



FIELD SEASON REPORT 2007: SOCIO-ECONOMIC AND GOVERNANCE OBJECTIVES OF THE CAYOS COCHINOS MARINE PROTECTED AREA (CCMPA) MANAGEMENT PLAN



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1. AIMS AND OBJECTIVES

1.1 Aim – To assess the effectiveness of the management plan for the Cayos Cochinos Marine Protected Area (CCMPA) using cognitive, socio-economic, and governance criteria.

1.2 Hypothesis – The management plan for the CCMPA, though generally beneficial in theory, has weaknesses in practice that need to be addressed.

1.3 Objectives

1. To identify levels of awareness of the management plan among the local communities.
2. To assess levels of satisfaction with the management plan and with the current management of the CCMPA
3. To estimate the impact of the management plan on employment and income for the local communities.
4. To consider the effects of the management plan on the social cohesion of the local communities.
5. To evaluate whether knowledge of factors affecting health of the marine resources has increased as a result of the management plan.
6. To investigate the suitability of existing governance and legal frameworks for successful implementation of the management plan.

2. EXECUTIVE SUMMARY

This report summarises the findings of the socio-economic and governance assessment of the management plan of the CCMPA. Household surveys, fishers' focus groups and key informant interviews were conducted between May and September 2007 in Garifuna communities inside and on the coastal boundary of the CCMPA. The results suggest that although the management plan is achieving its stated ecological and conservation objectives, it is having limited success in reaching its socio-economic objectives to mitigate the negative impact of resource use restrictions on the local communities.

3. INTRODUCTION

3.1 Practical Context

Recent studies have suggested that successful management of MPAs requires socio-economic and governance criteria alongside traditional ecological and conservation efforts. However, the majority of scientific research conducted specifically in and around the Cayos Cochinos has been focused on ecological assessments of the coral reefs and associated marine and terrestrial species (Guzman (ed), 1998; Harborne *et al*, 2001; Montgomery *et al*, 2007; Denning (ed), 2005; Almada-Villela *et al*, 2003). The most recent research published by the Global Coral Reef Monitoring Network (GCRMN) on the status of Caribbean coral reefs reported that live coral cover was relatively low (10-15%), and macroalgae coverage was up to 19% on reef flats throughout Honduras. The report also concluded that 34% of Honduran coral reefs are threatened by anthropogenic stresses, the most prevalent being over-fishing (30%), coastal developments (25%), sedimentation from agricultural practices (10%) and marine based activities (6%) (McField *et al*, 2008). The GCRMN report also points out that enforcement of regulations and resource management across Honduras is generally considered to be weak, and most of the twelve recognised marine protected areas are not legally declared or managed. Given the importance of the apparent effect of human behaviours in coastal regions, there has been little previous work focused on the socio-economic situation of the reefs in Honduras, or the governance issues within which the management operates both nationally and regionally as a member of the MBRS. The most recent regional study by McPherson (2006) focused on livelihood transitions and sustainable fishing communities in the Mesoamerican Reef Region. The report concluded that there are few job opportunities for fishers in the region, and these opportunities are not distributed evenly across the region. The main finding was that tourism related activities presented the greatest opportunity for a transition from traditional activities to alternative income generating activities.

Importantly, one of the main objectives in the management plan for the CCMPA (2004-2009) was designed to assess the potential for developing sustainable incomes for the local communities who benefit from living in or around the CCMPA. In order to make this assessment, a baseline monitoring programme of socio-economic performance indicators is needed to establish resource dependency in each community. Research conducted in association with Operation Wallacea since 2005 has primarily focusing on ecotourism and its impacts to communities within the MPA catchment area (Denning (ed),

2005; Brondo and Woods, 2006). In addition to the continuing ecotourism research, this project will provide information on these indicators to the managing agency to facilitate evidence-based decisions regarding restrictions and regulations for artisanal fishers in the CCMPA.

It is also necessary to evaluate the appropriateness of national and regional governance for fisheries management that impacts on the CCMPA. The CCMPA is part of the 1000 km long Mesoamerican Barrier Reef System (MBRS) region which incorporates Honduras, Belize, Guatemala and Mexico (Figure 1). The MBRS has been recognised as globally important for conservation of biodiversity, cultural and socio-economic values. However, the ecological integrity of the region is being threatened by anthropogenic and natural factors, including coastal development, tourism development, unsustainable fishing pressure and climate change (McField *et al*, 2008). In response to the natural disturbances, management efforts are concentrated on restoring and maintaining reef ecosystem resilience. In 2004, the first Mesoamerican Fishermen’s Congress was held in Mexico as a forum for discussion on fishing cooperatives, alternative economic activities for fishers, conservation and management of certain species (conch, lobster and snapper) and regulations for fisheries. The resultant agreement from the congress was designed to facilitate the management of the participating organisations and their ability to implement fisheries policy. This was designed to harmonise some regional regulations for the use of coastal resources, i.e., restrictions on the size and material of lobster pots, which is now effective in all MPAs in the region. The congress was the first opportunity for stakeholders and managing bodies to exchange in open dialogue about the management of fisheries (MBRS, 2004). Similarly, an Action Plan was devised in 2005 where all member countries governments and associated managing agencies agreed to ‘consolidate sustainable development opportunities in the region in the areas of tourism, fisheries, management of marine protected areas, and research and education, through the rational use and conservation of barrier reef resources’ (MBRS, 2006). Therefore, this research project will provide information based on governance indicators to assess the effectiveness of the management plan in achieving these agreed aims.

