COMMUNITY MANAGEMENT OF PROTECTED AREAS CONSERVATION PROJECT (COMPACT)

COMMUNITY ASSESSMENT
FINAL DRAFT REPORT

Submitted to Programme for Belize
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Final Draft Report

TABLE OF CONTENTS

Final Draft Report

Preface

Doing this assessment for the Community Management of Protected Areas Project (COMPACT) has been a rewarding challenge. As with similar studies of this nature, there had to be discussions and compromises between the agent giving the contract– in this case Programme for Belize – and ourselves. The negotiations took place amicably with all sides agreeing that we would draft the two study instruments, implement them in some communities at the start of the study, train Ms. Rene Ogaldez to take over in the rest of the communities, do the analysis, and draft this final report.

The other part of the challenge had to do with COMPACT itself. Coastal communities in Belize vary from those that are at the forefront of economic progress to those that have been completely overlooked by the march of development during the past three decades. Any development programme has to be aware of this wide range, much more one predicated on community initiative. In all the communities we visited there was enthusiasm for participation in COMPACT. Obviously streamlining projects for funding will be a daunting task.

Our aim in the study was to spotlight some background issues that the managers of the Project funds will have to keep in mind to maximize how much can be done. In doing so, we have attempted to project the views that residents of the study communities shared with us.

I have tried to make the text of the report as concise as possible, while not sacrificing on the significance of the findings. To facilitate extracting some main statements useful for quick analysis, I have included an executive summary. I have also underlined some of the text in the body of the report that the reader may want to isolate as being potentially helpful for COMPACT consideration.

There are many persons to thank for their help. I start with Timmy Palacio and Dr. Vincent Palacio who assisted at the early stages of conceptualizing the study. Ms. Rene Ogaldez proved to be a quick learner and helpful assistant in the field. No word of thanks is adequate for the scores of persons in the field who graciously accommodated us, especially the liaison persons.

Ms. Seleni Matus and Mr. Marion Cayetano of Programme of Belize together with colleagues from BEST and ANDA gave support to help us get the work done.

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Belize City
January, 2002

COMMUNITY MANAGEMENT OF PROTECTED

AREAS CONSERVATION PROJECT (COMPACT)

Executive Summary

This consultancy is to do an assessment of seven coastal communities to provide base line information on their use of marine resources and their readiness to engage in projects to be funded through the Community Management of Protected Areas Conservation Project (COMPACT). Under sponsorship from the United Nations Fund and the UNDP-GEF/Small Grants Fund, the COMPACT is to provide grants of up to US $50,000 each to projects concentrated around the seven World Heritage Sites located along the Belize Barrier Reef. Its lifetime is from August 2001 to February, 2003.

In this executive summary, I spotlight the specific objectives of the consultancy and how we have addressed them.

1. To discuss coastal communities' cultural, economic, and social uses of marine resources; and their role in the economic development of the coastal zone. Culturally, there is deep traditional knowledge of marine and coastal ecosystems within all the communities. It is rooted mainly in fishery practices that have been done for several generations. With the demand for foreign exchange within the macro-economy during the past three decades, tourism has gained overwhelming ground over fishery in all the communities, except Sarteneja. The unfolding transformation has profound implications on several aspects of the socio-economy. They include changes in gender specific roles, the definition of marine resources as national resource and how to take advantage of opportunities forthcoming from COMPACT and other sources, and generating these opportunities so that all communities can take advantage. Finally, it brings to light the relative degrees of helplessness of all the communities, especially as they have minimal social infrastructure implicit in project development and implementation.

2. Identify and prioritize threats to the Belize Barrier Reef System. Given that COMPACT aims to have communities minimize threats to the Reef while promoting biodiversity, a primary part of our exercise was to identify such threats and their perpetrators. There were differences by communities. In San Pedro and Belize City, the three most frequently mentioned were dredging, overfishing, and damage resulting from tourism recklessly or through ignorance. South of Dangriga to Punta Gorda, they were gillnets, overfishing, and chemical pollution. The perpetrators include fishers from Belize and the neigbouring countries, tour operators/guides, and tourists themselves.

3 and 4. Discuss existing interventions that can be implemented by communities to mitigate threats and identify potential partners for COMPACT. In terms of intervention by communities, it is plain that many of the threats are not directly their doing. These include dredging, chemical pollution, and those associated with tourism. Overfishing, gillnets, removing coral for jewelry, and anchoring are threats that respondents conceded they engaged in. The community members prefaced their response, however, by admitting that they have had to co-exist with reef systems for generations and that they would not willfully destroy them for they know their usefulness. It is to

them an economic problem, whose solution is in generating alternative sources of income that will take them away from the Reef and other endangered marine resources. All communities easily identified such alternatives, which they would be willing to engage in. They are discussed in the body of the report, more especially in the part on recommendations toward the end.

The wherewithal to initiate these alternatives is another problem, whose solution inevitably lies through partnership between community groups and intermediary organizations that could assist with technical, financial, and moral resources. There are in the south these types of organizations formed around Marine Protected Areas. They include Friends of Laughing Bird Caye, Toledo Institute for Development and Environment (TIDE) linked to the Port Honduras Marine Reserve, and Toledo Association for Sustainable Tourism and Empowerment (TASTE) linked to the Sapodilla Cayes Marine Reserve. By and large they are young, inexperienced, and without steady financial backing. In the north, communities do not have such partnership. Rather, there are NGO's that operate on a piecemeal basis and also rely heavily on outside funding. These very weak links are a major problem that will affect the throughput of COMPACT in its small projects.

COMMUNITY MANAGEMENT OF PROTECTED AREAS CONSERVATION PROJECT (COMPACT)

Final Draft Report

Introduction

The Subcommittee co-ordinating the Community Management of Protected Areas Conservation Project (COMPACT) requested that we do an assessment of selected coastal communities. The Subcommittee made up of Belize Enterprise for Sustained Technology (BEST), Association of National Development Agencies (ANDA), and Programme for Belize (PfB) based its selection in keeping with the mission of COMPACT. It is to demonstrate that communities, which use marine resources in the area of the Belize Barrier Reef Reserve System (hereafter referred to as 'the Reef') could engage in projects that minimize threats to the Reef, while promoting biodiversity. The aim of our assessment was to provide baseline information on their use of marine resources and their readiness to engage in projects to be funded through COMPACT. This information would feed into the overall country strategy of COMPACT, for which Programme for Belize was contracted.

More specifically the objectives of the assessment as spelled out in the contract with the Co-ordinating Subcommittee were:

1. To discuss coastal communities' cultural, economic and social uses of marine resources, and their role in the economic development of the coastal zone
2. Identify and prioritize threats to the Belize Barrier Reef Reserve System
3. Discuss existing interventions and identify potential interventions (that link sustainable livelihood with conservation of marine resources) that can be implemented by communities to mitigate identified threats to the Belize Barrier Reef Reserve System, and
4. Identify potential Community Management of Protected Areas Conservation Project (COMPACT) partners and their capacity to implement potential community-based projects.

Sponsorship for COMPACT derives from the United Nations Fund and the UNDP-GEF/Small Grants Fund working within the larger goal of increasing protection and biodiversity in "World Heritage Sites and globally significant coral reefs" (from the Project Document). For the Belize portion, it was decided that five to fifteen community-based projects would receive a total of up to US $50,000 each. The projects should concentrate on the following seven World Heritage Sites – Sapodilla Cayes Marine Reserve, the Laughing Bird Caye National Park, South Water Caye Marine Reserve, Glovers Reef Marine Reserve, Half Moon Caye Natural Monument, Blue Hole Natural Monument, and Bacalar Chico National Park and Marine Reserve. The lifetime of COMPACT is from August 2001 to February 2003.

This report elaborates on a preliminary mid-term report we submitted November 4th, 2001. It ends with recommendations for community projects.

Methods

Under methods I discuss the two primary means of data gathering, some bibliographic sources that provided background information, field logistics, and a broader range of challenges underlining COMPACT as a development programme within Belizean society.

The bulk of our data came form two main instruments, which spell out the details of a questionnaire and focus group discussions. We agreed with the Co-ordinating Subcommittee that the persons selected to be interviewed using the questionnaire instrument and participate in the focus group would come from the following categories of users – fishers, tourism, governance, education, civil society, elders, and mass media. Table 1 outlines the complementary scope and aims of the two instruments and Appendix 1 includes a list of the participants for both.

Table 1
Aims of the Survey Instruments

Questionnaire: specific Community Issues	Awareness of: ➢ Reef vs. other marine features ➢ Interconnectivity between Reef and other features ➢ Primary successful actors in coastal resources ➢ Potentially successful actors and their constraints ➢ Traditional uses that could be revived ➢ Link between indigenous culture and economic activities ➢ Roles for the small person in Marine Protected Areas (MPA's)
Focus Group: More generalized issues at Community level	Types of stakeholders Stratification among them Possible conflicts and how they are resolved Role of MPA's Where men, women, and youth fit into potential projects

The questionnaire was designed for laypersons to provide information from their designated perspectives as users. As a result, most questions were open-ended. Others suggested possibilities but gave the respondents opportunity to include his/her answer, should it not be included. Furthermore, the questionnaire maintained a logical order moving from one heading to another in a non-threatening manner but acquiring as much data with the least intrusion into privacy. Appendix 2 shows the logical order within the t body of the questionnaire. The average implementation time lasted between half an hour and forty-five minutes for each respondent.

