able to meet future demands.

Survey results also found high out-migration (in contrast to the rest of Roatan [23]). People move to Roatan, La Ceiba and to the US to find employment, live with family and to study (Appendix C). There is also a tradition of sending young men to work on commercial fishing boats on the Honduran Banks and in the Cayman Islands. Education is particularly highly prised and the average age people leave education, 13.5 years, reflects the increased costs of educational opportunities after this age (Table 13). There are many well-educated young people with valuable secretarial, information technology and tourism management skills that are unable to find employment.

Compared to the ethnic diversity on the rest of Roatan, the population of Helene is made up of almost entirely of black bay islanders, a fact of which the islanders are proud. The high number of Latino immigrants (from the mainland), associated with tourism development on the rest of the island, are not present on Helene, partly due to the lack of employment opportunities and partly due to historical racial conflict between the two groups. The non-native residents of Helene are an eclectic group of political refugees, ex-convicts and people moving to Helene to ‘disappear’. Despite the numerous references to the Garifuna in the management plan, none of the Garifuna population live on Helene. Spanish school, Spanish TV programmes and the increase in Spanish speakers on Roatan has all led to a more bi-lingual society. English is the first language; however 82% of people speak at least basic conversational Spanish as a second language. In terms of the proposed MPA, these findings show that in order to be fully inclusive, the management plan and any

subsequent reports should be made available in both English and Spanish (currently only available in Spanish).

Occupation

On Helene 59% of people working support 41% of people classified as ‘unemployed’. Everyone earning contributes to the total household income and this money is shared to cover household expenses i.e. food. Wages are low and households undertake a variety of income-earning strategies to achieve optimum livelihood security. In the interviews people tended to give the work they were doing at the time as their primary occupation and not give a second occupation unless they were doing two jobs simultaneously. This means that labour mobility is not accurately portrayed by the statistics, and number of people who rely on fishing, when unemployed, is underrepresented. Respondents felt like they had to give an answer, so even if they were temporarily unemployed, they answered that they were ‘a carpenter’ or ‘a construction labourer’.

Fishing

Fishing is the most common occupation in Helene; 36% of people fish as their primary occupation and 45% of people dependent on fishing as all or part of their income. The number of people that fish is underestimated by the statistics; virtually all men grow-up learning to fish and will fish for some part of the year. There are potentially 186 fishermen (men over 16) on Helene. Spending some time working on the commercial fishing boats is highly regarded, ‘turns you into a man’, and the men on Helene have years of combined experience working abroad as boat captains and crew.

The fishing community is not easily divided by gear. There are two preferred gears, line fishing and tank diving, but fishermen tend to use a mix of both approaches depending on weather, season, target catch,

BOX 1

“Maybe easier jobs than divin. You fish everyday and you don’t know if the fish will bite or the winds blow right or the sea will be clear enough to dive” (Sorn McBride)

gear availability, stock conditions and preference. For further information on artisanal fishing in Helene, see Williams 2004, Berthou 2000, Wiefels 2000, Wiefels 2000, Boncoeur 2000, Berthou 2001 [7-11, 17]. Fishing is a high-risk occupation; vulnerable to seasonal and cyclical fluctuations in fish and weather; changes in demand and therefore market prices, and physical danger. Fishermen say they are ‘slaves to the weather’ and that ‘they cannot afford to live that way’, the work is hard, the returns low and that they would like other employment options (Box 1).

Fishing families often engage in diverse activities in order to achieve livelihood security. Other income-generating activities include small miscellaneous businesses run by women that provide a much needed alternative income - an adaptation to the uncertainty of fishing success. Activities conducted by other members of a fishing household are often involved in different economic sectors to smooth the effects of resource variation.

Other Occupations

A variety of other occupations make up the remainder of the job market, all of which are saturated at their current low levels, due to little economic development. From key informant interviews the amount of farming has decreased in recent years. This is attributed to it being, ‘hard work - that the younger people are no longer interested in doing’. In Wiefels’s survey in 2000, 30% of fishermen farmed as a secondary occupation [9], according to the SocMon results this coastal activity has declined substantially. Age and educational influences on occupation appear to follow the usual patterns; higher level of schooling with vocational jobs, low education level among the unemployed. Choice of occupation is heavily influenced by family trade.

Unemployment

From the statistics in Table 11 it appears that unemployment on Helene is very high, at 41%. Unemployment can indicate a greater pressure on resources. However, just 6% of people consider themselves unemployed, this figure includes: the retired; drug addicts, people unable to work through disability (e.g. people suffering the long term consequences of DCS from tank diving) and people between contracts e.g. seamen and boat captains that are contracted to work for 6 months at a time. There is little

underemployment. A further 4% of the unemployed are above 16 and in higher education. 31% of the unemployed are housewives, a labour that generates no monetary income, yet is considered a full time job, especially with large families and no modern conveniences; water collection, cooking, child minding and laundry by hand take many hours.

People *have* to do something to earn money, people can not afford to be unemployed, as there is no government benefit or support system. As mentioned before, people would rather give a general profession, than admit to being unemployed, which carries a social stigma, however many people are subsistence living. The SocMon method is structured in such a way as to box people into well-defined full-time occupations within a single economic sector, which does not adequately reflect the cross-sectoral livelihood strategies adopted by most in the community. The consequences of this for an MPA are high mobility between employment sectors. Capital / asset investment in fisheries and most other occupations is low, also leading to high mobility and the opportunity for people to move away from environmentally unsustainable activities if given alternatives.

Occupation by Gender

Occupations are strongly gender-differentiated. Women undertake all housework and childcare responsibilities which make up an important part of the informal economy. Small enterprise, such as shops (pulperias), coconut oil making, hairdressing etc. are suited to women; they can be flexibly organised and are a way for women to contribute to the income of the household. Many women indicated that they would have liked to work if given the opportunity when they left school, or, when their children grow up. Women said it was hard to work when jobs have such low wages, travel costs are high and they can not earn money to make it profitable. The results in Figure 8 seem to show working abroad as an exclusively female occupation (as maids or child minders) which is misleading as men also work abroad (as painters, builders and crew on boats); an example of the quantitative results not accurately reflecting the situation. The reference social scope for the framework is typically considered to be the extended household, including members that stay away from home but send remittances back to the resident homestead, however, men tend to stay away longer, and as their role in the house of day to day provider is taken over, they were not

considered as a permanent member of the household and as a consequence were not recorded in the household survey.

If more job opportunities are created and the economy stimulated, planners will have to look at ways in which to efficiently utilise the female workforce.

Illegal activities

Illegal activities on Helene include: drug dealing, wildlife hunting, sand mining, conch and lobster fishing (out of season) and mangrove cutting. None of the above were regarded as a full time occupation, so are underrepresented by the statistics. Results are biased by the kind of people of people that are open and willing to admit to illegal activities and the majority who are not. Drug dealing in particular was more of an opportunistic practise and therefore appears more commonly as a secondary occupation. More than one of the key informant interviews suggested that as many as 90% of the houses in Helene were built using money from drugs. It is very difficult to obtain an accurate picture of the extent to which drug money contributes to society, however, it is not something to be underestimated. It is the prevalence of illegal activities that perpetuates the suspicious and unwelcoming attitude of the islanders to government officials, the police and military. However, criminal activity genuinely supports legitimate social development and is one of the few options, open to everyone, to earn higher than a minimum wage. Money from drugs has helped build the shops, businesses and restaurants that currently exist. In terms of the MPA, overcoming the distrust and unsolicited surveillance associated with any form of outside regulation will be a major challenge. Benefits from the MPA must outweigh the costs of restrictions and the income from current illegal practises if it is to be economically successful for the islanders.

Household Accounts

The example given of one family's household accounts (Table 13) provides useful insights into family priorities and challenges. It shows that fuel (propane and gasoline) is an expense that substantially increases the cost of living. Education is a benefit that families are willing to pay for. Finding continuous employment is difficult and leads to variable income. If the accounts had been recorded over time the intra-household response to variable income would have shown; allocation of

family labour in times of need, acceptance of income variation and modification of consumer patterns. There are no opportunities to save, families can easily get trapped into a spiral of debt and borrowing when no secure loans or financial management / assistance are available. Social problems such as drinking and gambling influence live on Helene. Friends and family provide an important support network. Other households may receive remittance from family living abroad, especially family in the USA or husbands working at sea.

Potential Impact of Proposed MPA on Each Village

Unequal income distributions and power structures between villages have existed for generations solidified through family ties. Table 14 and Figure 9 use the occupational data to make inferences about the potential impact of an MPA on each village. Analysis suggests that a MPA would affect villages differently and these differences should be taken into consideration in management strategies. Fishing restrictions are generally the first rules to be introduced with marine conservation efforts and because the villages on Helene rely on fishing to differing degrees there will be varying levels of impact. Bentley Bay where fishermen predominantly use tank diving, and is furthest away from the services at the centre of the island, would be impacted the greatest. The Point, where occupations are more varied, and rely to a lesser extent on fishing, would benefit the most.