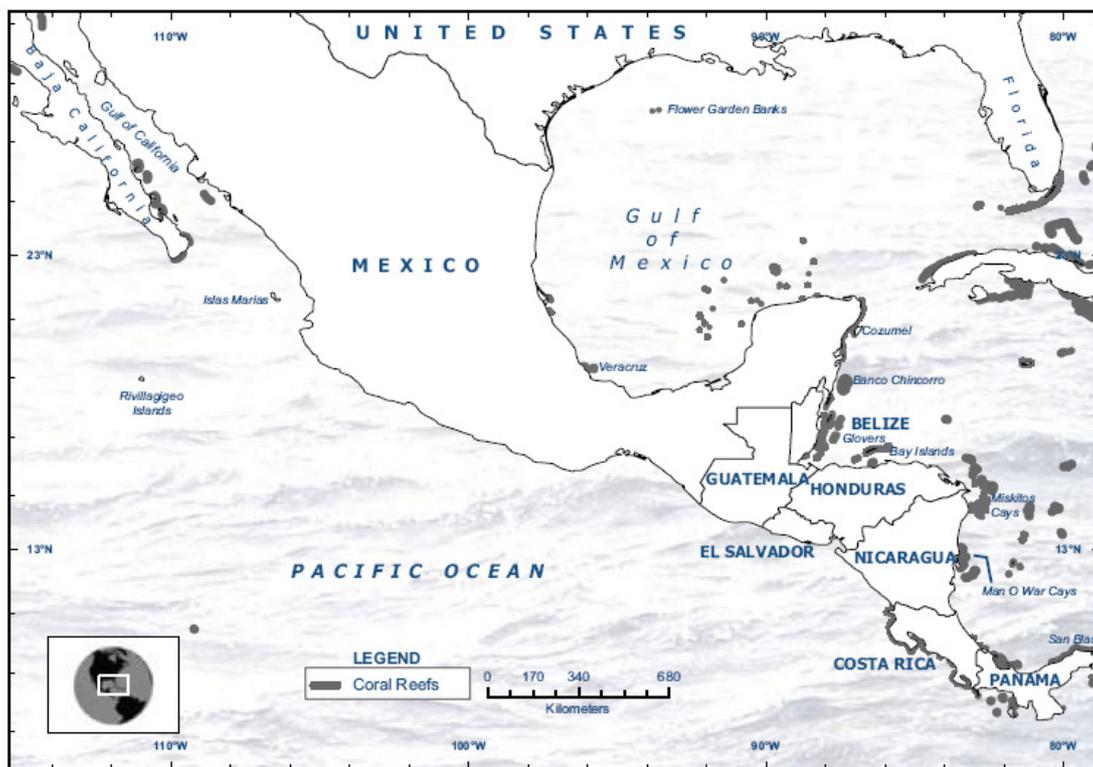


Figure 1: Mesoamerican Barrier Reef System (GCRMN 2008).

3.2 Theoretical Context

3.2.1 Theoretical framework

The study of the behaviour of humans within a system has developed into a number of theories that explain ecosystem functioning and fisheries management. This study bases its theoretical framework in three theories to evaluate the fisheries management of the CCMPA: 1. Social-Ecological Resilience (SER) to describe ecosystem management, 2. Complex Adaptive Systems (CAS) to describe fisheries governance, and 3. Common Property Resources (CPR).

It has been argued by Levin (1999; 2005; 2006) that the repetition of specific social interactions (behaviours) over time, ideally in small-scale populations, is important for cooperation and fisheries management. In these small-scale complex adaptive ecosystems and societies, feedback loops are shortened meaning that the costs and benefits of different behaviours are evident more quickly to all members of the population. In accordance with Levin's conditions for traditionally managed fisheries, Cinner *et al* (2005 a,b; Cinner and McClanachan, 2006) have provided evidence for the effectiveness of cultural norms as fisheries management tools in comparison with co-managed and top-down MPAs in Papua New Guinea. However, Cinner *et al* (2005) also point out that the circumstances that have been essential to the success of traditional management schemes in PNG include greater distances from markets, low immigration rates of people among villages, dependency on fishing as a primary means of subsistence and effective monitoring. However, these factors can be easily undermined by increased connectivity to markets, greater movements of people, and reduced dependency on natural marine resources. Where these changes have occurred, the social cohesiveness and feedback loops required to evolve and enforce social environmental norms have largely broken down (Jackson, 2007). This is the scenario that the CCMPA must be designed to deal with. Three theories can help us to analyse its success in doing so – SER; CAS; and CPR.

3.2.1.1 Social-Ecological Resilience

Social-Ecological Resilience (SER) is a theory developed for the management of ecosystems and the associated social systems in the face of uncertain change. SER aims to support the ability of an environment and dependent human communities to absorb shocks, regenerate and reorganise to maintain vital functions and processes. The theory explicitly considers that ecological and social systems are intrinsically linked, and thus the resilience of each component is related to and dependent on the linkages with other components (Adger *et al*, 2005). For ecosystems, resilience can be characterised as the capacity to provide ecosystem goods and services, i.e. the maintenance of coral structural complexity, biological diversity, and local conditions to support a functioning ecosystem. For social systems, resilience can be characterised by the human adaptability to cope with changes in the availability or qualities of the goods and services provided by coral reefs to minimise the effects on social and economic well-being (Schuttenburg and Marshall, 2008).