Some questions required factual answers, such as those about one's biography and socio-demography. These are found under subheadings 1 and 7 (see Appendix 3). The others elicited one's knowledge of the physical environment, with specific reference to the sea, coral reefs, and marine protected areas. A third type of question asked one's impression about social values, cultural attitudes, and the socio-economy. This segment struck at the core of social and cultural differences separating one community from another and indicating prevailing inclinations toward changes in behaviour.

Within the literature on development studies there is some reluctance to use questionnaires in field assessment (see Chambers 1983: 47-74). The criticism is that they can be costly in designing, implementation, and analysis as well as being time consuming. Furthermore, the criticism comes as a way of contrasting questionnaires with more intuitive and participatory assessment measures covered under various kinds of rapid appraisal techniques. The advantage of questionnaires, however, is that after receiving training, fieldworkers can implement them with minimal supervision. It applied in our case. I drafted the questionnaire and trained PfB staff person Ms. Rene Ogaldez how to use it. After field training, she was able to interview respondents in some communities, thereby cutting down on cost as well as ensuring standardized results. I assume responsibility for the analysis of the field data and the drafting of this report.

While the questionnaire provides information from one individual at a time, there is need to arrive at what community members as a group are saying. It became the function of focus group sessions. We had one in each community lasting between two and three hours. To make sure that we were covering as many persons as possible within our limited field time, we included in the focus groups persons not already interviewed using the questionnaire but falling within the same categories. The same persons implementing the questionnaire also led the focus group. Both field methods, therefore, became immersion experiences for us within the study communities, including Ms. Seleni Matus –who worked in four communities – Ms. Rene Ogaldez, and myself (see Table 2). We had available as substantial information-base the results of the questionnaire, focus groups, and informal discussions we had with community members.

Any study with such severe time limitations, such as ours, needs to take advantage of whatever supplementary information that is accessible. Before and during the fieldwork, we took opportunity to go over some of the large volume of studies available on marine resources in Belize. I mention some. On the COMPACT itself we had access to the "A Baseline Assessment of the Belize Barrier Reef World Heritage Sites" and other documents from the PfB collection. On studies on the use of fishery resources within Belize and region, we had access to Espeut (1994), Craig (1966), Heyman and Graham (2000 a, b, c); on coastal resource management Brown and Pomeroy (1944) and Palacio (2001); with specific reference to co-management in Belizean marine protected areas McField (2000); on public policy and its implementation Coastal Zone Authority, Management, and Institute (2000); on statistics in tourism Belize Tourism Board (2001); on conservation efforts in marine resources Waight and Lumb

(1999); and on the need for social sciences in the marine studies Savard and Breton (1999).

The fieldwork took place in all communities over two day periods, more often during the weekend between September 15th, 2001 and October 30th, 2001. For each community there was a liaison person, whom we randomly selected to help us and to whom we gave a small stipend. He/she was most helpful in carrying through the field logistics in such tasks as identifying respondents using the criteria we specified, the timing and venues for interviews and focus group sessions, and where we would be staying. More especially we were fully dependent on him/her to guide us through the protocol of community interactions to maximize the level of cooperation we could receive.

In many ways we were the beneficiaries of their good counsel. One recommendation we received was that we should offer stipends to respondents. In all communities we paid $25.00 to each questionnaire respondent and $20.00 to each focus group participant. They were highly appreciated and greatly facilitated our interactions. They also corroborated the level of seriousness on our part and respect for the communities and their information. Table 2 outlines the field arrangement we put in place including the names of liaison persons and respective lead facilitators.

Table 2
Community Field Arrangement

Community	Dates	Liaison Person	Lead Facilitators
Punta Negra/Punta Gorda	September 21-23	Jack Nightingale	J. Palacio & R. Ogaldez
Placencia	September 29-30	Brian Young	J. Palacio, S. Matus, R. Ogaldez
Sarteneja	October 5-7	Conchita Rodriguez	J. Palacio and R. Ogaldez
Dangriga	October 14-15	None	S. Matus & R. Ogaldez
San Pedro	October 19-21	Felix Ayuso	S. Matus & R. Ogaldez
Belize City	October 29-30	None	S. Matus & R. Ogaldez

There were logistical decisions we took that affected the nature of the data. We decided to include Punta Negra with Punta Gorda because of its small population and the fact that Punta Negra residents have been migrating to Punta Gorda, while still fishing in their waters and maintaining homesteads in the village. The 1991 Census figure for Punta Negra was 21 and for 2001 it was 27.

The decision who to select to be respondents in Belize City was one that required much thought. Belize City has a radically different orientation to marine resources compared to any of the other communities not only for being the largest city but also being the largest port in the country. The selection was made based on the respondents' representation in primary stakeholder organizations such as the Belize Audubon Society and fishing co-operatives. In the end Belize City had the least number of respondents but their information content reflected a higher level of expertise compared to the other communities.

Having done the fieldwork, the tasks of analysing the results took over. Because of the small number of questionnaire respondents but the larger proportion of open-ended responses, we went over the variables by hand without the use of the computer. We presented them on tables and eventually in patterns found in Appendix 4 Frequency of Variables in The Study Communities. Ms. Rene Ogaldez was helpful in tabulating the results for the communities in which she was lead facilitator.

The challenge of any study that is community-driven rests in dealing with logistical idiosyncrasies, such as under population and overwhelming complexity. All in all the success of our study rests on producing a substantial baseline on seven communities within the relatively short period of fourteen days, broken into two days for each community. We interacted formally with 88 persons (see Appendix 1) through questionnaire and focus groups, totaling 26 hours for the questionnaire and 17 hours for the focus group sessions. Additionally, we spoke with members of the communities casually during our off-work field time, as well as several times by telephone. The wealth of information derived from the amount of diversified information we amassed. More especially, it arose from the enthusiasm of the lead facilitators, the dedication of liaison persons, and the genuine interest of most respondents to work toward a better economic future for themselves and their children. Finally, also helpful has been our long time grounding in the study of coastal Belize, especially the southern half of the country. Notwithstanding our extensive interest on the coast, this was the first time that we focused on community responses to the use of marine resources.

The Challenges of COMPACT

There is need for a brief profile on the challenges of COMPACT (with special reference to the "community" in the acronym) to appreciate the findings of the assessment, which will follow in the next section of the report.

Since independence in 1981 public policy has emphasized the broadened use of natural resources to become sources of foreign exchange, thereby displacing reliance on monocrop agriculture that prevailed during the colonial era. Fishery and marine tourism

became two of these primary targets as new horizons within the national economy. Belize's endowment in its rich marine/coastal biodiversity – not to mention the Barrier Reef – was a natural watershed for the new paradigm in development policy.

Within the twenty odd years after Independence, there has been steady shift in the way how coastal communities have reacted to the incentives of transforming their socio-economy. One way of appreciating this is to spotlight our study communities. Sarteneja has become a primary fishing village, having recovered from the limited returns from agriculture for the amount of work expended. On the other extreme, San Pedro has made almost a complete threefold transformation from reliance on selling coconuts up to the 1950's, to fishery between 1960 and 1980, and now heavily on tourism (Gordon 1981). Currently it is the community with the greatest diversity in its tourism product.

Table 3
Census Figures for Communities 1980, 1991, 2001

Community	1980	1991	2001
Punta Negra	55	21	27
Punta Gorda	2,396	3,461	4,329
Placencia	334	361	501
Dangriga	6,661	6,449	8,814
Belize City	39,771	44,067	49,040
San Pedro	1,136	1,842	4,499
Sarteneja	1,005	1,365	1,640

Between the extremes of Sarteneja and San Pedro lie the other communities, each having one foot in fishery but anticipating greater participation in tourism. Placencia is closest to San Pedro. The growth in its population within the past three decades is an indication, as the corresponding growth has been in San Pedro, especially between 1991 and 2001. Where tourism has been less, there has been slower growth in population as shown in Table 3.

The aim of this brief profile is to show that within Belize there is the possibility of seeing degrees of economic transformation with the accompanying impacts on coastal and marine resources, including the Reef. The cries of overfishing heard in San Pedro years ago are now being echoed in Punta Gorda and Punta Negra. The impact of larger numbers of users at the Blue Hole Natural Monument is now reverberating on the Reef at South Water Caye, just south of Dangriga. The essential questions of what natural and human resources are the most affected are, of course, specific to given communities; but to a large extent the patterns are homologous.

While the state has been providing opportunities for economic growth at the macro-level, it has done relatively little within the larger realm of social infrastructure to enable the communities to better help themselves. Despite the statutory changes introduced in 1999, local government is still more a name than a reality in which town and village residents still do not have the power to identify their natural resources and exploit them. Besides, there is minimal use of regional and subregional social and

physical planning to help people prioritize and find financial/technical resources for their community development. From our field experience in doing this assessment, many times it was obvious to us that COMPACT was predicated on the target groups having the basic infrastructure to engage in their development. On the other hand, both conceptually and in fact this was remote from reality. In more than one community respondents did not know what a community development project was, much less what they should do toward its planning and execution. The significance of this for COMPACT is the urgent need to provide varying degrees of logistical support to ensure community involvement in the projects. This will become clearer from a discussion of the findings.