Key Findings - Demographics

- The management plan and subsequent reports and awareness initiatives should be conducted in English and Spanish.
- Wages are low and underemployment low; households follow an optimum livelihood strategy by undertaking a range of income earning opportunities (not reflected in the SocMon).
- Women play an important role in household income generating activities through small business development.
- Criminal activity supports legitimate social development. Benefits from the MPA must outweigh the costs of restrictions and the income from current illegal practises if it is to be economically successful for the islanders.
- Introduction of an MPA will have a varied impact on villages, an issue which should be considered in management.

ii. Community, Infrastructure and Business Development

Without investment in community services and infrastructure the potential for development is limited. The current infrastructure on Helene is insufficient to cope with the demands of tourism e.g. limited amount of fresh water, no sewage, waste disposal or reliable electricity.

The lack of sewage and waste disposal facilities is strongly connected to the existing environmental degradation of water quality and aesthetic value on the island. At the time of the study the community had started using a nearby mangrove cay as a temporary landfill site. This cay is not only an important, future tourism attraction in the Governments plans but the cay lies in close proximity to a good quality reef and is a nesting site for crocodiles. Damage caused by waste spreading and toxins leaching into the water could have lasting impacts in the area. Scenarios such as the one described will continue to occur without the technical and financial assistance necessary to find sustainable solutions to these problems.



Toilets and pig pens release sewage directly into the lagoon

The availability and rapidly rising price of fuel has a significant impact on the island. Gasoline and diesel are necessary to run: generators for electricity; boat engines; the compressor (to fill dive tanks for fishing) and the pump for the water supply. The cost of fuel has consequences for fishing: how far, and for how long fishermen can afford to stay out at sea; how many hours a day generators can be run to refrigerate the catches and therefore the size of the market. With occupations such as construction the price of transportation affects the size of area it is cost effective to look for work.

Helene is reliant on imports of food and fuel, making the cost of living dependent on outside markets, and the community more vulnerable to shocks. There are essential services: drinking water supply, good quality education and medical care that are only provided through a private Christian Mission [24]. Reliance on assistance from outside the community is undesirable for two reasons 1) people who do not support the Mission are forced to find these services elsewhere and 2) the Mission is under no obligation to stay and could decide to leave at any time.

Education was identified through informal discussions as an issue of major concern. The standard of teaching at the government school is considered to be low. It is difficult to attract good quality teachers to work on Helene and hard to persuade the mainly Spanish teachers to stay. There are waiting lists for places at the school and education above the age of 14 is expensive as there is no college on the island. At the time of writing, a community college was being established, but struggling due to lack of funding.

The limited means of communication should have a bearing on the design of any community education and outreach programmes initiated in preparation for the MPA. The most effective means of communication is through direct contact – group meetings, presentations and workshops. Access to information increases the power inequity between the community and other stakeholders on Roatan.

Box 2 describes common health conditions on the island. The low standard of living is reflected in the prevalence of diabetes linked to a high carbohydrate diet. The estimated level of HIV/AIDS and amount of malaria and dengue fever on the island is of concern and making tests and treatment available should be a priority.

The indicators used for ‘material style of life’ are not particularly useful as a measure of wealth. Houses are constructed in a traditional style and although they may differ in state of repair, the materials used are consistent all over the island. More accurate indicators of change in economic development might be: boat engine size; number of concrete houses and number of DVD players.

Key Findings – Community Infrastructure

- Limited means of communication: will impact community education and outreach programmes; the information flow between the community and stakeholders (PMAIB) outside the community; may obstruct opportunities for development e.g. tourism marketing.
- Helene's dependence on good and services largely only available on Roatan: food; medical care; fuel and financial institutions, increases Helene's isolation and vulnerability to shocks.
- Sources of environmental impacts linked to community services and infrastructure are: sewage (raw), solid waste (especially plastic, metal, nappies and batteries) and pollution related to high levels of boat activity (fuel, oil and lubricants).

iii. Coastal and Marine Activities

Coastal and marine activities can be used to identify resources under harvesting pressure, sources of conflict, the perceived level of impact of activities and therefore areas to concentrate coastal management and awareness initiatives. The household survey revealed that fishing and transport are the primary coastal activities on Helene (Table 15). Coconut oil making is the third, which links to coconut trees being ranked third in the perceived coastal resources importance scale (Figure 14). Activities likely to be affected by the MPA include: mangrove clearance and drug running (already illegal); forest clearance; hunting and fishing.

Speargun fishing produces the highest valued produce, lobster and conch, which would indicate the greatest harvesting pressure. Mariculture is not currently a coastal activity but people are very keen to learn about lobster and conch ranching. This is potentially a way of investing in the high value produce with less environmental impacts. Finfish were regarded as medium value. The local and regional market for fish is particular; the preference on Helene is for high value white fish: red snapper, marlin, kingfish, queenfish, tuna and bonito. All other fish, especially low value reef fish are sold further down Roatan. Most fish is sold, rather than used by the household and lower value food: rice, plantain, beans are eaten instead. The impact of this targeted fishing must be similar to the effects of sport fishing (removing the top predators) so to encourage sport fishing as a tourism activity when fishing pressure is already high would be a mistake. Fishing is one of the few activities that involve stakeholders from outside the community; the fishing grounds are perceived to be so rich and accessible that they are used by fishermen from as far down as Punta Gorda. Any community management of fishing effort will need to include these fishermen to be truly participatory and reduce the potential for conflict.

Few conflicts exist among the current set of coastal and marine activities. The level of use by outsiders is low (expect with regard to the shared fishing grounds). Fishing techniques do not have a strong gear overlap (less tension) although some felt that tank diving should be banned and only free-diving permitted. Most activities are perceived as low impact, however, there is circumstantial evidence that activities such

as hunting and forest clearance are causing sever exploitation. Both activities used to be conducted on Helene and have now moved to Morat and Barbareta as resources dwindled. Animals, such as species of deer and parrot that used to be found on the island have been hunted to local extinction [25]. Iguana and their eggs are heavily harvested at Easter when the species are breeding. It may be difficult to engage people in coastal management if there is no perceived impact of their activities, education and awareness need to increase the breadth of understanding of impacts.

Another indication that people do not associate what they do with the coastal environment is that: tourism, construction, sand mining, mangrove clearing, forest clearing, drug running, waste burning are all coastal activities that came up in the key informant and secondary source data collection but were not perceived as coastal activities in the survey responses. Any that activity that was not carried out regularly by the respondent was not mentioned in the interview e.g. hunting is a recreational activity, often done by children, but was underestimated by the survey results. The cumulative impact of all coastal activities is not something considered by the SocMon method, but, mangrove clearance, plus, forest clearance, plus, construction has greater potential for erosion, reef sedimentation and habitat destruction than if they are considered in isolation.

Key Findings – Coastal and Marine Activities

- The majority of coastal activities are perceived as low impact and of low market value. Educational awareness is needed to increase the breadth of understanding of impacts.
- High value produce such as lobster and conch are currently over-harvested, however, fishermen are keen to develop mariculture as a sustainable means of exploiting these goods.
- Cumulative impacts of coastal activities should be examined in the pre-implementation stage of management.

iv. Attitudes and Perceptions

Resources

Non-market and Non-use Values

Coral Reefs are perceived to have a high, non-market, non-use value. Respondents mentioned the importance of coral reefs for fisheries, and as a storm defence, with reference to Hurricane Mitch. This may be due in part to recent environmental

campaigns by CCC. Forests, on the other hand, were valued as a resource (for wood), with few people talking about the intrinsic value and ecological services that forests offer (Box 2). Environmental education regarding good forest management and the value of trees with regard to fresh water quality, watershed protection, prevention of erosion and sedimentation etc. would be beneficial. Environmental education in the past has focused on children, in the future adults programmes need to be offered.

BOX 2

"The forests are useful because you can clear them for land and collect wood for fire"
(Kiani Pouchie)

Despite a national fishing ban on conch and lobster fishing 89% of respondents thought it impossible to fish out all the conch and lobster. During the interviews some people qualified this statement with, "Conch have not really changed", "I like to eat conch so I do not think it will run out" and "Catches are down and this might be because too many young are caught, but it might be that they moved away after Mitch or it might be bad seasons". Whatever the reasoning, the majority of people thought there was less conch around now than in the past, but did not think it was possible for conch to disappear altogether. The supposition of over-fishing is confirmed by anecdotal evidence from the older fishermen who remember, when conch in particular, was plentiful in the lagoon, whereas now fishermen are lucky to find few conch and have to travel to the banks further afield to find them. This recognition of a decline in catch and the cause thought to be a consequence of overexploitation is rare phenomenon in fishing communities, and one that gives hope for future management.