Managing for resilience differs from traditional coral reef management because it is less concerned to maintain functions as they are today, than to emphasise the need to protect the factors that enable the system to respond to disturbance events, such as coral bleaching or hurricanes. Managing for resilience also recognises the need to manage for future changes, which directly supports an adaptive management approach. It is important to recognise that changes in natural resources will lead to changes in natural resource use patterns. Therefore, engaging with stakeholders at this time will enable managers to build alliances and gain understanding to effectively adapt management regimes to new social and economic conditions. SER recognises that where impacts on natural resources are unpredictable, cooperative, adaptive approaches to management are essential to maintain socio-economic well-being and effective natural resource management (Schuttenburg and Marshall, 2008).

3.2.1.2 Complex Adaptive Systems

A Complex Adaptive System (CAS) is an interaction of different components within a system that exhibit a degree of self-organisation. The theory of CAS was developed at the interdisciplinary Santa Fe Institute to bridge systems theory and evolutionary sciences. It focuses on the patterns at higher levels that emerge from localised interactions and selection processes that are happening at lower levels. Therefore, it assesses the degree to which a system's features are determined by the governance of environmental and social conditions, or as a result of self-organisation (Levin, 1998). When a system is stable, the outputs tend to converge on stability. When the system is disturbed, the outputs are unstable, but the component parts will re-organise to form another stable solution. Given the multiple levels of a system, it is important to understand whether a system is resilient to changes in its ecological and socio-economic components, or whether it will proceed to a critical state of change.

CAS theory can be applied to fisheries governance, involving ecological, social, cultural, political, institutional and economic systems that all interact to create an interdependent resource. Each component part has some adaptive capacity, making the system more resilient to disturbance events. Provided each component responds and adapts to changes, the system will re-organise without compromise to the functioning of the system. However, should one component be unable to adapt to a disturbance, then the system may collapse. In the case of the CCMPA, changes to the social, cultural and ecological components of the system may be driving changes that are moving the system towards a critical state of change, i.e., a cultural shift away from natural resource use dependency; algal phase shift away from complex biological diversity. It should be noted that a fisheries system is not a true

chaotical system (nonlinear) because it has bounding parameters, making it a complex linear dynamic system.

3.2.1.3 Common Property Resource

A Common Property Resource (CPR) is a depletable resource (something that will deplete over time when under continued extraction pressure) i.e., a fishing ground that is held and used by an identifiable group of interdependent users, which excludes outsiders while regulating use by members of the local communities. Within the community, rights to access and use are likely to be equal. The rights of the user groups may be recognised legally or *de facto* (Fenny *et al*, 1998). A common property regime (*res communes*) represents private property for the group of co-owners (those that have decision-making authority) and individuals have rights to the resource. However, a common property regime is different from private property or state administration, because it is based on self-regulation by local communities (Ostrom, 2003). The group of owners and users are a social unit with definite membership and boundaries, with some interaction among members. There will often be some common cultural norms and endogenous systems of management. Within this common property regime, there are rules defining who is in the resource management group and who is excluded (Bromley, 1992). The social and political characteristics of the user groups of the resource will also affect the ability of local organisation and management of communal property.

A common property regime can break down as a result of institutional failure to control access to resources, and to make and enforce internal decisions for collective use. Pressure on a resource from external factors such as population growth, technological change or economic change because of access to new markets may contribute to the breakdown of common property regimes (Berkes, 1989). In the case of the Cayos Cochinos, following the designation of the area as an MPA, only the local communities traditionally using the marine resources had access rights to its resources. However, industrial trawlers were also allowed access to the resource because of an economically strong international export market for lobster and conch. This breach of exclusion rights has contributed to the problems now apparent for the management of the CCMPA. So CPR theory helps us to analyse how the success of MPA governance rests critically on careful handling of property rights in natural resources.

3.2.2 Modes of fisheries governance

Fisheries governance divides into three main modes of institutional arrangement: 1) centralised hierarchical governance characterised by top-down, command-and-control mechanisms; 2) market-based governance based on the forces of supply and demand; or 3) participatory governance allowing stakeholders to be involved in the decision-making process (Van Vliet and Dubbink, 1999; Gray 2005). One type of the participatory mode is co-management, which is an institutional hybrid arrangement emphasising stakeholder participation and shared responsibility for fisheries management between the government and user groups, with the aim of reducing costs, improving decision-making, and sharing of property rights more equally (Imperial and Yandle, 2005). However, such arrangements can be difficult for small-scale fishers and non-commercial interests to participate without financial resources (Yandle, 2003).

In coral reef regions, fisheries have often allowed a market-based mode of fisheries governance, following the imperatives of economic development, to undermine traditional social organisation and management systems, which contained both top-down and bottom-up elements. This has resulted in a compromise of fish species and coral sustainability as species are increasingly targeted for commercial revenue (Yandle, 2003). Because coral reef-based fisheries remain an integral part of traditional lifestyles for coastal populations, marketisation has sometimes had a severe impact on the well-being of indigent populations. To stem the ecological damage of marketisation, in many communities, MPAs have been established, often by top-down measures. But the socio-economic effects of both the problem (marketisation) and the solution (MPAs) have not been systematically researched (Cinner and McClanachan, 2006). Our project seeks to fill this gap, and in doing so, demonstrates how co-management and adaptive management structures offer the best way to reconcile conservation and social objectives.