The following discussion on the findings gives information about impressions that members of the study communities shared with us.

Findings

The narrative description that follows summarizes results shown in Appendix 4 Frequency of Variables for The Study Communities.

1. **Biographical Data**

This subtopic includes variables found under headings No. 1 Personal, No. 5 Economic, and No. 7 Socio-demographic Data. The variables are gender, age range, livelihood, length of time in the community, household size, ethnicity, and generating income for women and youth.

Almost all of the 35 respondents were born in their respective communities and lived there permanently. A few were returnees from North America and expatriate Americans. The prevailing sources of livelihood were fishing and tourism. A few were teachers and leaders in local government and the mass media. For a list of the respondents see Appendix 1 and for a breakdown of the occupations represented see No. 1 Biographical Data in Appendix 4.

I draw attention to gender for two reasons. One is that the COMPACT emphasizes the involvement of women in projects. The other is the wide spectrum of opinions forthcoming from the communities on gender specific roles in harnessing marine resources. While most of the respondents were males, there were females, especially in Placencia and San Pedro. The presence of the females in answering questionnaires and participating in the focus groups added much to our understanding of their roles. In both Placencia and San Pedro there was overwhelming support for women to take active roles in all aspects of the tourism industry, including acquiring all levels of diving qualifications. On the other hand, in Sarteneja where fishers predominate, a traditionally male occupation taking them away for weeks on end, there was diminished expectation for women involvement. Again, this contrasts with conditions in Punta Gorda, where there is at least one active woman fisher.

With a decided shift toward tourism in almost all the communities, there will be accompanying shift in more women and youth engaging in new domestic and extra-domestic economic activities. This evolving pattern in community social structure is already well established in Placencia and San Pedro. Fishing certainly does not offer such a scope for sustained participation for women and youth.

In questions Nos. 4 and 5 under the Economic Section, we specifically asked, "How do you see women and youth getting more cash income through activities related to the sea?" Notwithstanding the relatively higher profile women have in some communities, invariably the recommendations for women were to become tour guides and do traditional handicrafts and catering. For the youth, there was preference for internship with older persons and to branch into careers requiring further education for qualification.

The implications of these findings are that certainly there are changes in gender specific roles taking place, especially in tourism. However, there will be need for much support for all – men, women, and youth – to prepare themselves psychologically as well as through training opportunities for the new occupational roles that will be unfolding. The evolving roles will also impact on interpersonal relations within the family and the community.

2. The Environment

This segment elicited knowledge on the geography of the sea, coast, the Reef, and marine protected areas. Together these topics spotlight issues that the small person can identify with. There are, of course, other and possibly more pertinent issues but not normally within the direct purview of the smaller person. Here ,I refer to large scale land ownership and real estate speculation, which are significant in areas of high tourist demand. There is hardly any part of the coast not currently under public ownership that is not so affected. Similarly, I make no special case of port facilities together with the scores of ancillary services and industries they provide. Belize has three ports, the largest is in Belize City and the other two in Dangriga and Independence.

2. A. 1 Main Livelihood

In response to the question "What sources of livelihood from the sea do members of this community use", I set aside the following as leads – fishing, water-taxi operator, tour guide, tour-operator, and taking tourists fishing. Respondents inserted others, including fly fishing, going on day trips for sightseeing and snorkeling, serving as captain and crew on tourist boats plying along the coast, bareboating (tourists renting boats and traveling on their own), and game fishing. The fact that all of these additional activities fall under tourism spells the diversification in this field in contrast to fishing.

The answers reveal Sarteneja as the only community concentrating on fishing. They catch their target species – lobster and conch – by diving, setting traps, and using spear guns. These methods prevail among other cash fishers in Belize but certainly not in the dedicated manner and in as wide a geographic area as done by the men from Sarteneja. There are some tour guides in the village but they work at either San Pedro or Caye Caulker, communities with which they share cultural ties.

Only in Belize City did one respondent mention the importance of the port as a main source of livelihood for several persons.

Except for Sarteneja, the communities showed higher frequencies in livelihood for tourism.

2. A. 2 Part of the sea most used

In response to the question "Using the Reef as point of reference, what part of the sea do residents of this community most use for their living", I included the following as leads: close to the beach, about two miles maximum distance; a distance more than two miles but not around the Reef; immediately near the Reef; beyond the Reef in the open seas. Our objective in this question was to arrive at common notions of folk zoning in the use of the sea between the coast and the Reef. To emphasize the folk characteristic we asked a question about the use of the vernacular for landmarks. Our informants said that the commonly known names for cayes – the most often used landmarks - were normally used. These are the same names – usually in English - found on the map. Only in the area of Placencia going south was there mention of fishing drops as landmarks. Most of them had folkloric names. For more information on fishing drops and their names see Palacio (2001).

We found out that spatial differentiation is based primarily on fishing, as tourism is still localized near given sightseeing destinations, many of which are short distances from the communities. Further below we will see that attractive sites are also spreading longer distances away from communities, as tour operators use faster and bigger boats for day excursions.

There is a generalized pattern of distinguishing between in-shore and off-shore fishing areas. In Sarteneja there is the Corozal Bay in front of the village and there is the 'further beyond' or *mas alla* (in Spanish). The former is heavily overfished and the latter is where they do their commercial fishing. In Placencia there is the Inner Channel stretching a few miles to the east and further the Main or Victoria Channel. In the former they fish for the household supply and in the latter they do commercial fishing at drops located nearer the Reef. They catch conch and lobster in both the Inner and Outer Channels.

In Dangriga and Belize City the fishers concentrate on cayes. Due to overfishing, Belize City fishers are now going mostly to the Turneffe Islands, a distance of 35 miles crossing the Reef.

In Punta Negra, fishers can still get good catches short distance from the shore. It is also the case for Punta Gorda fishers. Because there are fewer cayes east and south of Punta Gorda, the fishers rely more on favourite drops as landmarks.

Generally fishers look for seagrass beds and rock outcrops for various species. They do recognize a wide variety of rock outcrops, starting from a few isolated patches to extended ranges nearer some cayes, to the atolls mainly around Glovers Reef, Turneffe Islands, Lighthouse Reef, and eventually the Barrier Reef. It is lobster fishers who most often use the Reef, including the windward portions. Conch fishers, on the other hand, look for them in sand spots.

We were able to get the general range of fishers by communities. In Punta Gorda they cover a maximum radius of five miles from the town, stretching from the Snake Cayes and swinging south a short distance from the town. In Punta Negra the furthest they go is a distance of 30 miles to the Sapodilla Range. Within this distance there are several fishing drops that invariably yield enough for a day's catch within a few hours. In Placencia they travel northeast to South Water Caye, swing east to Gladden Spit, and proceed further southeast to Ranguana. In Dangriga they go north to Southern Long Caye and swing south to Tobacco and South Water Cayes. In Belize City they go in an easterly direction to the Turneffe Islands.

The use of these localized ranges has arisen more from familiarity and elimination due to overfishing, and not from a sense of proprietary rights. There is no sense of exclusive territoriality among fishers even against those coming across the border from Honduras and Guatemala. Indeed, during the spawning season traditionally men from different communities congregate at the same sites (see Craig 1966). They murmur among themselves and complain about the aggressiveness of their colleagues from other communities. The potential for conflictive flare-ups exist more between fishers and advocates for marine tourism. We will elaborate on this further below.

The above description introduces the extensive geographical knowledge of the coast by fisherfolk. It is knowledge handed down from one generation to the next showing centuries of co-existence between mankind and marine ecosystems. Even as COMPACT narrowly focuses on the Reef, and more particularly on World Heritage Sites, the users see them as fitting within the larger scheme of their own natural resources. The details of this scheme still need to be worked out but the following are some elements. The fishers see a hierarchy in the size and function of rock outcrops, ending with the Barrier Reef. They openly admit that they know and value these features for they have been the source of their livelihood for generations. Similarly, the cayes and coastline have their surrounding ecosystems with uses at different parts of the annual cycle. Such elaborate knowledge together with its related value system needs much analysis beyond the scope of this assessment.

2 A.4 Long Distances for Livelihood

While the above discussion has featured relatively short distances between the coast and the Reef, there is need to spotlight the use over long distances. Within this category fit the Sarteneja fishers, who not only travel the longest distances along the entire coast of the country, but also work the windward side of the Reef for lobster. The over two hundred fishers from the village work in groups – some at the Lighthouse Reef, others at Glovers Reef, Colson Point, and Hunting Caye. Furthermore, within the Lighthouse Reef they identified groups working the southern part of Half Moon Caye, Middle Reef, and Northern Two Cayes. One respondent from Sarteneja estimated that his co-villagers had over one thousand lobster traps in one area, Colson Point.