Land tenure is a contentious issue on Helene. Land is passed down through families and divided up for housing as families grow. Despite the local government arranging a cadastral map of the area, land rights are regularly disputed and changed. Many brothers and sisters may jointly own a patch of land making ownership unclear and sales complicated. This issue has the potential to cause conflict with any future development on Helene, especially tourism where large areas of land may be necessary. When asked about the bequest value of their land, people were split between wanting the money (valuing the present higher than the future – through necessity) and leaving it for their children. As land prices rise this problem will become exacerbated (Box 3).

BOX 3

*“We got people selling their land to other people and what happen, they don’t have nowhere to stay and then start cutting down the mangroves”
(Raymac Pouchie)*

When people were asked to rank certain coastal resources in order of importance to them people gave the question a lot of consideration. The question was left open to interpretation which might explain why tourism scored highly when there is virtually no tourism on the island – valued as a future opportunity. Fish, fresh water and coconut trees were the resources valued most highly. Environmental services of some of the other resources may not be so well understood (soil & seagrass). Answers were also affected by where the respondent lived; people from the Northside did not rate mangroves very highly because there are no mangroves on the Northside.

Perceptions of Resource Conditions

BOX 4

*“Mangroves are important because they keep the breeze and the sea from killing you”
(Gloria Bodden)*

Coastal resources are perceived to be in good health (Table 17). 70% of responses rated resource conditions as ‘very good’ or ‘good’ and not one respondent rated any of the resources as ‘very bad’. Mangroves were perceived in the best condition. Although recent mangrove clearance has concentrated around the villages there are still large tracts of healthy mangroves connecting Helene to the mainland and these are valued for bait fish and as storm protection. This stands out in

peoples' minds as Guanaja is known to have lost many of its surrounding mangroves, and as a consequence suffered heavily during Hurricane Mitch, whereas Helene sustained relatively little damage (Box 4). Conservationists from Guanaja visited Helene after the hurricane to harvest mangrove seedlings for replantation. Mangroves are also valued as a waste disposal area. Fresh water has the lowest ratings; it is thought to be unreliable, insufficient in the dry season and not fresh enough to use regularly as drinking water. In reality the coastal and marine resources facing the greatest exploitation and environmental impacts are the reef, from: hurricane damage, bleaching, over-harvesting, sedimentation and macroalgae cover, and, forests being eroded by development and farming. Coral reefs are only seen by a small percentage of the community and long-term changes probably go unnoticed. Scientific monitoring is necessary to accurately determine significant environmental impacts and changes over time. The perception that resources are in good condition will make it hard to justify resource use restrictions on purely environmental grounds.

Threats, Problems and Solutions

Perceived Threats and Problems in Relation to Coastal and Marine Resources

People were asked to identify threats and problems relating to coastal management, threats specific to fishing and community problems.

Respondents clearly highlighted that waste disposal and litter was a threat to coastal health (Table 18). A recent campaign, facilitated by CCC, attempted to secure funding for a landfill site and collection bins, and brought this issue to the forefront of peoples' minds. Any potential coastal management should definitely look to find a solution to this problem that, as well as being a huge visual pollution, creates unsanitary living conditions and perpetuates environmental degradation through inappropriate disposal.

Burning and deforestation is an entry inconsistent with previous results. Forests are perceived to be in relatively bad condition compared to other coastal resources and are under threat according to the answers in this section, but are seen to be of low importance and valued only as a resource in the non-market question. Answers vary between villages and generations. Recent construction activity in Bentley Bay makes the loss of forest area (and shade on the road) particularly obvious and older generations describe a large loss of forest cover over their life span that may not be apparent to younger generations with a different baseline (Box 5). Sewage pollution was also mentioned; raw sewage is discharged directly into coastal waters that people use for recreational purposes. Sewage may be dispersed by strong sea currents running from east to

west, and as the water does not stagnate, this problem may appear to be of less consequence than it actually is. A high percentage of people could not think of any threats to the coast at all; this may be because they genuinely do not see the coast as threatened or that they are not used to thinking in terms of coastal resources.

When asked about threats to fishing, respondents replied with ease; catching juvenile fish, berried fish, over-fishing, bad fishing gears, changes in weather and other fishers. Older generations recall it being socially unacceptable to catch juvenile fish, lobster and conch (Box 6). The discovery of local grouper and snapper spawning grounds, by a couple of the fishermen, in the last few years, may further damage fish stocks if speargun fishing is left unregulated at these sites. The only hint at potential conflict for the MPA is threats to fishing described between different gears and fishermen from outside Helene (Guanaja and north Roatan). At present, fishing techniques do not have overlapping niches, which is positive, however, speargun fishers target large fecund fish, together with lobster, and conch which may be a practise incompatible with future MPA objectives. There is conflicting evidence as to whether seine netting is still in

BOX 5

"The Oceans, we have to stop these people that have toilets as the sea"
(Dan James)

BOX 6

"We have to tell the small kids not to catch fish when they got eggs"
(Jossline James)

operation, but the seine net use has clearly declined in recent years due to social pressure. Both speargun fishing and line fishing generate little by-catch and the majority of species caught have a market.

Respondents found coastal management problems more difficult to identify than threats (Table 20). 62% of people could not think of a single coastal management problem. Again, if people do not recognise that problems exist, engaging people in coastal management will be difficult. There are some obvious omissions, activities previously mentioned by key informants as having a high level impact; fishing, drug running, mangrove and forest clearance and construction (Box 7). In addition, no one mentioned lack of coastal management as a problem or education and awareness as a solution. 96% of people could not think of solutions to any of the coastal management problems identified (Table 21). In principle, the community was not opposed to the introduction of rules and regulations.

BOX 7

"I uses the crabbo tree for building the dori – but not much of that happens anymore, people nows they use the fibreglass. People here used to farm and live on the hill, but too many flies, so the people sold their land and moved to the water. Cut down the mangroves for land and cleared the front so they could see and get a breeze. [Mangrove cutting is] still happening. When we was young we used to throw the young lobster back but the youths them these days don't have no respect anymore."
(Calix Forbes)

Perceived Community Problems

The identified community problems were more reflective of the issues at the centre of society: corruption; abandonment by the government; inadequate infrastructure and lack of job opportunities, were discussed at length (Table 22). The quality of fresh water, the high cost of education and transport, and waste disposal issues have already been discussed. Unemployment, poverty and social isolation have fuelled various other social problems; drugs, prostitution and gambling. There are a small number of people addicted to crack (estimated 20 daily users) and a higher number of regular users of marijuana and cocaine. Drug use is associated with the only major crime on the island (theft). One key informant said that it was a very serious problem, "only a few of the young boys are on crack [14-18yrs]... they don't have anything else to do... lots of people just smoke weed.... weed makes you lazy... but crack can mess

you up..... we need to stop the selling.” There are also low levels of what is commonly described as prostitution. Prostitution has a different definition on the island; having sex with someone for money is not referred to as prostitution, prostitution is having sex with someone and not asking for money when your family is in need. Gambling is also commonplace; dominoes and card games. Dominoes is a very popular island sport, but with a small number of people, dominoes and card games turn into serious addiction, plunging families into heavy debt. There is no support for drug or gambling addictions.

Key Findings – Attitudes and Perceptions

- The most highly valued coastal resources are: ‘fish’, ‘fresh water’ and ‘coconut trees’. Environmental education needs to be offered to adults and children.
- As land value rise, conflict over land tenure, is expected to increase.
- Coastal resources are perceived to be in ‘very good’ or ‘good’ condition. It will be hard to justify resource use restrictions on purely environmental grounds.
- Very few coastal management problems or threats were identified. The perceived need for coastal management is low.
- Social and economic concerns, such as the lack of electricity and job opportunities, are the most important community problems and must be addressed in the management plan.

v. Governance

Management

Currently PMAIB has very little contact with the community in Helene. In 2005, representatives from PMAIB helped carry out a survey on waste to generate statistics for the landfill proposal. The project faltered due to local government bureaucracy and lack of community support and momentum. It was an initiative pushed for by one man from Helene, but when the necessary funding did not materialise, the project became just another unfulfilled government pledge, and has amplified the general feeling of despondency towards development projects and PMAIB.