3.3 Structural Context

In the Caribbean region, some government agencies have begun to transform their structures and operations to become increasingly favourable to participation, expressed through changes to institutional arrangements, national legislation and sectoral programmes. Simultaneously, community-based and non-governmental organisations (NGOs) have begun to assume a greater responsibility in

natural resource planning and management. This change has been a result of several factors, primarily an increasing voice of NGOs in Caribbean society, inadequate financial and human resources from central government, and persistent resource degradation. Significant international agreements and donor agency projects have also emphasised the need for participatory approaches to resource management (Renard et al., 2001). Such changes can be seen in the MBRS region where significant international collaboration (GEF/World Bank Mesoamerican Barrier Reef Project; WWF Mesoamerican Reef Ecoregion Project; ICRAN Mesoamerican Reef Alliance) has enabled adaptive management and conservation initiatives to be implemented for the sustainable use of marine resources (McField *et al.*, 2008).

Within Honduras, the management of coastal and marine protected areas applying the MBRS approach uses a framework provided by the Department of Protected Areas and Wildlife (DAVPS). This is a subsidiary department of the Forestry Development Agency (COHDEFOR) created in 1991. It assumes the regulatory responsibilities to regulate and manage resources relating to wildlife. The vision of the department is to 'guide by a strategic plan in a decentralised, participatory manner, establishing alliances with key players involved with principals of quality, research, development and innovation' (COHDEFOR, 2000). Management approaches now focus on developing private sector partnerships aimed at promoting better management practices to reduce the negative environmental impact of tourism, fishing, agriculture and aquaculture industries (McField *et al.*, 2008). Two such alliances with NGOs on the north coast of Honduras that manage marine and coastal resources are the HCRF (Cayos Cochinos) and FUCSA (Cuero y Salado Wildlife Refuge), both of which are funded by international donor agencies.

Natural resource management in the Caribbean takes place within a context that has been shaped by the region's history, culture, geography, and economic forces. This context determines the ability and willingness of individuals, groups and organisations to participate in decision-making and management. An important feature of this region that differentiates it from most others is that Caribbean societies and systems of management reflect a relatively recent convergence of contrasting cultures and associated practices, including Amerindian, African, European and Asian. Therefore, their traditions and practices are not rooted throughout centuries of evolution, but are the result of adaptations to a great diversity of influences. This has created characteristics unique to the region including, including: dependency on monoculture and exports; radical transformation of the ecosystem due to agriculture and tourism; imported cultural values; externally controlled financial capital; and ownership and rights of access controlled by the few. These influences are often exemplified in natural resource management, where formal government agencies replicate the structures of former colonial powers, while informal networks and traditional values continue to determine the patterns of resource use. Not surprisingly, in such a changing milieu, conflicts between groups emerge for management to deal with, often centring around issues of rights and access to resources (Renard et al., 2001).

3.4 Historical Context

The Cayos Cochinos are located 15 km off the Caribbean coast of Honduras, forming extensive coral reefs of the southern most part of the MBRS (Figure 2) (Harborne et al., 2001). The Cayos Cochinos consist of two main islands and thirteen smaller cays. The islands were declared as a Marine Natural Monument in 1993 and became managed by the Honduran Coral Reef Foundation (HCRF) for the conservation of its 489 km² marine resources. In 2003, the legislative decree 114-2003 re-designated the Cayos Cochinos as the only statutory Marine Protected Area (CCMPA) in Honduras, and gave responsibility for the area to the managing agency for the subsequent ten years (2004-2014). In 2004, a five-year management plan was developed by the HCRF and WWF. This management plan prohibited all commercial fishing activities within the MPA, but also established restrictions on artisanal fishing and development activities as part of the conservation effort. Garifuna communities both on the cays and mainland are traditional artisanal fishers and resource users of the MPA. The Garifuna are descendents of Africans and Amerindians who, following exile by the British from St. Vincent in 1797, settled along the Caribbean coastline of Central America (Brondo and Woods, 2007; Palacio, 2000). Honduras has the largest Garifuna population, with over forty settlements stretching along the northern coastline and islands. The Garifuna inherited the livelihood strategies of their African and Amerindian ancestors, practising subsistence fishing and farming, with some employment diversity as transnational wage labourers on fishing trawlers and fruit plantations. The mainland Garifuna communities (Neuva Armenia, Rio Esteban, Sambo Creek, Corozal) have temporary dwellings on some of the cays in the CCMPA which were traditionally used to overnight during fishing excursions. Two of these temporary dwellings now have permanent resident populations (Chachahuate, East End) making them particularly affected by the management plan regulations because they rely on fishing for subsistence and for trade.

4. FIELDWORK DESIGN

4.1 Fieldwork Schedule

The fieldwork in this thesis was designed to assess the effectiveness of the management of the CCMPA in meeting its ecological, social and governance objectives for fisheries management. For the purpose of assessing social and governance objectives, traditional marine resource users and key informants had to be identified. Therefore specific small offshore cay sites were selected inside (Chachahuate, East End) and mainland communities outside (Rio Esteban, Nueva Armenia, Sambo Creek) the MPA boundary (Figure 2). These communities are believed to be most affected by the regulations of the CCMPA because of their proximity to resources, and traditional use of fishing grounds. Heads of households, community leaders and fishers were chosen from each community, while key informants were chosen from these community sites and also from organisations located in La Ceiba.