The other category of users over long distances are tour guides, tour operators, crew working aboard tourist boats, and diving instructors. Here we refer to specific target destinations that include the Blue Hole Natural Monument for divers and for sports fishers the Turneffe Islands and Glovers Reef, among others. There is another and quickly growing destination. It is whale shark watching in the area of the Silk Cayes near Placencia. The pattern of increasing attractions and sites for tourism coincides with our earlier observation on the diversification it offers as sources of livelihood for more persons in contrast to fishing, as it is regularly done. Another potential that is growing is game fishing taking place beyond the Reef all along the country.

While up to twenty years ago it was possible to say that most traffic was confined to short distances to coastal communities. It is increasingly no longer the case. Fishers are going longer distances. Tour operators are doing likewise. The extensive traffic across the Barrier Reef and in close contact with the atolls certainly increases the risk of damage to the Reef and smaller reef systems.

2. B Awareness of the Reef

In this segment of the questionnaire and the following we focused on the Reef – what respondents know about it and its threats.

The answers showed that respondents' knowledge was mixed – much user familiarity but minimal awareness in basic technical information. Almost all were familiar with the Reef and have visited or worked near it. Many knew the Reef's constituent parts, their fragility, and the sea depth before reaching it. However, very few knew little about the Reef geomorphology – its age and its significance in the formation of Belizean land and waters. Given the importance of the Reef and the wealth of information about it studied by visiting enthusiasts, Belizeans need to be trained far more about its intricacies. It is a point that reaches beyond coastal communities to the body of information that all Belizeans should possess in their public education system about this vital natural resource.

The lack of technical skills certainly masks the passion that respondents had toward the Reef, especially parts that are nearby. There was strong possessiveness in

Placencia toward Laughing Bird, Gladden Spit, and the Silk Cayes. In Punta Negra and Punta Gorda it was toward the smaller reef systems in the Port Honduras Marine Reserve and the Sapodilla Cayes Marine Reserve. The same goes for parts near all the communities, except Sarteneja. The closest part of the Reef to them is Bacalar Chico. However, the villagers had not been integrated into its management plans. On the other hand, they pass by there frequently on the way to their fishing sites.

We collected bits of anecdotal information that elaborates on practices related to the Reef. Sarteneja fishers use the Reef to catch lobster. In doing so there is a specialization based on age. Older men dive nearer the surface, while younger men with better stamina go deeper.

In concluding this discussion on knowledge of the Reef, I draw attention to the following. The first is the depth of emotional passion respondents have toward the Reef. The second is the folk knowledge that guides their daily behaviour toward its welfare. The third is scientific information on the impact of human activity both within macro and micro-reef systems. All of these topics need further scrutiny that could be included within the scope of COMPACT or another source committed to the applied study of the Reef ecosystem.

2. C Threats

The section on threats to the Reef listed several known threats. It asked respondents to say whether he/she agreed that it was a threat and to identify who were the perpetrators. Finally, it asked to list the three threats that were most pressing. For more information on the results see Section 2C in Appendix 4.

Respondents added the following to the list – waste disposal, chemical pollution, unexplained coral bleaching, hurricane damage, and global warming.

There was some candour in admitting that Belizeans, including the respondents themselves, were among the perpetrators of the damage. It is no doubt a function of the public information on do's and don'ts that the public sector and NGO's – including those coordinating the COMPACT – have been publicizing through the mass media. But the question remained how much damage the respondents are actually causing consciously or not. It straddles the area between technical expertise vs. folkloric information circulating within the coastal communities. For example, there is the belief in Placencia that touching the reef parts to pick up a lobster or other prey causes minimal damage, if any. On the other hand, they singled out sunscreen skin lotion as certainly causing damage. As in the case of the previous discussion on folk knowledge of marine and coastal geography, the need to deepen the dialogue between "scientists" and the "ordinary person" again comes into focus within the need to find complementarity between the two systems on the topic of threats and their mitigation.

In the lack of such complementarity, there was a feeling that blame was being unfairly hurled on some fishers. In fact, the Sarteneja men were quite defensive in responding to this section of the questionnaire. They alleged that more than other fishers

they were being unfairly accused. Again, this highlights the need for more accurate assessment of human impact on reef systems, using a mix of scientific skills and traditional knowledge. Such assessment seems so basic; however it demands a level of detail that is beyond this study. Without it the COMPACT project may be incomplete, if the welfare of the Reef is the ultimate objective.

There was strong correlation between communities and types of threats. Dredging was identified in San Pedro and Belize City, two communities where it is being used for the expansion of urban and resort areas. On the other hand, gillnets were mentioned more in southern communities.

Similarly there was correlation in the timing of mitigation measures to threats. Respondents in San Pedro said that overfishing had long been a threat to the extent that some species were hardly seen anymore. Punta Gorda respondents also identified overfishing as a threat but they were able to show that newly introduced zoning in the Port Honduras Marine Reserve was already resulting in the return of species that had become scarce. In short, the introduction of mitigation measures in Punta Gorda could stem the extent of denuding already experienced in places like San Pedro. Documenting such conspicuous demonstration effect in a before-and-after mode could be a worthwhile project for COMPACT.

There was some confusion on the application of government regulations affecting the perception of threats. Government gives licenses to harvest black coral used for the handicraft jewelry industry. Some respondents said that because these are government licenses, then the harvesting is not a threat. Obviously citizens need to be brought into the picture on how the government determines licenses for black coral, among other resources.

Anchoring came as a threat in all communities. The solution came up several times as the need for moorings especially in all tourist destinations.

I mention a threat that a respondent brought up. She described it as a threat not so much to the Reef but to humanity itself. It was the steady decline of fish and the higher cost for them when available. She elaborated on the nutritional benefits that citizens continue to suffer because of this. The point she was alluding to was that a healthy fish population is a prerequisite to the welfare of the Reef. This in turn refers to biodiversity, whose promotion is part of the COMPACT mandate. Many respondents included fish breeding as a project to be considered for COMPACT.

2. D Marine Protected Areas (MPA's)

The five questions under this segment were open-ended. They elicited the respondent's awareness of MPA's generally and specifically those near the communities. Finally, it asked whether respondents saw MPA's as contributing to the welfare of the Reef. The rationale for the question was twofold – to discern public reaction to controls on social behaviour that is already being institutionalized at MPA's. The other was to see if

such controls could have impact on encouraging biodiversity and ultimately the welfare of the Reef. The answer to both assumptions were positive.

However, we became aware that the topic of MPA was highly controversial not in primarily tourist destinations like San Pedro but in communities where fishing brought in a substantial part of the household income. Here Sarteneja is the prototypical example. The sentiment was best put forward by a respondent, "For whom are we setting aside MPA's? For the small fisher like me or the big time promoter with his tourists?" On further elaboration a primary criticism was that fishers were not consulted before MPA's were declared. The second was that they were the victims of discriminatory practices in some MPA's. The Sarteneja respondents singled out Glovers Reef as an example how not to establish and monitor an MPA. Their recurrent complaint was the rampant discrimination displayed by the rangers there against them.

Earlier we saw that generally fishers do not have too great a difficulty in sharing waters with other fishers. It certainly is not the case in sharing with non-fishers, who they perceive to be displacing them. MPA rangers, tourism promoters, conservation NGO's all fit into the same bag of enemies. The problem is serious enough to warrant special attention under COMPACT funding. A case study built around Glovers Reef would be appropriate to come to the depths of the problem. The topics could include the nature of the disagreement between the fishers and those responsible for the marine resave; the mechanisms for dialogue both with the MPA structure and otherwise; and specific milestones to be achieved through working together.

3. Social Values

The reason for including this section was to gauge where fishing and tourism fit within the social value system in the communities - in other words, which livelihood is more prestigious and generates greater community adulation. There were two questions under this section. One asked about the level of social acceptability for the following occupations – dropline fishing, tour guiding, running water taxi, catching lobster, diving for conch, selling fish, and other. The other question asked which of the occupations the respondent would recommend to his son.

It did not take us too long to realize that ranking by prestige was not an important factor; rather it was ranking by the amount of cash one earns relative to the amount of work expended within a given occupation. Respondents were aware of the relatively high cash value that both fishing and tourism could fetch. Of course, tourism, even though it does not yet exist within a given community, was perceived as bringing more cash than fishing. This was the case in Sarteneja to a large extent because it was seen as taking less work for the amount of cash it could generate. In other communities where tourism has virtually taken over from fishing like San Pedro and Placencia – and increasingly so in Punta Gorda, Punta Negra, and Dangriga – the comparative advantage is plain to be seen.

In Punta Gorda, selling fish received the highest level of social value followed by the others, all of which received almost the same level. In Placencia it was tour guiding followed by lobster and conch.

In Sarteneja both lobster and conch got the highest score followed by selling fish; and tour guiding, which is non-existent, came a distant last. If the Sarteneja respondents were reacting to their current conditions, they were quite specific on what they would recommend to their son as preferred livelihood. They did not see future in fishing. They argued that fishing is already overtaxed by the increasing numbers of fishers working within the increasingly limited space being made available to them from the MPA's. Tour guiding, therefore, became an attractive alternative, although they were not too certain what it would entail. They added that they had gotten away from farming because it was too much work for the returns; tourism they thought would give them correspondingly less work compared to fishing.

The expectation of respondents for their offsprings in the other communities echoes those of Sarteneja. Tour guiding and running water taxi ranked the highest..