Environmental laws relevant to Helene and Barbareta are continually ignored by the community, that for the most part is ignorant of their existence, this being particularly apparent with regard to the restricted fishing zone around Barbareta, the ban on speargun fishing and the rules prohibiting mangrove destruction. This can be attributed to the weak relationship between the island and decision makers, local government and law enforcement agencies as well as inadequate public notification of environmental regulations and lack of alternatives in the face of poverty and survival.

Few informal tenure and rules were identified in the SocMon interviews, although further investigation into tradition governance systems would be valuable. It appears in the past there was a strong intergenerational social pressure to conserve environmental resources in a similar approach that is adopted by the scientific and coastal management sectors today. It was forbidden to fish spawning sites and juvenile and berried fish were thrown back. It was suggested that this traditional fisheries management has been eroded in less than one generation by the emergence of a cohort with less respect for the traditions, reduced parental control and depleted resources. Although people are not adverse to the introduction of environmental regulations, to go from an effectively lawless state to the other extreme of intense control, such as a marine park, will be a difficult adjustment. Fishing groups set up in 2004 fell apart due to the over-zealous introduction of fishing regulations and

mismanagement. The marine park will need to be established using few simple rules and assume a constant, iterative process of re-evaluation so that regulations are introduced slowly, in appropriate stages and at the request of the community, to avoid complete rejection.

Government based management plans exist for the majority of coastal activities. The management plan put together for Helene and Barbareta has a heavy environmental focus, and concentrates on development through tourism. Social issues are mentioned but in a much wider geographical context and there is no investigation into social capital or other economically sustainable development options. The effectiveness of the management plan's strategies need to be assessed in light of this new socioeconomic information and an economic feasibility study included (a requirement of all developments, made by the General Law of the Environment, in the environmental impact assessment [21]). Hopefully this SocMon will enrich the important social and economic base of the plan and generate discussion using a broader context for development.

Stakeholders and Community Participation

Identifying stakeholders has become a central concern of coastal management. Stakeholder analysis is used to group people that are affected, interested or involved (positively or negatively) by coastal resource management. This concept is not easy to apply in Helene. Views, perceptions and opinions of people vary on a micro-scale and identifying stakeholder groups is unhelpful when there are no obvious associations to be made. Homogenising opinions up the scale to only a few large groups is unrepresentative and may cause conflict if acted upon literally. For the purpose of the study only, stakeholder groups for each coastal activity have been identified in Table 7.

Working with the community is easier to do through each village rather than on the scale of the whole island. People strongly identify with their village (families tend to be based in one particular area) which are all of a similar size, and any power issues arise between family groups. A more workable model as a basis for CBNRM would

be regular representation from the Patronato (island council) and a male, female and fishermen representative from each village, also ensuring that each of the main family groups is present without bias and there is a spread of age ranges.

Active participation in civic organizations is low (39%). There are a handful of individuals that work hard and serve on almost all the committees. The Patronato (island council) has a representative from each village but comprises only a handful of members. The council convenes infrequently and meetings are very difficult to organize, especially for outsiders. Personal relationships, politics and family ties influence decisions and the Patronato is often accused of mismanagement. Church organizations have regular followers and the church pastors are highly respected members of the community. The Church runs women groups that attend national and international conferences. However, not every one on Helene is devoutly religious, and on these grounds the group is not inclusive. Generally news and views are passed on through friends and family networks and people only come together, in a community management sense, in emergency situations e.g. hurricanes.

The Spanish School and College groups are the best examples of community participation in decision-making. Education is a subject people feel strongly about so a committee was formed to recruit teachers, lobby support and raise funds for wages, building maintenance and equipment. The group has regular meetings, high attendance and achieves results. 90% of the members are female

The advantage of this relative inexperience with community level management is that there is no legacy of bad management to correct, however, the disadvantages are the lack of experience and disenchantment of previously failed attempts by outsiders. If CBNRM is successfully set up with the marine park, the model could be adopted to tackle a broader range of community issues.

Key Findings - Governance

- Environmental regulations should be introduced in stages to aid compliance.
- The influence of traditional informal marine tenure has eroded and current generations no longer abide by the simple fishing principles established by previous generations.
- The effectiveness of the current management plan's strategies needs to be assessed in light of the socioeconomic information in this report and an economic feasibility study produced.
- At present, the concept of stakeholder groups is ineffective in Helene. CBNRM through villages, assuring appropriate representation would be more valuable.
- Although active participation in civil organisations is low, the School Groups are a good example of a community based management initiative.

vi. Perceptions and Attitudes Toward A Proposed MPA

Community Perceptions of a MPA

This, and the following section, aims to answer some of the immediate management questions thrown up by introducing a marine protected area: do people know what a MPA is? Would a MPA be supported in Helene? What would be the best way to introduce the concept and start the consultation / participation process?

The quantitative results show that 95% of respondents are in favour of a MPA - almost all responses qualified this by saying the MPA would be good if it generated new job opportunities (Box 3 & Box 8). Despite recent marine conservation awareness initiatives only 36% of people understood the concept of a MPA, 64% requested to hear the definition. This might be a terminology issue; where people are familiar with marine conservation strategies, reflected by the, 'threats to fishing' section with people talking about not using seines or catching berried females, but not the specific term MPA. 64% of people did not believe that the marine park would affect them, so although 95% of people support the MPA they are showing support for something that they do not believe will change their lives in any way. If the MPA does influence lives the number of people who support the MPA might change (for better or worse).

Perceived Advantages and Disadvantages of Introducing a MPA

On average people only indicated 1 advantage and no disadvantages. The majority of the advantages are economic (rather than environmental) and the majority of the disadvantages are social. Over half of all answers related to the possibility of more employment opportunities (Box 9). When questioned further people thought new work would be created through ancillary jobs: cooking; laundry; tours; selling jewellery and food. People assume the MPA will not involve them directly and so were thinking about expanding the ways they current earn money. The focus of the discussions was on economic issues – the park has to improve peoples' standard of

living if it is to succeed. People will become disillusioned with the MPA very quickly if it does not stimulate the economy in a noticeable way within the first few years of establishment. Disillusionment may lead to increase enforcement costs through lack of support. The low number of people who suggested disadvantages is unexpected, especially considering the controversial West End / Sandy Bay Marine Reserve on the same island.

Only two people during all the survey interviews mentioned environmental advantages of a MPA. This result confirms previous observations that people do not perceive a strong need for environmental protection and following a purely conservationist strategy will not engage people in the process.

The level of support for the MPA and advantages and disadvantages given may have been biased by the definition of a MPA. The definition was only given on request and based on standard scientific principles but rephrased to reflect local and language and education levels.

BOX 8

"I think it will effect me coz I have a family and I make my living divin. But I hope to see the marine true. I would love to have a better job than divin"
(Barrac Bodden)

Community Perceptions of Tourism

The statistical results show that 90% of respondents thought tourism the same as West End should be developed on Helene. The general feeling is that expansion of tourism to Helene is inevitable and therefore people support it and hope that it increases their standard of living by providing better paid jobs and more opportunities to work. However, few people had spent any significant amount of time in West End: three quarters of people had been there a maximum of twice over their entire lifetime. This indicates that people do not mix with tourists on a regular basis and peoples' perceptions of tourism are based on very little direct experience. People are aware they are less well off than the rest of Roatan, which is not surprising when there is such a huge contrast between the rich West End and the slow economy on Helene. This difference, often attributed by people to the development of tourism, might explain why people are keen to embrace it on Helene. For a wider range of views on

tourism Williams 2004 [17], demonstrates a sliding scale of support using divergent quotes from Helenian fishermen.

The data could be misinterpreted to conclude that all forms of tourism would be welcomed on Helene. There was a diverse range of ideas as to what tourism entailed. Unless an interviewee was specifically interested in opening a hotel / rooms to rent, the idea of tourism was related to day trips to Helene rather than large numbers of people staying on the island itself; bringing the opportunity to sell handicrafts, jewellery, souvenirs and give tours, similar to the passing trade from cruise ships. A few people suggested a tarmac road, through the mangroves, connecting Helene to the mainland, in order that cruise ship tourists could come up in buses. In reality cruise ship tourists very rarely travel as far east as Oakridge and Punta Gorda even though a road exists from the cruise ship dock in Coxen Hole. For more information on the impacts of the cruise ship industry on Roatan please refer to Fielding, 2000 [26]. Other people envisaged a small number of ‘rooms to rent’ businesses with restaurant. One thing the ‘visions’ had in common was that there were not large numbers of tourists staying on the island itself.

BOX 9

*“I think there would be quarrels with our home guys and others about the work. People would get vexed”
(Bonnie Bodden)*

A noticeable exclusion in the perceptions of tourism was that no one mentioned dive tourism, despite having had a CCC dive research base on Helene, and the fact that the tourism industry on the rest of Roatan is heavily orientated towards diving.