The fieldwork was scheduled for eight weeks during the months of July-September 2007 (Table 1). One week was spent living in each community, except for East End where the researchers stayed at the research station on Cayo Menor. During these weeks, the research team resided in community houses, in groups of 2 or 3, living, eating and participating in daily community life. This meant that the researchers were seen to be involved with the community, albeit for only short periods of time, and given an appreciation of everyday Garifuna life. These home-stays were organised between the members of the tourism group in each community and Tony Ives (Operation Wallacea). The researchers stayed in the better quality houses, i.e., with the more wealthy community members, which will have affected the perceptions of other community members. The translators used by the researchers were students from the local University, C.U.R.L.A, and were therefore accepted into the communities more readily, thereby also helping the researchers to be more welcomed. The same translators were used consistently during the 2007 season (travelling and living with the researchers) which enabled them to become more familiar with the work. Table 1 sets out the fieldwork schedule, indicating the different methods employed to obtain data.

Table 1: Fieldwork schedule and summary of methods

Location	Duration	Method	Number	July				August				September			
				1	2	3	4	1	2	3	4	1	2	3	4
Rio Esteban	1 week	Household surveys	50												
		Key informants	1												
		Fishers focus groups	1												
		Individual fishers	6												
		Community map	1												
		Tourism surveys	20												
Nueva Armenia	1 week	Household surveys	50												
		Key informants	2												
		Fishers focus groups	1												
		Individual fishers	5												
		Community map	1												
		Part. Observation	1												
		Tourism surveys	20												
Historical Timeline	1														
La Ceiba	1.5 weeks	Key informants	8												
		Part. Observation	2												
Utila	1 week	Household surveys	25												
		Key informants	3												
		Community map	1												
		Tourism surveys	20												
Chachahuate	1 week	Household surveys	20												
		Key informants	1												
		Community map	1												
		Tourism surveys	8												
Cayo Menor	1 week	Key informants	1												
		Part. Observation	1												
Sambo Creek	2 days	Fishers focus groups	1												
		Individual fishers	3												
		Key informants	1												
		Tourism surveys	2												

4.2 Study Sites

4.2.1 Chachahuate

Chachahuate is the sister community of Nueva Armenia, occupying the largest of the cays in CCMPA (15° 56' 40N, 86° 28' 43 W). There are approximately 43 households with a maximum population of 200 during the peak fishing season, and an average resident population of 90 people. The island has reduced in size following Hurricane Mitch in 1998, to about 50 metres in length because it is exposed to the prevailing north-easterly trade winds. There is some tourism development with US AID and WWF sponsorship of a restaurant and cabanas, and the island is advertised in the national tourism guide 'Honduras Tips'. The reef flat is approximately 1metre deep, sloping gently to a 20 metre wall and sandy bottom. The reefs surrounding the cay also show signs of point source pollution from island latrine run-off where there is a higher concentration of sponge and soft coral cover.



Photograph 1: Chachahuate main beach, south side of the island.

4.2.2 East End

East End is the sister community of Rio Esteban, situated on the north side of Cayo Menor (16° 30' 0N, 15° 52' 0W) within the CCMPA. The community has an approximate population of 22 residents living in 19 houses along a single 200metre stretch of beach, peaking to a maximum population of 90 during the fishing season (April-September). The community has one primary school which serves all of the cay communities inside the MPA. The area also has a Honduran Navy station where the four Navy personnel employed to patrol the MPA reside. East End has some tourism development, receiving US AID funding in 2007 to build cabanas and a restaurant. The immediate marine environment consists of inner reef flats of approximately 3 metres in depth, gently sloping to a wall of about 22 metres.



Photograph 2: East End main beach, site of new cabanas for 2008.

4.2.3 Rio Esteban

Rio Esteban is a small Garifuna settlement furthest from the main city of La Ceiba on the north coast (15° 49' 60N, 86° 17' 60W), approximately 12 nautical miles from the CCMPA. The community has an estimated 630 inhabitants divided into several neighbourhoods (barrios), with one school up to secondary level. The coastal region is an area of estuarine discharge from the River Aguan, mangrove forests and mud flats creating an environment of relatively high deposition with a natural spit. The community has relatively little tourism with one hotel (currently closed) and cabanas on



Photograph 3: Main street in Rio Esteban.

the beachfront. It is the least accessible of all the study sites, requiring an off-road vehicle to navigate through a river bed during the dry season. During the wet season this river bed is prone to flooding and prevents any access to or from the community. The community does have a regular daily bus service to Jutiapa and Trujillo; however, these buses cannot pass through the river when in flood. Very recently in 2007, the Municipality of Colon has agreed to erect a bridge over the River Esteban, due for construction in 2008.

4.2.4 Nueva Armenia

Nueva Armenia is a relatively large Garifuna settlement on the north coast mainland, approximately 40 km from La Ceiba (15° 49' 60N, 86° 30' 60W). The community has an estimated 3000 inhabitants dispersed into distinct neighbourhoods, with two schools up to secondary level, a medical centre, several churches and a fish freezing plant, although this has been un-operational since 2005. There is a relatively high level of tourism with two hotels and three restaurants, and organised boat trips out to the Cayos Cochinos. It is accessible with regular daily bus services to Jutiapa and La Ceiba, and a purpose laid gravel road. The community is now split by the River Aguan which changed its course because of the severe flooding caused by Hurricane Mitch in 1998. As a result of the hurricane, new municipal housing has been built to re-house displaced members of the community. The immediate coastal zone has a tidal sand bar, mud flats and fluvial run-off. The coastal area is used as the entering point by some tourists to the CCMPA.