The indications for COMPACT are that tourism is certainly a preferred way of livelihood in almost all communities. Better said, it is perceived as an alternative occupation that makes more cash for the amount of work injected. The challenge to make sure that fishing does not disappear will have to be pitched within the argument of re-generating biodiversity and meeting dietary needs of the Belizean public, a large part of which has a tradition of eating fish.

4. Cultural Attitudes

Our rationale for including this section was to find out the extent to which marine livelihood is embedded in the cognition of community members. We asked what immediately came to the respondents' mind on hearing the term "maritime resource"; what fears they had associated with the sea; and folklore that they might have heard associated with the sea. The patterns for each community were interesting.

In response to what immediately come to mind in Punta Gorda and Dangriga there was a split between concepts related to economic value and those related to aesthetics, such as natural beauty and recreation. The fears mostly focused on bodily harm caused by fish, notably sharks.

In Placencia and San Pedro concepts related to controlling the maritime resource were the ones that immediately came to mind. In San Pedro especially the greatest fear was not bodily harm but losing the natural resources that attract visitors and keep the economy going. As a respondent hotelier said, "What would I do if the coral reefs disappear!"

In Sarteneja concepts related to acquiring livelihood were most triggered by the term "maritime resource". As in San Pedro the loss of natural resource was the greatest

fear in Sarteneja; but more specifically the loss of opportunities to fish. Actually, it was the scarcity of fish because of the proliferation of reserves. The impression is that Sarteneja respondents find themselves most at risk of losing their fishing livelihood more than their counterparts in the other communities.

The indications for COMPACT are that a search for alternative forms of livelihood will be a major prerogative. In Placencia and San Pedro it will be associated with controlling and protecting resources that they are already exploiting. In Punta Gorda, Dangriga, and other communities it will be to exploit possibilities for both fishing and tourism.

On the topic of folklore, belief systems, and proverbs in all seven communities there were only few folklore retentions. Interestingly versions of the Jackie Lantern legend were repeated in all communities, despite differences in ethnicity. It underlines the cultural crossover that marine folklore has undergone in coastal communities. The scarcity of folklore was an indication of the widespread slippage in community cultural memory of marine traditions. Insofar as they are necessary as backdrop for human behaviour, it may be necessary for COMPACT to include an income generation component to retrieve and enliven them within artistic expression for the welfare of the community as well as for tourism.

There were two more questions that we asked on cultural traditions. One was whether respondents perceived a greater reliance on marine resources at this time than twenty years ago. The answer was a resounding yes. The reasons given in Placencia, San Pedro, and Sarteneja underline socioeconomic values that have already been indicated in the previous discussion. Placencia and San Pedro respondents argued that there was now greater reliance on tourism but not fishing. In Sarteneja it was that they do not have any alternative to meet the increasing cost of daily life.

A final question tried to elicit the extent to which the respondents were aware of their community as being distinctive in its use of marine resources relative to neigbouring communities. Generally, the responses were anecdotal and needing more ethnographic follow up. The response from Sarteneja fishers is worth noting. They mentioned that more than their neighbours they used the longest distance in the sea for their livelihood.

6. Recommendations

This part of the questionnaire said, "A primary objective of the COMPACT project is to fund projects that will lessen threats to the Reef. Could you briefly describe three such projects in which you could be involved?"

Section 6 in Appendix 4 gives a listing of recommendations. The patterns are as follows. There were three main headings under which recommendations fall – alternative sources of income, law enforcement, and education. Under alternative sources of income there were recommendations for activities taking place in the sea,

such as growing seaweed and watching manatees. There were more recommendations for activities taking place away from the sea under the expectation of minimizing threats away from the Reef. For wetlands surrounding the coast suggestions were to breed lobster, shrimp, fish, and turtle. There were also several for land-based activities, such as exploring Maya archeological sites, birding, and other wildlife.

Law enforcement came as a need to put some teeth into many of the laws that are already on the books protecting marine resources. The suggestions were for more rangers and equipment to undertake patrols.

Education was a popular topic. Many suggestions aimed to generally alert the citizenry about the value of marine resources with special reference to the Reef. It should be done by integrating it into the school curriculum from primary to post secondary . school. In addition, there should be specialized skills training in tour guiding, public relations, diving instructions, etc. Some of the training could be done informally by acquiring aquariums for demonstration to the public or by staging visits to our world heritage marine sites, which are unknown by most Belizeans.

The importance of subregional contexts was brought up in both Punta Gorda and Sarteneja. The aim was to integrate not only the immediate coastal area but also the hinterland as tourist destinations. The result would be to provide a highly diversified product, while simultaneously taking overload from the Reef.

Response from the Focus Groups

Punta Negra and Punta Gorda

In Punta Gorda there was an effort to interpret the scope of COMPACT very widely given the prevailing sub regional scope toward tourism in Toledo. Currently, there is more tourism taking place in the hinterland villages of the Maya than along the coast. There is considerable tourism taking place at the Sapodilla Cayes but it is seasonal and under the control of not Belizean but Guatemalan tour operators. Participants saw COMPACT as an unusual opportunity to bring the Sapodilla Cayes Marine Reserve under more Belizean control as well as to integrate their district wide diversified product into the growing tourism industry. Examples included the following:

- Building facilities at Cattle Landing as part of a comprehensive tour package that would include the Sapodilla Cayes. The rationale is to shorten their stay at the Cayes by providing additional land attractions.
- To have the Punta Negra Village Council take more active role in the management of the Payne's Creek National Park, again as part of a larger plan to diversify the tourism attractions in the sub region. Payne's Creek is well known as an excellent fishing area as well as being good for bird, manatee, and howler monkey watching, among other attractions.
- Suggestion that funds be made available to publicize the integrated land-sea biodiversity continuum in the Toledo District through a newsletter and other publicity.

- To fund trips to take children and their parents to visit the Sapodilla Cayes Marine Reserve, as currently it is largely unknown and unappreciated.
- To fund a 'before and after exercise'. The focus would be to increase the publicity on the amount of fish now available in the no-take zone of the Port Honduras Marine Reserve after the MPA regime came into effect. Earlier the fish had become scarce after decades of gillnet fishing. There was another kind of 'before after' exercise. It entails using the smaller reef systems in the Port Honduras Marine Reserve to learn about the Reef, including appropriate behaviour, before venturing to the main Barrier Reef.

There was concern that COMPACT fund projects that provide alternative sources of income to fishers displaced by the MPA's at Port Honduras and the Sapodilla Range. There was also question whether a planning grant would be made available to assist potential project applicants for COMPACT.

Placencia

In Placencia the primary concern was twofold – to make sure that fishing continues as a viable income earner and that tourism opportunities increase. To do both the villagers are aware that overfishing has to stop and that the services they provide to tourists have to be improved. While overfishing may not be a problem that they could curb, given the numbers of non-Placencia fishers in their waters, they feel that they can control the tourism product.

There was much concern on the state of the fishing stock as well as the supply of lobster and conch. Some thought that recent scientific evidence showed that the stocks were healthy. Others argued that their intake was decreasing. It would seem that a project combining technical expertise with folk knowledge on this topic would be appropriate. COMPACT may want to review this possibility.

There was much that could be done to widen and improve the level of service being extended to tourists. Firstly, it was plain that the activities in demand by tourists are increasing but that the providers of these services were scarce or not properly trained. One area singled out was the various levels of proficiency in diving. The facilities for this kind of training were minimal and certainly inadequate to meet the current demand. Another area singled out was the public relations currently exercised by the tour guides. It ranged from poor attitude to not being able to explain themselves adequately to their clients. Again, there was strong recommendation for projects focusing on training.

Another issue related to tourism was the monitoring of tourists, especially snorkelers and divers. They could damage the reef if they are not enough and properly trained guides.

On the topic of MPA's, the consensus was that in principle they were good but that they suffered from proper monitoring. Projects should focus on this.

The following are other recommendations:

- Putting together a large aquarium which could serve as a museum for the villagers and tourists
- Training in fly fishing
- Farming seaweed
- Moorings at dive sites
- Women to open catering services to supply boats that take out tourists
- Traps for fishermen
- Fish meal for fertilizer

Sarteneja

In Sarteneja participants were aware that more than any other community in Belize they travel the entire length of the country to dive for conch and lobster. They are intimately familiar with the Reef and have vital interest in its protection as primary source of their livelihood. They felt, however, that the rest of the country, especially the conservationists do not understand them and keep blaming them unfairly for unsustainable practices on the Reef and the larger marine area.

Furthermore, they would prefer to have income generation projects closer to home, as they are getting fewer returns for the extended efforts they are giving to fishing. They feel that the subregion surrounding the village has much potential for diversified tourism that include land attractions, such as Maya sites, butterfly breeding, wetlands, wildlife as well as marine attractions that include manatee watching and sailing in the Bay. The following were specific recommendations:

- Marine museum
- Planning a fiesta that will lure visitors to Sarteneja not only during Easter time
- Manatee sanctuary
- Birding
- Revive the butterfly production for export
- Diversification in agriculture for papaya, onion, berries, etc.
- Promotion of sailing.

San Pedro

Dredging: increase public awareness and economic education

Overfishing: offer alternative sources of income to prevent overfishing

Tour guide training: providing local level training to avoid having to come to Belize City.