Experience of tourism for the 25% of people who had not visited West End has come from interactions with foreigners staying at the Mission and CCC’s base camp (no longer on the Helene). With regard to the Mission, the level of interaction with the community depends largely on who is managing the site: especially for some of the women, who do less travelling, the Mission is the only example of tourism they have regular contact with. There has been recent disharmony and reduced contact with the community; where in the past people were allowed sell jewellery and braid hair etc. the Mission has started selling their own merchandise, leaving little opportunities for

local business. As an employer the Mission has reduced its number of employees over recent years due to Honduran labour laws¹ but still employ a couple of people to sell water and carry out maintenance work. In order for people to take full advantage of opportunities tourism might offer and gain a balanced view on the costs and benefits associated with it, awareness initiatives need to include information on tourism.

Alternative Livelihoods

If fishing restrictions force fishermen to find alternative income it would potentially lead to increased pressure on forest resources. 20% of fishermen said they would, “hit the jungle and farm” leading to increased forest clearance for land. Most answers were based on access to credit; at present people have very limited access to credit and introduction of a MPA would not change this situation, so the proportion of people having to fall back on farming and construction increases. Fishermen rely on primary natural resources and a shift from fish to wood would not improve the status of environmental health. When women were asked what business they would start given the opportunity, most described extensions of work already undertaken: laundry service; hair saloon; beauty parlour and bakery, service industries that marry well with increased tourism (Box 11).

BOX 10

“I might be able to sell some sweet rolls and coconut bread”

(Jenny Gordon)

Development options / opportunities

Discussing social and economic concerns led to dialogue on perceptions of future desires for the island and how people would like to see Helene develop. The top priority was more job opportunities; a regular income enables people to support their families, pay for education and medical care and develop their own businesses. There

¹ Labour rights are protective of the employee and after three months of employment workers are given additional protection against dismissal. This encourages employers to use short term contracts of just less than three months to avoid paying compensation in the event of a firing.

were three principle ideas: 1) tourism, 2) sustainable fishing, lobster and conch mariculture, and 3) a fish / shellfish (crab) processing plant, each is discussed below. Development options need to focus on the social capital and opportunities already available in Helene. People just want the option of earning enough money on Helene to look after their families and get on in life. Further discussion with the community on preferred development would be very valuable.

Tourism:

The current management plan for Helene and Barbareta places a heavy focus on tourism, preferably ecotourism, and does not discuss alternative livelihood development options. The concern with tourism development on Helene is, that on an island without environmental protection regulation, or any kind of regulation and with no history of environmental management, tourism will be very difficult to control. On Roatan, where investment and resources are far greater, tourism development has caused serious environmental and social problems, so how is it possible to ensure sustainable tourism on Helene? Even within the national environmental legislation the objectives are sometimes contradictory and do not provide clear guidelines; environmental impact assessment are a requirement for development that will ‘provoke significant ecological changes’ [27]. It is hard to define ‘significant ecological change’ and the law does not say the recommendations from EIA’s *having* to be taken into consideration [28].

Obviously tourism comes in all shapes and sizes; from high-end ecotourism and exclusive dive resorts to backpackers and the cruise ship industry, which all have different environmental impacts and varying levels of success at contributing to the growth of local economies. The most probable and potentially worst impacts of tourism would be; the cumulative impact of individual developments, leading to environmental impacts far greater than anticipated and money not filtering back into the community and being lost to capital flight (movement of net revenues out of host country).

Sustainable fishing, lobster and conch mariculture:

Sustainable fisheries is a viable development alternative. The MPA could be an important tool used in conjunction with specific fisheries initiatives used to rejuvenate the fishing grounds around Helene and Barbareta so that they provide an increased income for fishermen. Concentrating on re-building stocks, improving storage and transport conditions, streamlining the supply train, building a market and marketing the product on its sustainable source. To its advantage, there is already a skilled labour force, the plan is environmentally friendly, a healthy environment may lead to other forms of enterprise and is part of the government's strategy for flourishing marine life in the Bay Islands. However, an economically sustainable fishery would require investment, long-term strategic planning and the cooperation of the fishing community to adhere to strict medium-term restrictions. It would also necessitate fishermen from Helene controlled access to the resource and were able to insist on these restrictions to outsiders.

Aquaculture is an idea favoured by many of the fishermen. Aquaculture on the Bay Islands is yet to be fully explored and offers great potential for an alternative to capture fisheries. Conch ranching and lobster nurseries are a relatively new initiative, nevertheless, the high value and strong demand for these products makes research into the idea worthwhile. Honduras has a worldwide reputation for the quality and environmentally sound methods used in it's shrimp farms on the Pacific coast and this expertise could be utilised to help start aquaculture projects on the Bay Islands.

Fish / shellfish (crab) processing plant:

With the decline and closure of the fish and shellfish processing plants in Oakridge, people believe that there is an opportunity to provide employment by having a fish or crab processing plant on Helene. The industry provides a lot of (low wage) employment for both men and women and is work that would not require re-training. The obvious downsides are the huge initial investment cost, the possibility that it would encourage over-fishing and the reliance on only one form of industry that is linked to unreliable global markets.

Management

There is strong support for community-based management; 98% of respondents were in favour of the MPA being run by the community (Box 12). People were asked to name individuals who they thought would make a good contribution to the management group; fishermen, rather than community leaders, made up the majority of people suggested to play a role in the management. The general feeling was that responsibility for the MPA should not be incorporated into the Patronato's role as there are other people better suited, and a feeling of slight mistrust towards the island council based on past experiences.

BOX 11

"The only peoples that fishes here is from Helene, the market for fishes is Helene so it must be our boys, the fishermen from Helene"
(Sharon McLean)

Community based natural resource management

Local level approaches to resource management have existed in many forms, throughout history, all over the world, but are currently experiencing a surge in attention from the conservation community. Incorporating stakeholder community values, experience, social and economic conditions seem to hold a higher potential for success. Participation involves the redistribution and control of resources and power in favour of those who are supposed to be the end beneficiaries of economic development activity. Participation in project design and implementation has the underlying assumption that communities have the wisdom and knowledge to distinguish between economic alternatives in terms of their welfare and that these choices are better than the choices made for them [21, 29]. Research in social science indicates that participation in the management process should improve compliance to regulations [29-34]. Pomeroy, 2003 [12] explains that 'co-management' is a phenomenon only recently to have reached the Caribbean region. In the Caribbean, currently only 'consultative' co-management is in place, which means the government *interacts* with local people, but ultimately makes all the decisions. Not incorporating community participation increases the probability that government decisions will generate adverse socio-economic impacts of a greater magnitude than those that would have occurred in an open deliberative process [21, 35].

In Helene the desire to manage their own coastal and marine resources is strong and might be one approach for mitigating the potential social and economic impacts

BOX 12

*“All of us here
will work united
to earn something
– to help out with
life”*

(Cheryl Diaz)

identified by the SocMon (Box 13). Without a history of past environmental management Helene would be the perfect case study for truly participatory management. The boundaries are easily delineated, resource rights are comparatively well defined and there are few stakeholder groups. Another advantage to CBM for the MPA in Helene is the difficulty outsiders face trying to organise meetings due to expensive and unreliable communication, high travel costs and low community participation.

Communication between the regulatory authority, local municipality and the management groups will be most important and tricky aspect of co-management.

Pomeroy 2003 [12] believes a “shared recognition of a resource use problem” is crucial to successful cooperation between resource users. As demonstrated previously this, shared problem recognition is not obvious from the statistical data: coastal resources are perceived to be in good condition and very few coastal threats or problems were identified. However, there is a definite feeling among the community that resources have declined over the last 20 years and will continue to do so under increasing population pressure. In the instance of marine resources, it is recognised this is caused by overfishing and bad fishing practises, and there is a shared desire for external assistance and the introduction of community enforced rules to mitigate these impacts.

Although the survey results suggest strong support for CBM the reasoning behind the answers has more to do with their lack of confidence in the system, a distrust of local government and current lack of representation in decision making, than confidence in their own abilities to successfully manage the MPA. Trust and transparency are important issues; transparency is immediately increased by following an open participatory process leading to an atmosphere of trust. People feel like they have

been let down in the past, by the Government, especially local Government and their own community leaders. People feel strongly that any funding should not go through local Government and suspicion is even felt towards the Patronato, who people claim, have misused funds in the past.

It is important that the management process is equitable and responsive to changing needs. In its current position Helene is a weak stakeholder. Before this study PMAIB was not even following a consultative, let alone, participatory process and the community had no knowledge of the Government's plans. Within the community itself there are stronger and weaker groups; access to communication, credit, work opportunities, family ties and ethnicity combine to increase or suppress power within society. Restricted access to resources will have an inequitable impact negatively skewed towards the poorest groups e.g. a ban on hunting. The more vulnerable stakeholders need to be able to enter the management process on an equal standing.