Photograph 4: Nueva Armenia Barrio Arroz

4.2.5 Sambo Creek

Sambo Creek is a Garifuna community only 20 km from La Ceiba on the north coast mainland (15° 49' 0N, 86° 40' 60W). It was selected as a study site because its inhabitants have also been traditional users of the CCMPA marine resources. However, this community has long-term employment multiplicity because of its proximity to the city. There are approximately 4000 inhabitants, and the community is well served with frequent buses daily and a purpose laid gravel road. There are two schools, a medical centre, an internet café, and several churches. The community has the most developed tourism facilities, with numerous restaurants and hotels spread along the beachfront. There are also long established boat trips out to the Cayos Cochinos, and a newly built zip wire facility in the adjacent rainforest. The immediate coastal area is mangrove forest and mud flats, and is an area of sedimentation from the River Aguan in La Ceiba.



Photograph 5: Main street in Sambo Creek

4.2.6 La Ceiba

La Ceiba is the third largest city in Honduras, but is regarded as the cultural capital because of its proximity to the Bay Islands. As a result, La Ceiba is the entry point for tourists travelling to the Bay Islands by ferry or air transport. The city is also the location of the HCRF, which has quick access to the CCMPA via the port, and the location of government agencies departmental offices that have institutional and legal responsibility for the marine environment. One such important government department, DIGEPESCA, has the duties of monitoring all fishing activity within the Department de Atlantida region; issuing commercial and artisanal fishing licences; and recording the supply of goods and their prices. The city is well served by regular buses and taxis, enabling frequent access for local communities to education and services. La Ceiba was badly affected by Hurricane Mitch in 1998, and has frequent flooding problems during the wet season.



Photograph 6: La Ceiba, Caribbean coast (Netropica images)

4.2.7 Utila

Utila is the smallest of the Bay Islands (11km by 4km) and the closest to the mainland (27km). The island was under the sovereignty of Great Britain until the mid 1800s, rooting the island inhabitants in Caymanian culture and dialect, with a strong Garifuna presence. The island has now become heavily developed as a centre for adventure and dive tourism in Central America, with an average 2800 visitors per year (Alton Cooper, pers comm.). The main inhabitants are now foreign immigrants from the USA and Canada, with a large proportion of temporary residents during the summer tourism season. The Bay Islands have also recently become a Tax Free Zone (2006) designed to promote touristic developments within an environmentally sustainable framework for the future. The fringing reefs around Utila remain damaged from a mass bleaching event and subsequent hurricane in 1998, and the island also suffers from unregulated artisanal and commercial fishing. In contrast to CCMPA, although Utila has a marine reserve, it is not statutory, and has no management plan. Moreover, the traditional artisanal fishers are Cayan British, not Garifuna. Corozal is the closest community to La Ceiba, and has the fewest number of fishers and least dependency on the marine resources. However, migration of fishers to cays of Utila has occurred since the introduction of the management plan in 2004, creating new frictions between fisher groups in these Cays.



Photograph 7: Ariel view of East Harbour
(www.aboututila.com)

4.3 Research Methods

The research methods were chosen to assess the effectiveness of the stated objectives for the management of the CCMPA under specific socio-economic and governance criteria adapted from the assessments used by Bunce et al. (2000) and Pomeroy et al. (2004) (Table 2). In order to generate information that would provide a broad, holistic representation of the issues affecting the governance and management of the CCMPA, a multi-disciplinary range of methods were trialled, designed especially to understand stakeholder behaviour and perspectives. A combination of methods was used to assess the effectiveness of management under each objective in order to derive a more comprehensive understanding of stakeholder knowledge and perceptions. These methods engaged with different groups of stakeholders including community groups, government departments and non-governmental organisations. The data collected using these methods will be used to complement information gathered by other researchers focusing on specific ecological and fishing aspects of the CCMPA. The extent to which each research method could be used to assess the effectiveness of the management of the CCMPA was determined during the pilot research season in 2006. The methods used during this initial scoping study phase were further developed during 2007 to ensure adaptability both to existing data, and to respond to changes as the information needs develop.

As well as specific indicator assessment, material style of life and employment multiplicity information was gathered to form the basis of a standardised socio-economic monitoring program assessing the effects of the MPA management plan on the Garifuna communities. This information should inform the managing agency of adverse or advantageous effects that may have been generated by endogenous changes in management of the MPA, or as a consequence of exogenous factors. Table 2 sets out the different research methods associated with different assessment criteria.

Table 2: Project assessment criteria, associated methods and relevant management plan objectives

Project Objective	Socio-economic assessment indicator <i>Governance assessment indicator</i>	Research Methods	Management plan Objective
1. To identify levels of awareness of the management plan among the local communities.	Distribution of formal knowledge to the community <i>Local understanding of MPA rules & regulations</i> <i>Level of stakeholder participation & satisfaction with management</i> <i>Information dissemination</i> <i>Existence and activity level of community organisations</i> <i>Degree of interaction between managers and stakeholders</i> <i>Existence of a decision-making and management body</i> <i>Existence and adoption of a management plan</i>	Household survey Key informant interviews Fishers' focus groups Participant observation	1. To provide means and opportunities for education of the ecological processes and cultural presence
2. To assess levels of satisfaction with the management plan and with the current management of the CCMPA (importance for fishing)	<i>Level of stakeholder participation & satisfaction with management</i> <i>Existence and application of scientific research & input</i> <i>Degree of interaction between managers and stakeholders</i>	Household survey Key informant interviews Participant observation Non-participant observation	2. To conserve the genetic material that avoids loss of species in the MPA, specifically those of importance for fishing
3. To estimate the impact of the management plan on employment and income for the local communities.	Household income distribution by source Household occupational structure Community infrastructure and businesses	Household survey Key informant interviews Fishers' focus groups	3. To provide means and opportunities for recreation and low impact ecotourism in harmony with the natural and cultural characteristics of the MPA
4. To consider the effects of the management plan on the social cohesion of the local communities.	<i>Level of resource conflict</i>	Household survey Key informant interviews Fishers' focus groups	4. To allow normal customs and way of life of ethnic groups living within the MPA