Tourism: promoting community civic behaviour that encourages and does not discourage tourism.

Environmental education: to be done on a sustained basis from primary to postsecondary school.

Dangriga

Training of tour guides and fishers

Providing markers at marine resorts and mooring sites

Protection for wetlands and inland lagoons

Monitoring runoff from citrus and other industries

Belize City

Tourism product development – Belize Tourism Board and Belize Audubon Society to access COMPACT funding for tourism product development

Signs – erecting signs where visitors go about protecting the Reef

Fly fishing – more research and education

Law enforcement – training fishers in law enforcement

Tour guide training – to select candidates to upgrade the stature of the tour guide for marine resorts.

One of the questions we discussed in the focus groups was on the existence of organizations that could assist community groups in their project implementation. In Placencia there was no hesitation to mention the Friends of Laughing Bird Caye group, which has co-management responsibility for the marine reserve with the same name. In Punta Gorda it was TIDE, which has responsibility for the Port Honduras Marine Reserve and TASTE for the Sapodilla Cayes Marine Reserve. The other communities did not have organizations already formed and dedicated to working with specific marine protected areas. Those mentioned included Green Reef at San Pedro and in other places Belize Audubon Society and BEST. However, both sets of intermediary organizations – those dedicated to specific sites and those not – would not have the funding and or manpower on their own to proactively offer much needed assistance to community groups. In the end, identifying partners for community projects will be a challenge for COMPACT equally as difficult as identifying projects within the communities themselves.

It is important to note that one should not overlook the presence of strategic persons in the communities, who have already thought through some development

projects and have expressed willingness to help. One respondent in Sarteneja identified groups and project proposals on which he and others have worked. For example, he mentioned the Amigos de la Bahia, which has put together a co-management plan for a manatee sanctuary in the Corozal Bay dated November, 1999. A copy is attached as Appendix 5. Other communities no doubt have similar persons, who could be most valuable resources.

COMMUNITY MANAGEMENT OF PROTECTED AREAS CONSERVATION PROJECT (COMPACT)

Final Draft Report

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Appendix 1

Participants in Questionnaire and Focus Groups

Community	Questionnaire Respondent	Focus Group Participant
Punta Negra and Punta Gorda	Carlos Galvez, Carlos Castellanos, Pablo Bouchub, Dwight Woodye, Ana Ramirez, Govel Morgan Jr., Dennis Garbutt.	Jacklyn Young, Frank Foster, Wilfred Requena, Jack Nightingale, Agnes Norales, Martha Requena, Alfonso Archer, Glenda Archer, Maria De Leon
Placencia	Sidney Lopez, Julie Berry, Diana Eiley, Lydia Villanueva, Godfrey, Carlton Young	Wendy Wesby, Lisa Carre, David Vernon, Leopold Leslie, George Wesby, Edlin Leslie, Kirk Godfrey
Sarteneja	Evaristo Verde, Fernando Alamilla, Jason Perez, Armaldo Cobb, Mr. Noel Munoz, Mr. Cesar Munoz	Conchita Rodriguez, Elwin Rodriguez, Servando Samos, Maria Verde, Alfredo Cantun, Loila Trejo, Adalberto Cruz, Alan Cruz, Lizanne Perez, Diogenes Perez
Dangriga	Mr. Cassian Nunez, Richard Cherrington, Evelyn Thomas, Alexander Sabal, Nathaniel Miguel, John Jackson, Augustine Flores	Marvin Deras, Victor Williams, Thomas Sabal, Thomas Bermudez, Shanna Jackson, Barbara Rosado, Denzil Castillo, Kenrick Wellington
San Pedro	Nesto Gomez, Eileen Jamison, Rosendo Rubio, Lisa Guerrero, Einer Gomez,	Gianna Gomez, Abel Guerrero, Daniel Guerrero, Melanie Paz, Mel Spain, Miguel Alamilla, Susanna Eiley, Jose Gonzalez, Mito Paz, Jill Hepp
Belize City	Alan Burns, Ramon Cervantes, Sergio Hoare, Bert Murillo	Mustafa Toure, Henry Aterly, Sergio Hoare, Valdemar Andrade, Cassian Aguet, Eden Garcia, Allan Burns, Andrew Godoy, Mr. Marin

Appendix 2

Logic of The Questionnaire

Headings	Content	Rationale
1. Personal 7. Socio-demography	Glimpse of the R's as comm. Members in terms of age, source of income, hhd size, ethnicity, time period in comm etc	The Respondents as a form of community representation
2. The Environment		
A. Geography	Methods of livelihood from the sea Areas exploited relative to the Reef Distance of exploitation from the comm.	The sea as a natural resource
B. Awareness of Reef	Level of R's knowledge of basic features of Reef; its distance from the comm; and what they do close to the Reef	The Reef area as focus of different forms of exploitation
C. Threats to the Reef	Awareness of common threats, e.g. overfishing; and ranking them	The R's knowledge of threats and their perpetrators
D. MPA	Awareness of MPA's and how they see them as contributing to the Reef's welfare	MPA's and their contribution to Reef's welfare
3. Social Values	Level of social acceptance of various kinds of marine livelihood	The degree of social value extended to various forms of exploitation
4. Cultural Attitudes	Connotations underlying marine resources: fears normally associated; cultural memory in folklore; comm specific use of marine resources	Extent of embeddedness within cognition – useful to gauge level of preparedness to change behaviour
5. Economic	Impressions on more common sources of livelihood esp. from the	To reinforce the place of the sea in the socioeconomy following up from 2.A. Spotlighting

	sea. What could be done to generate more income to women and youth	women and youth as beneficiaries
6. Recommendations	R's suggestions on possible projects for COMPACT	The main aim of the community assessment.

Appendix 3

COMPACT

QUESTIONNAIRE SURVEY INSTRUMENT

Self-Introduction – *Explain briefly the Community Management of Protected Areas Conservation Project (COMPACT), especially where the community fits into the process. The contribution of the Respondent will help in planning the Project. Explain that the individual answers will be held confidentially; and that our interest is in the larger picture forthcoming from all the results.*

1. Personal:

Name:

Age:

Address:

2. Environment

A. Geography

1. In many communities many people earn their living from the sea. What kinds of livelihood from the sea do residents of this community most use:

	Yes	No
Fishing	( )	( )
Water taxi operator	( )	( )
Tour guide	( )	( )
Tour operator	( )	( )
Taking tourists fishing	( )	( )

Other….. Kindly explain

_____

2. Using the Reef as point of reference, what part of the sea do residents of this community most use for their living?

Close to the beach, about two miles maximum distance	( )	( )
A distance more than two miles but not around the Reef	( )	( )
Immediately near the Reef	( )	( )
Beyond the Reef in the open seas	( )	( )

Other….. Kindly explain

3. What local name (s) do the community residents apply to it (them):

_____

(*Here probe to see if there are local names within the vernacular or otherwise that may be used*)

4. In some communities persons travel long distances (ten miles and more) along the coast for their livelihood. Is that the case for this community? Yes____ No___

If yes, in what directions do they go North___ South___Other____

Near what cayes or other landmarks would they go?_____

_____

B. Awareness of the Reef

I will ask you questions to test your awareness of the Reef. Please answer each one as clearly as : *The exercise is not meant to feel the Respondent uncomfortable. If the answer is 'don't know', indicate it* as *DK*

- How old is the Reef?
- What are the parts that make up the Reef?
- How fragile are these parts?
- How deep does the sea get before reaching the Reef?
- How deep is it on the side away from the Reef?
- What are the main functions that the Reef provides to other marine life?
- How far is the Reef away from your community?
- Have you been close to the Reef?
- If yes, what were you doing there?
- What are the distinctive features of the Reef that you see from a distance?

C. <u>Threats and their Mitigation</u>

1. The Reef is an important part of the sea for both humankind and marine life, which of the following would you say is threatening the welfare of the Reef? Please indicate who the perpetrators are.

Overfishing on the Reef No_____Yes_____ If yes, by whom?

Tourism activities (snorkeling, diving, etc) on the Reef No_____Yes_____, If yes, by whom?

Anchoring on the Reef No_____Yes_____If yes, by whom?

Dredging on the Reef No_____Yes_____If yes, by whom?

Removal of coral for jewelry No_____Yes_____If yes, by whom?

Boat damage to Reef from running aground No_____Yes_____If yes, by whom?

Setting gill nets on the Reef No_____Yes_____If yes, by whom?

Other sources and their perpetrators

2. Put three of the above in order from highest to lowest threat:

_____

_____

_____

D. Marine Protected Areas *(You may use other commonly used terms like 'marine parks', or 'nature reserves for the sea')*

1. Do you know what marine protected areas are? Yes_____ No_____

2. If yes, can you briefly describe what their function is?

---

3. If yes, can you mention one or two that are closest to your community?

---

4. If yes, do you see marine protected areas as contributing to the welfare of the Reef? Can you briefly elaborate?

---

3. Social Values

1. How acceptable are the following ways of earning a living from the sea within your community?

	Very acceptable				Not acceptable
Dropline fishing……	5……	4……	3……	2……	1…….
Tour guiding	5	4	3	2	1
Running water taxi	5	4	3	2	1
Catching lobster	5	4	3	2	1
Diving for conch	5	4	3	2	1
Selling fish	5	4	3	2	1
Other (Kindly identify…….)	5	4	3	2	1

2. Which of the above occupations would you recommend to your son? Could you list three starting with the highest and going to your lowest preference?