Any form of co-management requires a considerable contribution of time and effort and a level of competency that people do not necessarily feel they possess. People were supportive of CBM based on the strength of feeling against having rules imposed on them, rather than the desire to do it themselves. Most people underestimate the work involved and can not afford to contribute the required human capital. There are few natural leaders, and those that are predisposed to the position are already working hard on other community projects. If management responsibilities are desired and devolved to local groups, there needs to be a significant input of training and resources, so that the task does not become an impossible burden. Previously established fishing groups on Helene struggled from lack of managerial experience. PMAIB should run environmental awareness and any other training programmes deemed necessary and help influence the path of the management but it must be up to the community to set their own agenda based on their own set of priorities if it is to be truly co-management. CBM groups will require assistance identifying which aspects of the management job they can handle and prioritising actions.

Key Findings - MPA

- People on Helene support a MPA *if* it creates more employment opportunities.
- The majority of perceived advantages of a MPA are economic (rather than environmental) and the majority of the disadvantages are social.
- Introduction of fishing restrictions will force people into alternative livelihoods and put greater pressure on forest and mangrove resources as people fall back on farming, hunting and construction.
- People see the expansion of tourism to Helene as inevitable and therefore 90% of respondents support this form of development; however, this is based on very little direct experience of tourism, its opportunities and problems.
- The main concerns with tourism are: that it has proven impossible to control on Roatan worsening environmental and social problems and the same will happen on Helene. How development will be regulated needs to be addressed more comprehensively in the management plan.
- Development options, such as aquaculture and sustainable fisheries, should be seriously considered alongside tourism.
- The idea of CBM is strongly supported on Helene. With training and financial assistance from the Government, CBM has the potential to foster an attitude of stewardship through a management process that is truly participatory.

vii. Critique of SocMon Methodology

Bias

All attempts were made to reduce bias from the survey nevertheless there will always be an element of bias that must be acknowledged.

Consultant: The consultant came from outside the community and the analysis may have been biased by educational / cultural differences and how answers were interpreted. The consultant was also associated with a conservation organisation on the island before working on the SocMon and people may have answered questions according to what they thought the consultant wanted to hear rather than strictly their own opinions.

Survey assistants: Answers may have been effectively filtered by interviewers leaving out details not deemed as important. Having no previous experience in social surveying, listening, recording details, writing and interviewing, results may vary in quality.

Respondents: Not everyone agreed to take part in the study and their views may not be accurately represented by the results. People may not have fully understood the questions and answered based on a misinterpretation. With the response graded questions people tended to agree with the positively phrased and get confused by the negatively phrased questions.

Questions and statistics: Phrasing of qualitative questions may lead to misunderstanding or be based on incorrect assumptions. Quantitative results may oversimplify complex responses. Both approaches may obscure respondents' opinions through bias and misrepresentation and fail to adequately represent views.

Overcoming Bias

The aim of the study was made clear at each interview, and the interviewer heavily stressed that participants should answer whatever they felt appropriate, which was

recorded in full. Survey training was given to local assistants in interview techniques and data recording, stressing the importance of listening without leading people to an answer. It was thought that the benefits of participation by local interviewers outweighed the problems associated with their lack of experience. The consultant lived in the community for a year which allowed for a deeper understanding of the culture and led to community acceptance as an independent representative. A pilot study allowed questions to be refined / rephrased to increase understanding. Good representation was ensured by including almost the entire island in the study. Interviews were cross checked and triangulated through group discussions and questionnaire structure.

Limitations

Socioeconomic monitoring based on SocMon provides a useful summary of the current situation in a community that can be used to inform coastal management however, it does not provide answers to all questions important for coastal management. The priority indicators chosen at the outset of the project determine the path the research takes and it is important that these are carefully thought through as time and resources often limit the extent of work that can be achieved.

The research is only as accurate and thorough as the people conducting it. Adequate training and quality control measures are time consuming. Increased participation although desirable from a managers perspective may require more time and effort than people are prepared / can afford to give. Simplifying questions to the point they are fully understood may mean they lose some of the detail / subtly of the original line of questioning and does not produce the warranted response. Semi-structured interviews are the most fruitful, however, they are also the most time consuming and require good interviewing skills.

Some of the economic terms used are hard to translate e.g. ‘coastal resources’ but overall the method and guidelines are clear, easy to use, highly adaptable and easily reproducible.

7. RECOMMENDATIONS

Would the community of Helene support a MPA?

Yes, if the objectives of the MPA were compatible with the community's desire for increased employment opportunities.

What would be the major challenges in introducing the MPA?

How could these obstacles be overcome?

Listed below are 7 anticipated challenges with introducing a Marine Protected Area on Helene and suggested recommendations.

Challenge 1: No perceived need for coastal management

Resources are perceived to be in good condition and people do not feel a strong need for coastal management. Social and economic concerns prevail; few job opportunities, lack of electricity, expensive education and drug and alcohol related problems. Either the MPA will have to raise awareness about the necessity for environmental protection or the marine park will have to address the social and economic concerns. Coastal management without community support is doomed to failure.

Although the community does not perceive the environment as under threat it does recognise that marine resources are declining and attributes this to overfishing and bad fishing practises. This is a good first step that can be capitalised on by PMAIB with education and awareness initiatives, motivating and encouraging people into action. If the marine park is to be successful connections between a healthy environmental resource base and successful economic development need to be made clear.

PMAIB could inspire people by showing examples of successful coastal management. In one interview, Pastor and fisherman Elbert Rich described how he used to fish at Cayos Cochinos, where conch and lobster were plentiful, until he got his gear confiscated. This led him to the opinion that the MPA might be able to increase the amount of conch and fish in Helene and so he supports the idea. PMAIB could easily organise a trip to Cayos Cochinos as part of an educational initiative and encourage discussion between the fishermen about the impacts of the MPA.

Challenge 2: Enforcing regulations

The community does not currently enforce any Government or informal environmental regulations and introducing regulation into an unregulated society will experience strong resistance, especially from the illegal economic sector. Even upholding existing legislation will be difficult without full community cooperation, or investment in surveillance, prosecution and penalties. Helene's isolation and poor economy make covering the costs of enforcement more challenging than in West End, where the MPA is supported through local businesses and volunteers.

This MPA is a long term project and needs long term planning regarding enforcement. Inclusion of local communities in the decision making processes regarding their future is generally considered to be central to the success of MPAs in remote regions that are difficult to effectively ‘police’ from the outside. Over time the cheapest and most effective option is community support for the project with community based enforcement. The native Bay Islanders are the custodians of the reef resources in the area and capacity building and CBM can foster a sense of stewardship and improve transparency.

Promotion of existing regulations, and explanation of the reasons for these rules, in light of the Government objectives.

Varied fishing methods allow a range of adaptive strategies when restrictions are introduced which must be taken into account e.g. gear swap to line fishing leading to increased pressure on small pelagic species.

It would be beneficial for the community to have a link to independent legal advise and assistance to settle potential disputes with outsiders, especially in face of the powerful pressures from development, as currently the ‘internal’ justice system on the island is insufficient to deal with this

Challenge 3: Communication

Effective communication between stakeholders and the policy makers given the limited access, cost and disproportional expense to the community.

PMAIB needs a point of contact on Helene as the CBM process is reliant on the ability to effectively communicate with PMAIB. Existing plans, reports and literature need to be made available in English and Spanish and be made accessible through presentations and workshops. Funding given to cover travel expenses from Helene to French Harbour when necessary.

Challenge 4: Sustainable development

Development that is economically, socially and environmentally sustainable and that does not worsen current social and environmental problems.

The management plan should consider with equal zeal the costs and benefits of alternative development strategies, in discussion with the community, based on the most up to date information and monitor the impacts of development within the framework of a management program that is responsive to change.

Challenge 5: Potential conflict areas

Potential conflict areas have been identified as: prohibiting illegal activities, speargun fishing, mangrove cutting, drug running and hunting; restricting access to traditional fishing grounds; arguments over future job opportunities; conflicts over land tenure and fishermen from outside the area using the resources.

Conflict can be reduced through zoning, participatory management, identifying problems early enough as to prevent them, iterative regulation introduction and having forums for problem / conflict resolution.

Challenge 6: Alternative employment for displaced fishermen

In a society that has extremely limited employment opportunities, restricting access to one of the largest labour sectors, fishing, will cause hardship.

Development that provides alternative livelihood opportunities will encourage people away from fishing, however, development requires investment. Growth should be encouraged using the skills and social capital, already found on Helene.