5. To evaluate whether knowledge of factors affecting health of the marine resources has increased as a result of the management plan.	Level of understanding of human impacts on marine resources Perceptions of local resource harvest Stakeholder knowledge of marine resources Distribution of formal knowledge to the community <i>Existence and activity level of community organisations</i> <i>Information dissemination</i>	Household survey Fishers' focus groups Key informant interviews	5. To generate information to demonstrate the effects and impacts of the MPA to the ecological balance and its area of influence to sustain management decisions
6. To investigate the suitability of existing governance and legal frameworks for successful implementation of the management plan.	<i>Existence of a decision-making and management body</i> <i>Existence and adoption of a management plan</i> <i>Existence and adequacy of enabling legislation</i> <i>Existence and application of scientific research and input</i> <i>Clearly defined enforcement procedures</i> <i>Enforcement coverage</i>	Household survey Key informant interviews Fishers' focus groups Participant observation Non-participant observation	6. To develop connection mechanisms to incorporate local populations within the MPA and its area of influence to contribute towards sustainable development

4.3.1 Detailed account of research methods

Socio-economic and governance indicators were used to examine the human populations using the marine resources, their dependency on fishing, distances to markets, percentage of the fish consumed or sold, the size of the fishing grounds and fishing effort. Research was conducted over one week at each site using five volunteer researchers and three translators. In each community a household survey was used to extract information on dependency on fishing and the percentage of fish going to local markets. This information was then triangulated with key informant interviews and fishers focus groups at each site to determine fishing pressure on reef resources.

4.3.1.1 Household Survey

Household surveys were conducted in Chachahuate, Rio Esteban and Nueva Armenia as the principal communities affected by the CCMPA. East End and Sambo Creek are not represented in this study due to time limitations and weather externalities. There were between 20 and 50 household surveys conducted at each site in order to assess community characteristics and resource knowledge and dependency on the CCMPA (N=143). Household sampling was based on a systematic sampling design, where a sampling fraction of every 5th house in each neighbourhood was surveyed. A community map (see 4.2.3.4) incorporated all neighbourhoods, private housing, community buildings, roads and paths was created by the research team which was then subsequently used for the sampling design of the household surveys, marking GPS co-ordinates for each house surveyed. The time and resources available (number of researchers, translators and days available to conduct the research) determined the number of household surveys in each community. Externalities including fiestas, extreme weather and illness also affected the numbers of household surveys conducted. The head of each household was surveyed where possible, or another adult from the household (usually female). Interviews generally took 45-60 minutes per household.

The survey was separated into six themes, covering basic demographics, household economics, perceptions about coastal resources, effectiveness of the management plan, willingness to participate in meetings, and tourism (Appendix A). The themes contained both quantitative and qualitative questions using closed and open-ended formats, and included some likert scale 'rapid answer' sections. This strategy was adopted to incorporate sections relevant for all the researchers involved in the study. To determine the household's dependency on fishing respondents were asked to list the occupations members of the household engaged in, ranking the most important occupation for income. To determine the local market for reef fish respondents were asked if they bought fish locally, and from whom they bought that fish. To determine the levels of migration in each community, respondents were asked if they had moved to or from the community, and associated reasons for migration. The economic questions followed a similar format to studies by Cinner *et al* (2005) in the West Indian Ocean region, which generated much more positive and complete responses from the communities. However, exact monetary values were not given, making the analysis broader than the specific achievements of the WIO studies. The information was translated directly as given, and some responses were further probed by the translators to provide more information, or a more detailed answer. All household survey information was recorded as individual questionnaires and entered into a database that was updated daily. GIS coordinates were also recorded at each household that was interviewed to create maps for each community of socio-economic information.

4.3.1.2 Key Informant Interviews

Structured interviews with key informants were used to examine fishing issues in more details for each community (except East End) to understand the user characteristics and dependency on marine resources. The information extrapolated included seasonality of fishing activities, markets activities, fishing grounds and gears, knowledge of management regulations and levels of interactions with the managing agency, and institutional arrangements facilitating the objectives of the CCMPA. Key informants were selected using both snowball sampling (where a respondent was suggested by a community member) and specific selection because of involvement with fishing activities or management. Key informant availability and willingness to participate determined the depth and quality of each interview. Interviews typically were 5-6 hours long, conducted over two separate meetings. Different interview scripts were used between the different groups of informants, but covering similar themes to enable some direct comparison where appropriate.

The questions were semi-structured and open-ended to allow for a coherent structure to the interview, and to develop avenues of greater depth of information where possible. The information collected was all qualitative, and will inform the next phase of research. The recorded interviews were transcribed as soon as possible after the event using Express Scribe. When interview recording was not possible, two or three researchers were used to write a transcript which was then typed.