---

4. Cultural Attitudes

1. Whenever you hear the term “maritime resource” what three things immediately come to your mind?

---

2. Mention three fears that come to your mind that are associated with the sea

---

---

3. Do you remember any stories, beliefs, proverbs, etc that you might have heard about the sea, fish, and related features?

No__Yes___Kindly elaborate

(If the feature is too long, make arrangements to have it audio-recorded at another date.)

4. *Is there more or less reliance on the sea compared to the situation about 20 years ago? Kindly explain*

*(*It is necessary to be open with this question as it might be both yes and no. The concept of the usefulness of the sea itself might have changed. It might have been used more for transportation earlier, for example, or source of livelihood for fishing, etc.. But the input from the Respondent is important.*)*

5. Are there some resources – fish, parts of the sea, etc – that your community uses more than other communities? Yes___ No____ If yes, kindly explain

6. Are you aware of different preferences forthcoming from nearby communities? Yes____ No____ If yes, kindly explain

(The point here is to elicit from the Respondent any degree of specialization by his community or ethnic group with respect to maritime resources This is a question that some people may find difficult but probe along the differences for types of fish,

seasonality for some fish, not using the sea as much as others, etc.. In probing mention neighbouring communities, especially if they are of different ethnicity.)

5. Economic

1. How do most people in this community earn their living? Can you identify three ways?

2. Among these cash earning activities can you specify those dealing with the sea and list them in terms of cash income?

3. What could be done to generate more income through the use of the sea:

4. How do you see women getting more cash income through activities related to the sea?

(*In probing make sure to explain that some economic opportunities are direct, for example, the proceeds from fishing; while others are indirect, for example, running a guest house or booking tours, etc.. This goes for the next question. It is important that answers be given to these questions.)*

5. How do you see youth getting more cash income through activities related to the sea?

6. Recommendations

1. A primary objective of the COMPACT project is to fund projects that will lessen threats on the Reef. Could you briefly describe three such projects in which you could be involved?

7. Socio-demographic data

1. How long have you lived in this community?

2. What is your main source of income?

3. How many persons are there in your household?

4. To what ethnic group do you belong?

Please thank the Respondent for his/her time and patience.

Appendix 4

Frequency of Variables in Study Communities

Variables	**Punta Gorda**	**Placencia**	Sarteneja
1. **Biographical Data**			
Gender	6 males 1 female	3 males 3 females	6 males
Age Range	4: 27-37, 2:37-43, 1: 19	Females: 40-46, males 50-67	5: 36-43, 1: 63
Income	3: tourism, 2: fisher, 1: broadcaster, 1: MPA Ranger	Females: tourism, males: fisher	All fishers, 2 part-time store keepers
Persons in household	4: 4, 1:1, 1:3, 1: 7	2: 2, 1:3, 1:4, 1:5	Av: 4 persons, range: 3-6
Time in Community	All most of their life	All, except 1 most of their life	All most of their life
Ethnicity	3-Creole, 2-Mestizo, 1-East Indian, 1-Garifuna	Creole	Creole
2. Environment, A.Geography			
1.Main Livelihood			
Fishing	Yes: 7, No: 0	Yes: 6, No: 0	Yes: 6, No:0
Water taxi operator	Yes: 7, No: 0	Yes: 4, No: 2	Yes: 0, No: 6
Tour guide	Yes: 7, No: 0	Yes: 4, No: 2	Yes: 3, No: 3
Tour operator	Yes: 5, No: 0	Yes: 7, No:2	Yes: 0, No:7
Taking tourists fishing	Yes: 5, No: 0	Yes: 6, No: 0	Yes: 0, No: 6
2. Part of sea most used			
2 miles from beach	Yes: 7, No: 0	Yes: 3, No:1	Yes: 3, No: 3
More than 2 miles	Yes: 4, No: 2	Yes: 4, No:0	Yes: 4, No: 2
Immediately near Reef	Yes: 7, No: 0	Yes: 4, No:0	Yes: 4, No.2
Beyond the Reef	Yes: 3, No: 3	Yes: 4, No:0	Yes:4, No: 0
4. Long distance for livelihood	Yes: 5, No: 2	Yes: 5, No:0	Yes: 6, No: 0
Variables	**Punta Gorda**	**Placencia**	Sarteneja
2.Environment, B. Awareness of Reef			
Age of Reef	D.K:7	D.K:5. K:1	D.K:5, K:0
Constituent parts	D.K:5, K:2	D.K:0, K:6	D.K:0, K:5
Fragility of parts	D.K:3, K:2	D.K:0, K:6	D.K:0, K:5
Sea depth before Reef	D.K:4, K:3	D.K:0, K:5	D.K:0, K:5
Sea depth away from Reef	D.K:5, K:2	D.K:1, K:5	D.K:0, K:4

Functions to marine life	D.K:1, K:6	D.K:0, K:6	D.K:0, K:4
Distance from community	D.K: 3, K:4	D.K:1, K:5	D.K:1, K:1
Have been close to Reef	Yes: 6, No: 1	Yes: 6, No:0	Yes: 4, K:0
If yes, doing what	Diving, fishing, tour guide	Fishing, diving, tour guide	Fishing and diving
Distinctive features close to Reef	D.K:3, K:4	D.K:0, K:6	D.K:O, K:5
2.Environment, C. Threats to Reef			
Overfishing	No: 2, Yes: 5	No: 0, Yes: 6	No: 0, Yes: 4
By whom:	Locals and aliens	Younger fisher, locals and aliens	Everybody
Tourism (snorkeling, diving, etc)	No: 5, Yes: 2	Yes: 3	Yes: 4
By whom:		Too few tour guides	
Anchoring on the Reef	No: 3, Yes: 4	No: 2, Yes: 6	No: 2, Yes: 3
By whom:	Tourist boats	Everyone	Tourist boats
Dredging on the Reef	No: 4, Yes: 3	No: 2, Yes: 3	No: 2, Yes: 3
Removing coral for jewelry	No: 1, Yes: 5	No: 5, Yes: 0	No: 5, Yes: 1
Boat damage running aground	No: 2, Yes: 5	No: 5, Yes: 0	No: 3, Yes: 3
Variables	**Punta Gorda**	**Placencia**	**Sarteneja**
By whom	Tourist boats		
Setting gill nets	No: 1, Yes: 5	No: 0, Yes: 4	No: 2, Yes: 5
By whom:	local and aliens	Everybody	Mostly fishers from South
Three of the above	Gillnets, coral removal, anchoring, and overfishing	Anchoring, gillnets, overfishing, and chemical pollution	
2.Environment, D. Marine Protected Areas			
Know what MPA's are	No: 0, Yes: 7	No: 0, Yes: 6	No: 0, Yes: 6
Describe function	Protection,	Same as in PG	Same as in PG

	regenerating stock, managing and controlling usage		
Name two	Most could name two	Same as in PG	Same as in PG
MPA's contributing to Reef welfare	Yes, more fish seen, people become educated, good for tourism	Need involvement of fishers, eg of Glovers Reef as the way how not to do MPA	Same as in Placencia
3. Social Values			
1.Acceptability of the following			
Dropline fishing	25 out of 35	25 out of 30	10 out of 15
Tour guiding	25 out of 35	30 out of 30	7 out of 15
Running water taxi	25 out of 35	25 out of 30	6 out of 15
Catching lobster	25 out of 35	26 out of 30	15 out of 15
Diving for conch	24 out of 35	26 out of 30	15 out of 15
Selling fish	26 out of 35	25 out of 30	8 out of 15
Variables	**Punta Gorda**	**Placencia**	**Sarteneja**
2. What recommend to son	Tour guiding, lobster, water taxi, dropline	Tour guiding by far and remotely fly fishing, diving, dropline	See comments
4. Cultural Attitudes			
1. Concepts associated with "maritime resource"	Fish, fishing, sea product – 3 Beauty, recreation, richness – 3 Finance, financial value – 2 Protection – 1 Non-material: spirituality - 1	Control – 4 Fishing, diving - 2 Overfishing – 2 Money – 1	Lobster, conch, livelihood – 9 Limitations: fishing too much work; too many fishers, limited space - 3
2. Fears associated with the sea	Fish causing bodily harm: 4 Nature: hurricane, etc: 4 Chemical pollution, restrictive laws, public education:1	Fishing causing harm – 5 Lack of PR by tour guides, engine failure in bad weather, others taking away fishing grounds,	Scare resource, too many reserves, natural disaster, fight for the welfare of fishers, security – pirates.

		diving difficulty	
4. More or less reliance on sea	Yes: more capability to access resources; diversification into tourism	Yes; now main source livelihood. Yes for tourism but not fishing	Yes: more people, more bills and no alternative; decline in farming
5. Economic			
1. Most people earn living	Most respondents not too clear; mention fishing, tourism, wage labour, farming	Tourism, fishing, wage labour	Fishing, no agriculture
2. Those dealing with sea	Fishing, water taxi, tourism	Fishing and tourism	
3. How to generate more income from the sea	Protect area for tourism and later usage; financial support: loan collateral	More protection; limit fishing to promote MPA's	Tourism, deep sea fishing, and mariculture
Variables	**Punta Gorda**	**Placencia**	**Sarteneja**
4. How to get more women involved	Fishing, tourism, craftwork, family working together	Fishing, tourism, especially diving	Women not to engage in economy beyond the household
5. How to get more youth involved	Teaching them about opportunities	Ditto	Too many fishers already; to get alternative careers
6. Recommendations for COMPACT	More rangers More equipment Fishing for export Bring tourists Traditional medicine from seaweed Training facility for swimming and diving Mariculture	Seaweed production Training in PR for tour guides Monitoring vs. poachers Increase lobster traps Preserves from fruits Patrolling	Vaguely on tourism: use early experience in butterfly breeding Develop Maya sites, among other land-based attractions Work with the Tourism Development Committee

Frequency of Variables in Study Communities (cont.)