The island has a high level of education and strong vocational skills: people that have studied tourism to college level; people with IT and secretarial skills, carpenters, mechanics, builders and people with specialist local ecological knowledge. Fishermen and boat captains have an expert knowledge of the sea and could potentially retrain in to the tourism industry as dive masters and recreational boat captains. Examples of environmentally friendly forms of tourism that could be capitalised on include: cave tours, crocodile watching in the mangroves, a turtle sanctuary and iguana / parrot farm. Women could easily be trained in embroidery and handicrafts to compliment the traditional jewellery they already produce. An internet café could play an important role in allowing people to access educational material, stay in contact with the large number of friends and family that are forced to migrate off the island and aid marketing and advertising of small businesses.

Challenge 7: Skewed costs and benefits of regulation

Regulations affect groups in society differently: the wealthy are able to capitalise on investment opportunities and the poor with restricted access to essential resources become poorer. The MPA will disproportionately affect the poorest in the community as the rich are able to adapt more easily. Development that widens the gap between the rich and poor is undesirable. The benefits accrued by sustainable environmental management need to be equitably distributed. Unlike outsiders, the lack of access to credit / financial institutions on Helene means the community may not be able to make the most of available opportunities.

Throughout Honduras NGO and Government organisations exist that provide microfinance for small businesses. These services need to be extended to Helene. Compensation could be given to cover short term losses. Economic tools can be used to prevent capital flight and ensure profits are not lost from the local economy. Discussion is necessary with the community to find an equitable way for benefits to be pooled and redistributed.

Is community based management a feasible option?

Potentially yes, CBM is the best solution to many of the challenges listed above (with technical support, financial contributions and long term guidance from the Government). Community based management is already happening on Helene with the School Groups.

CMB is necessary to alleviate the high communication and enforcement costs - especially given that the Municipality of José Santos Guardiola experiences severe financial and technical limitations that prevent effective control. The participation process promotes stewardship and reduces conflict.

CBM would require:

- A flexible schedule of meetings based around the community's commitments e.g. the fishing / farming seasons; reimbursement of costs to attend meetings away from Helene; representatives of all interest groups. Training in participatory management: how to participate effectively, negotiation techniques, dispute resolution, how to structure a group and set priorities, speaking out, finding funding, accounts / bookkeeping, basic marine, coastal and terrestrial ecological training.
- Demonstrations on how CMB can work e.g. trip to Cayos Cochinos and West End to discuss the MPA with local stakeholders, guided tour after an ecological talk pointing out examples of environmental damage, visit to Mangrove Creek (an excellent local example of eco-tourism that utilises environmentally sensitive wind / solar power, compost toilets and landscaping techniques); a discussion of successful CMB in fisheries management e.g. lobster grounds in Mexico.
- An initial project that is easy to tackle to build confidence in the process.

CMB needs to be discussed between the community and PMAIB to establish the validity of the approach. There are guidelines for developing a co-management partnership in “Guidelines for Marine Protected Areas” by the IUCN 1999 [36].

Are there any other issues that need to be looked at during this process?

The overlap between social requirements and environmental priorities is an easy way to start the process of sustainably managing coastal and marine resources:

1. Sewage disposal
2. Waste disposal

3. Electricity – financial and technical assistance to install solar panels which would reduce reliance on expensive gasoline and cut household expenditure.
4. Make already established ‘Standards of Conduct’ e.g. the Standards and Codes Taskforce (SCT) for diving and snorkelling, and guidelines on environmentally friendly building practises (especially where development has started on Barbarella) widely available, to reduce sedimentation and mechanical damage to the reefs.
5. Fisheries management for lobster and conch, the high value products Helene relies upon.
6. Unreliable fresh water supply – installing storage tanks and dependable pipe system would reduce reliance on ground water.

Government strategy (PMAIB)

The MPA needs to have clear goals and objectives so progress can be measured. If those goals are purely environmental i.e. to protect the coral reefs and not in terms of economic sustainability, then the MPA will falter. People need to be at the centre of the management plan and the plan needs to have a strong vision for the future.

Issues that need to be addressed in more detail include:

- How to overcome the current environmental policy failures: cumulative effect of development, high level of law infringement, inadequate resources to detect violations, low penalties, lack of technical expertise required to make fully informed planning decisions [20,21].
- Lack of economic strategy, the management plan needs an economic feasibility study. Economic analysis can help give a value, either in monetary terms or a defendable qualitative manner, which allows decision makers to identify all relevant factors and then assess the costs and benefits to society of alternative management strategies.

- Social data needs to be incorporated and social objectives formalised in light of new data. Continuation of socio-economic monitoring so that success / failure can be assessed and as views and opinions change through the process they are still taken into consideration so that the plan becomes organic and there is a provision for feedback.
- How community participation can be incorporated into the plan and what the long-terms aims of CBM are. Identify the next steps and how the day to day management of the park will occur. How the challenges identified can be overcome. Structure the plan for incremental implementation.
- How benefits accruing from the use of local natural resources can be reinvested in the community with special emphasis on poorer and marginalised groups, which will act as a further incentive towards environmental management aims and as compensation for restrictions.
- Information gaps for future training: aims of MPA's, tourism, goods and services of environmental resources, rubbish disposal, eco sanitation, aquaculture development, business development; accounts management, marketing and advertising.
- Incorporate local environmental knowledge (LEK) into the management plan e.g. grouper and snapper spawning sites (north of Barbareta) and update the plan regularly – in the last 12 months reefs have been seriously degraded by hurricane and bleaching damage.

General PMAIB recommendations:

- Investment in human capital, training and education for Helenians.
- Provision of training and technical assistance on environmental legislation to lawyers, the police and judicial branch members so they can feel confident

about prosecuting offenders. Training to planning authorities on environmental management and planning concepts and permit letting.

- Updated real estate census and registration of properties done with consultation.
- Work more closely with other Central American countries and exchange experiences about successful community run marine protected areas.

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Website Links

Coral Cay Conservation: www.coralcay.org

NOAA: www.noaa.gov

PMAIB: www.islasdelabahia.org

SocMon: <http://iucn.org/themes/wcpa/biome/marine/socioeconmanual.htm>

Mesoamerican Barrier Reef Network: www.mbrs.org

Economic and Social Statistics

Banco Central de Honduras: www.bch.hn

InterAmerican Development bank: www.iadb.org

Comision Economica para America Latina y el Caribe: www.eclac.org

Marine Protected Area Management

UNEP – Caribbean Environment Programme: www.cep.unep.org

Caribbean Coastal Marine Productivity Programme (CARICOMP):

www.uwimona.edu.jm/centres/cms/caricomp

Reef Environmental Education Foundation: www.reef.org

Biodiversity Action Network (BIONET): www.igc.org/bionet

ReefBase: www.reefbase.org

IUCN: The World Conservation Union: www.iucn.org

Marine Conservation Biology Institute: www.mcbi.org

World Conservation and Monitoring Centre: www.wcmc.org.uk

General References

www.projecthonduras.com – links to social networks.

www.honduras-resources.com

www.roatanet.com

www.bayislands.com

www.Lanic.utexas.edu/la/ca/Honduras - links to websites covering all aspects of Honduras

APPENDIX

Appendix A: Survey Questionnaires

- Questionnaire 1 – Household Demographics
- Questionnaire 2 – Coastal and Marine Activities
- Questionnaire 3 - Perceptions

Appendix B: Survey Assistants

Appendix C: Migration Results

Appendix D: Additional Pictures

Appendix A: Questionnaire 1 - Household Demographics**SocMon Demographic Questionnaire****Q1.** Name:**Q3. (S3)** Ethnicity:**Q2.** Location:**Q4. (S5)** Religion:**Date:****Household code:**

How many adults stay in this house?

SECTION 1: Demographics

Q1	Name	Q5 S2	Gender M/F	Q6 S1	Age	Q7	No. of children	Q8 S4	Last Grade at School	Q9 S6	Languages	Q10 S7	Occupation
Q11 S9	Household's main sources of income with the most important first...												
Q12	Household's estimated weekly income / or / if you had the opportunity what kind of business would you like to develop?												
Q13	What are the three major problems facing the community?												
	1.	2.	3.										
If necessary would you be prepared to answer more questions later to help with the study?													

Appendix A: Questionnaire 2 - Coastal and Marine Activities

Coastal & Marine Activities Questionnaire

Name: Date: Location:
Household Code: Occupation:

Q1a Do you know what a marine park is?

When the number of people increases more and more people rely on the environment; fish to eat, wood for houses and fires, fresh water to drink, the sea to get rid of sewage and pollution, beaches for fun.. so, the more people the more stress on the environment... the environment needs to be healthy so it can support everybody. A Marine Park is a way to help the environment recover. There are rules and restriction on fishing, cutting down mangroves and wood and stopping pollution so the wildlife can recover and a good marine park tries to create jobs based on this healthier coast.... (Only use when really struggling)

Q1b. What do you think about the waters around Helene and Barbareta being turned into a marine park?