Variables	Dangriga	San Pedro	Belize City
1. **Biographical Data**			
Gender	6 males 1 female	3 males 2 females	4 males
Age Range	3: 61-70, 3:37-45, 1: 19	1: 20, 3:26-35, 1:42	1: 25, 2: 56-65, 1: 37
Income	3: tourism/fisher, 1: fish monger, 1: town board, 1: hotelier, 1: civil society	1:editor, 4: tourism	1 NGO researcher, 1 cooperative officer, 2 tourism
Persons in household	2: 4, 1:7, 1:8, 1: 2, 1:6, 1:5	1: 2, 1:5, 2:4, 1:8	1: 2, 1:3, 2:4
Time in Community	All most of their life	All, except 1 most of their life	All most of their life
Ethnicity	2-Creole, 5-Garifuna	1Creole, 4-Mestizo	2-Mestizo, 2-Creole
2. Environment, A.Geography			
1.Main Livelihood			
Fishing	Yes: 7, No: 0	Yes: 5, No: 0	Yes: 4, No: 0
Water taxi operator	Yes: 5, No: 2	Yes: 5, No: 0	Yes: 4, No: 0
Tour guide	Yes: 7, No: 0	Yes: 5, No: 0	Yes: 4, No: 0
Tour operator	Yes: 6, No: 1	Yes: 5, No: 0	Yes: 4, No: 0
Taking tourists fishing	Yes: 6, No: 1	Yes: 5, No: 0	Yes: 4, No: 0
2. Part of sea most used			
2 miles from beach	Yes: 6, No: 1	Yes: 5, No: 0	Yes: 4, No: 0
More than 2 miles	Yes: 6, No: 1	Yes: 3, No: 2	Yes: 3, No: 1
Immediately near Reef	Yes: 5, No: 2	Yes: 5, No: 0	Yes: 4, No: 0
Beyond the Reef	Yes: 6, No: 1	Yes: 3, No: 2	Yes: 4, No: 0
4. Long distance for livelihood	Yes: 6, No: 1	Yes: 3, No: 2	Yes: 4, No: 0
Variables	**Dangriga**	**San Pedro**	**Belize City**
2.Environment, B. Awareness of Reef			
Age of Reef	D.K:3, K:4	D.K:2, K:3	D.K:2, K:2
Constituent parts	D.K:0, K:7	D.K:0, K:5	D.K:0, K:4

Fragility of parts	D.K:0, K:7	D.K:0, K:5	D.K:0, K:4
Sea depth before Reef	D.K:2, K:5	D.K:1, K:4	D.K:0, K:4
Sea depth away from Reef	D.K:2, K:5	D.K:1, K:4	D.K:0, K:4
Functions to marine life	D.K:0, K:7	D.K:0, K:5	D.K:0, K:4
Distance from community	D.K:1 , K:6	D.K:0, K:5	D.K:3, K:1
Have been close to Reef	Yes: 7, No: 0	Yes: 5, No:0	Yes: 4, K:0
If yes, doing what	Diving, fishing, tour guide, snorkeling	Fishing, diving, snorkeling, tour guide	Fishing , researching and diving
Distinctive features close to Reef	D.K:1, K:46	D.K:0, K:5	D.K:O, K:4
2.Environment, C. Threats to Reef			
Overfishing	No: 2, Yes: 5	No: 1, Yes: 4	No: 0, Yes: 4
By whom:	Locals and aliens	Same as in Dangriga	Same as in Dangriga
Tourism (snorkeling, diving, etc)	No: 5, Yes: 2	No: 1, Yes: 4	No:1, Yes: 3
By whom:	Untrained tour guides and improper tourist supervision	Same as in Dangriga	Same as in Dangriga
Anchoring on the Reef	No: 1, Yes: 6	No: 0, Yes: 5	No: 1, Yes: 3
By whom:	Fishers	Foreign boats	Tourist boats
Dredging on the Reef	No: 2, Yes: 5	No: 0, Yes: 5	No: 2, Yes: 2
Removing coral for jewelry	No: 2, Yes: 5	No: 3, Yes: 2	No: 2, Yes: 2
Boat damage running aground	No: 1, Yes: 6	No: 2, Yes: 3	No: 2, Yes: 2
Variables	**Dangriga**	**San Pedro**	**Belize City**
By whom	Tourist boats	Same as in Dangriga	Same as in Dangriga
Setting gill nets	No: 1, Yes: 6	No: 1, Yes: 4	No: 1, Yes: 3
By whom:	local and aliens		Mostly fishers
Three of the above	Gillnets, tourism, anchoring, and overfishing	Dredging, overfishing, tourism, anchoring	Dredging, overfishing, tourism
2.Environment, D. Marine Protected			

Areas			
Know what MPA's are	No: 1, Yes: 6	No: 0, Yes: 5	No: 0, Yes: 4
Describe function	Protection, regenerating stock, managing and controlling usage	Same as in Dangriga	Same as in Dangriga
Name two	Most could name two	Same as in PG	Same as in PG
MPA's contributing to Reef welfare	Yes, more fish seen, people become educated; though there has been the negative aspect of misuse by those in charge.	Yes, more fish seen, people become educated, good for tourism	Yes, more fish seen, people become educated
3. Social Values			
1.Acceptability of the following			
Dropline fishing	15 out of 35	0 out of 25	5 out of 20
Tour guiding	20 out of 35	20 out of 25	15out of 20
Running water taxi	20 out of 35	10 out of 25	20 out of 20
Catching lobster	20 out of 35	10 out of 25	10 out of 20
Diving for conch	15 out of 35	5 out of 25	0 out of 20
Selling fish	15 out of 35	10 out of 25	0 out of 20
Variables	**Dangriga**	**San Pedro**	**Belize City**
2. What recommend to son	Tour guiding, lobster, water taxi, dropline	Tour guiding by far and remotely lobster and conch catching	Tour guiding, lobster, water taxi, dropline and conch
4. Cultural Attitudes			
1. Concepts associated with "maritime resource"	Fish, fishing, sea product – 3 Beauty, recreation, richness – 3 Finance, financial value – 2 Protection – 1 Non-material: spirituality - 1	Control – 4 Fishing, diving - 2 Overfishing – 2 Money – 1	Lobster, conch, livelihood – 9 Limitations: fishing too much work; too many fishers, limited space - 3
2. Fears associated with the sea	Fish causing bodily harm: 3 Nature: hurricane,	Nature: hurricane:5, depletion of	Scare resource, natural disaster, pollution of water

	etc: 4	resources near the reef: 5	
4. More or less reliance on sea	Yes: more capability to access resources; diversification into tourism	Yes; now main source livelihood. Yes for tourism but not fishing	Yes: more people, more technology; decline in farming
5. Economic			
1. Most people earn living	Farming, fishing, construction and tour guiding	Largely from tourism and to a lesser degree from fishing	Commerce, and employment in public and private sectors
2. Those dealing with sea	Fishing, water taxi, tourism	Tour guiding, commercial fishing	Tour guiding, catching lobster, and commercial fishing
3. How to generate more income from the sea	More protection (patrols); education, training in services for tourism, financial support, more ads, more fishing	San Pedro has done it all!	Marketing tourism and better management of resources.
4. How to get more women involved	Training in similar activities that men have pioneered, using seafood to develop restaurants, cooperatives etc., try to change women's perception	Women are already involved in every aspect for tourism; perhaps training more tour guides.	Training in tourism ; esp. in tour and snorkeling guides, perception is that they would make better guides.
5. How to get more youth involved	Fishing, tourism, craftwork, family working together, promoting job opportunities	Educating them and promoting other opportunities, but for the most part has already incorporated them.	Training and educating in tourism and in scientific aspect
6. Recommendations for COMPACT			
	Education of all those impacting on the sea, deep sea fishing, use lagoon to raise	Education from primary level to tour guides, conch hatchery, turtle farming, sports	Education with the use of a museum to replicate, turtle hatchery, aquaculture

	lobster, shrimp farms, agriculture, maintaining small accommodation	fishing tournament, more rangers, mooring buoys	

APPENDIX 5

PROPOSED CO-MANAGEMENT PLAN

COROZAL BAY MANATEE SANCTUARY