In favour or not in favour

Q2. What are the advantages and disadvantages of having a marine park?

Benefits

Disadvantages

Q3. How do you think a marine park around Helene will affect you?

Q4. Who do you think should manage the marine park? Who would want to do it?

.....

Q5. What do you do that uses the coast?

Coconut oil making, farming, tourism, collecting shells/coral to sell, iguana or other hunting, enjoyment, collecting sand for building, wood for construction / carpentry. (not baking or hair). Put in order of importance.

Coastal Activity	What they use/collect Goods and Services	How they collect it Method Used	Helene/Roatan/Mainland Market	Home/sale Household uses
E.G. Fishing	Grouper	Line	Regional	Sale

Q6. Put these things in order of importance to you: fresh water, coral reef, mangroves, forest, tourism, seagrass, fish, coconut trees, good soil.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

Q7. How would you describe current condition of these things on a scale from very good (5), good (4), not good not bad (3), bad (2), to very bad (1).

Resource	Mangroves	Coral Reefs	Fresh Water	Forests	Seagrass	Fisheries	Beaches	The Sea
Score								

Q8. Are there any problems related to the coast?

E.g. hard to navigate, other fishers coming in, not enough wood, too much rubbish?

Q9. What do you see as the solutions to these problems?

Q10. What are the top three threats to the health of the coast?

E.g. all the things we've been talking about, the ocean, mangroves, beaches etc.

1. 2.

3.

Q11. What are the top three threats to fishing?

1. _____ 2. _____

3.

Q12. Is anyone in your family a member of an organisation or group?

Name	Group	Position	What it does	Description How long it has been running? How regularly they meet? How many members?

Q12. What percentage of the people in the group are men and women? Men:

Women:

Q13. How many people have left the family to go and live in another part of the country or abroad between 1st January 2005 and 1st January 2006?

No.	Name	Sex		Age	Place of Origin	Reason for leaving			Name of place they went
		Male	Female			Work	Family	Health	

Thank you!

Further Notes

Appendix A: Questionnaire 3 - Perceptions

Perceptions: Please place a cross on the line where your opinion lies....

Name:

1. Coral reefs are important for fisheries

Strongly Agree

Strongly Disagree

2. It won't make any difference if we burn and clear the forests

Strongly agree

Strongly disagree

3. It is impossible to fish out all the conch

Strongly Agree

Strongly Disagree

4. I would sell my land to foreigners if I could get a good price

Would Definitely sell

Definitely wouldn't sell

5. How wealthy do you think Helene is compared to Roatan?

Very poor

Very Rich

6. How wealthy do you think Helene is compared to the rest of the world?

Very poor

Very Rich

7. How many times have you been to West End / West Bay?

Tourism the same as West End should be developed on Helene

Strongly Agree

Strongly Disagree

8. The development of tourism would cause problems

Strongly Agree

Strongly Disagree

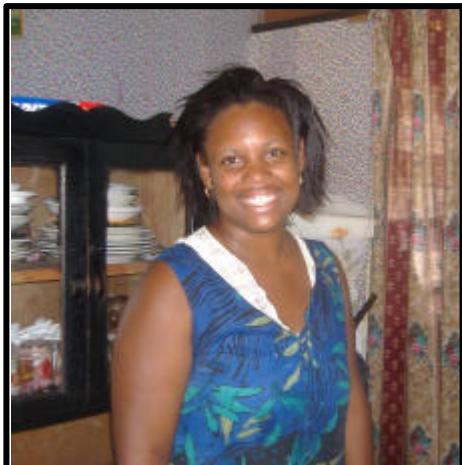
9. How often do you go in the sea? (Fishing, swimming)

Fishermen only...

If you couldn't go fishing any more how would you earn money?

Appendix B:

Survey Assistants



Name: Kiani Pouchie, 25
From: The Point



Name: Shannel James, 18
From: The Pond



Name: Fordy Pouchie, 35
From: The Point



Name: Elizabeth James, 32
From: Mangrove Bight

Appendix C: Migration

Name	Sex		Age	Place of Origin	Reason for leaving			Place Currently Living
	Male	Female			Work	Family	Health	
Richard Gordon	1		45	Helene				Florida
Carolyn Gordon		1	37	Helene				La Ceiba
Gina Gordon		1	34	Helene	1			Cayman Islands
Dixie		1	25	Helene	1			La Ceiba
Aline		1	46	Helene		1		La Ceiba
Edwardo	1		21	Helene	1			Barbareta
Orleen		1	?	Helene		Husband		California
Monica		1	18	Helene	School			La Ceiba
Mario	1		16	Helene	School			La Ceiba
Erica McKenzie		1	23	Helene	1			Coxen Hole
Julie McKenzie		1	24	Helene	1			Coxen Hole
Maria McLaughlin		1	21	Helene	1			USA
Diandra Pandy		1	22	Helene	School			French Harbour
Owens Pandy	1		20	Helene	School			Coxen Hole
Pamela		1	20	Helene		1		Diamond Rock
Bruce James	1		23	Helene	1 – Carpenter			Cayman
Marlon	1		29	Helene	1 – Electrician			Cayman Islands
Marvin	1		25	Helene	1 – Mason			Cayman Islands
Francine		1	13	Helene	School			Diamond Rock
Jarina		1	13	Helene	School			La Ceiba
Fransie		1	15	Helene	School			Oakridge
Tyron	1		20	Helene	Bartender			Oakridge
Essmy		1	13	Helene	School			Oakridge
Shemil	1		10	Helene	School			Politily Bight
Brendie		1	15	Helene		1		Bentley Bay
Brian	1		17	Helene		1		La Ceiba
Kimberly	1		18	Helene	School			Coxen Hole
Sharla	1		29	Helene		1		Coxen Hole
Janneth	1		32	Helene		1		Coxen Hole
Analee		1	28	Helene		1		Coxen Hole
Leorna		1	45	Helene		1		Coxen Hole
Luvie		1	24	Helene		1		Coxen hole
Stephanie		1	20	Helene	School			Coxen Hole

Darla		1	16	Helene	School			Punta Gorda
Kenny	1		34	Helene	1			Punta Gorda
Arline		1	23	Helene		married		USA
Shenaidie		1	15	Helene	School			La Ceiba
Sherianan		1	11	Helene	School			La Ceiba
Sharanie		1	9	Helene	School			La Ceiba
Kevin	1		19	Helene	Car driver			Coxen Hole
Debbie		1	12	Helene	School			La Ceiba

Number of people interviewed: 60

Number of family members who had migrated: 41

Percentage of people who had had 1 or more family members migrate: 44%

Average age: 23 years

Male: Female: 12:29

Appendix D:

Additional Pictures



Victor and Jossline James.
Fish trader and shop owner in Sico



Cooking coconut oil using a wood fire (on top of a conventional oven).



Household interview.



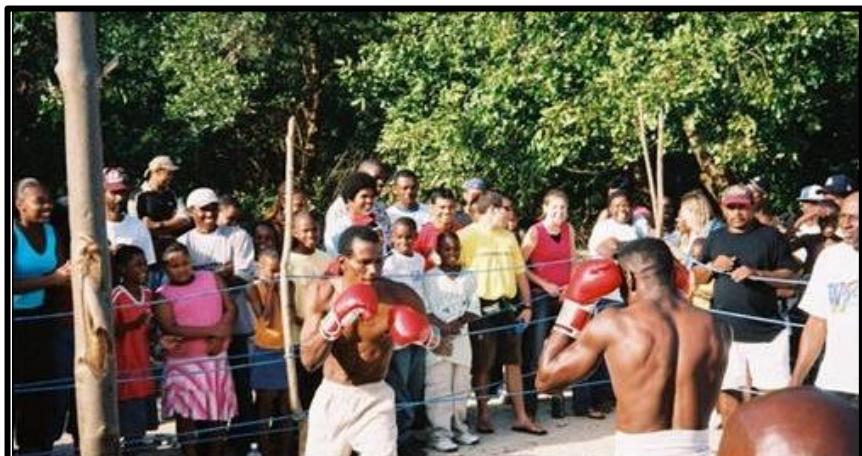
Andreas Forbes (Calix) constructing
a traditional wooden dori.



Flamingo Tongue.
Spectacular coral reefs surround Helene.



Bentley Bay.
Forest cleared for housing.



Community organised
boxing match.



Gloria Bodden.
Housework takes many hours.



View across the lagoon to
Barbareta.



Mangrove Bight.
Mangroves cleared for housing.