4.3.1.3 Fishers focus groups

Fishers' focus groups were held in Rio Esteban, Nueva Armenia and Sambo Creek. The focus groups intended to be held in both Chachahuat and East End were not possible because of weather externalities. Fishers for the focus groups were principally from fishing cooperatives, selected by community leaders to participate. The groups consisted of 6-8 fishers, and the researchers used three translators, one working with the lead researcher, and two to directly translate to the other researchers present. Two or three researchers were used to document the focus group allowing the lead researcher to direct and control the participants. Time, resources and fisher commitment determined the depth of information generated by the focus groups. Extreme weather externalities also prevented further focus groups from taking place in the cay communities inside the MPA.



Photograph 8: Fishers focus group in Rio Esteban

The focus groups used a semi-structured format, with some open-ended questions for group discussion. The questions were split into themes covering fishery information, catch per unit effort data (CPUE), artificial reefs (where appropriate), management and compliance and willingness to participate in management processes (Appendix B). More sensitive and political information was moved into an individual questionnaire, and completed on a one-to-one basis between the fisher and translator at the end of each focus group (Appendix C). Although this proved to be an ineffective strategy because some fishers did not remain for the entire focus group session (n = 11), it did enable some idea of collective versus individual behaviours and perceptions to be generated.

4.3.2 Supplementary methods

4.3.2.1 Participant Observation

Participation at an ICRAN funded workshop in Roatan, Bay Islands, enabled the lead researcher to become familiar with stakeholders concerned with the Roatan Marine Park, and the issues facing the management in an area of high tourism activity (diving, cruise ships, fishing) as well as industrial and artisanal fishing. The workshop was held over two days in the evenings, and included facilitation techniques designed to generate mixed group discussions. The main topic was the introduction of a voluntary code of practice for activities in the marine park. Stakeholders represented mainly foreign interests, with some local fishers in attendance.

There was also participation in the management plan meetings held by the HCRF and The Nature Conservancy (TNC) to determine the next 5 year phase for the management of the CCMPA. These

meetings were two in a series of four meetings held once a month from June until September 2007. The lead researcher attended the second and third meetings (July and August). The second meeting discussed identifying perceived threats and potential mechanisms for mitigation of the threats, involving participation in 'carousel' style focus groups and a plenary group discussion. The third meeting debated proposed new zonation schemes for the MPA, and potential changes in the management plan. The meetings were all held in the local school in the town of Jutiapa, a neutral location midway between most communities and Ceiba, and followed a prescribed TNC method for participation that has been used for all MPAs throughout the central American region that have TNC involvement. All stakeholders involved with the CCMPA were invited, although some groups were under-represented.

4.3.2.2 Non-participant Observation

Non-participant observation was used during a meeting between fishers from the different communities affected by the CCMPA, held in Nueva Armenia between the dates of the second and third management plan meetings. This meeting was called to discuss problems affecting the fishers caused by the filming of the reality show 'Survivor' inside the CCMPA during the months of September and October. Representatives from each affected community (except Sambo Creek) attended the meeting, held in the house of the head of the fishing cooperative in Nueva Armenia. Only cooperative fishers were present, acting on behalf of all fishers in the communities. The meeting was chaired by Tony Ives, and used C.U.R.L.A University translators to write and create a letter ('carta de negociacion') that would be sent to the HCRF with demands to include the fishers and the wider communities in the benefits of the reality show. The meeting was attended by 11 fishers and 7 researchers.

Non-participant observation was also possible because of home-stay accommodation in Rio Esteban, Nueva Armenia and Chachahuate. The cabanas previously used in Rio Esteban had since fallen into disrepair, forcing the community to generate a tourism board that organised and arranged the home-stays. The tourism board of Chachahuate had developed further to accommodate visitors, forming a cooperative of families that shared cooking responsibilities for the island restaurant. This system included thirteen households, each one cooking for twenty visitors before rotating to the next household in the group.



Photograph 9: Research students learning to play dominoes with the community members of Chachahuate

The same houses were used for the home-stays as in the previous year, again through the liaison of Tony Ives with each community group. This enabled greater familiarity for the researchers and individual houses, and created a more understanding environment. However, it was an experience limited to specific, and often the wealthiest, families.

4.3.2.3 Historical Timelines

Historical timelines were conducted in Nueva Armenia and Sambo Creek. No others were possible because of time limitations and translator availability. The timelines were held with two distinct demographic groups: the oldest members of the community and the youth in the community. The timeline was used to further understand the history of the relationship between the marine resources and the communities, linking factual changes in each community with personal memories of the same events. A large sheet of paper was laid out in the centre of the group, with a line through the middle to mark on important dates. The two



Photograph 10: Researchers and translator conducting a timeline with young community members in Nueva Armenia.

halves above and below the line were then split to represent environmental changes and social changes in the community. A semi-structured format was then used to direct the discussion towards certain topics, including traditional fishing activity, gear changes, perceptions of environmental changes and key social events that individuals remembered occurring in the community. The accuracy of the accounts recalled is limited by the subjectivity of memory, but they provided a framework to cross-reference actual changes that have altered and shaped life for each community. This method enabled researchers to begin to understand the complexity of the social systems that govern the communities, and when, why and how changes occurred in livelihood strategies dependent on marine resources.

4.3.2.4 Community maps

The community maps were created for household surveying sampling were also used to trial a method of data collection that used wealth indicators to assess any relationship between location and status/power in the communities (i.e. Patronato members; heads of fishing groups). One researcher and the translator team walked around the community with a local 'guide', and asked to be told where the members of the Patronato lived, where the heads of community groups resided, and where fishers' houses were located. The information would then be used as an information layer on the map to determine whether power within each community is constrained to certain geographical areas. This technique was partially successful, with no clear indication of any power patterns in the communities. [This was work done by Jessica Wallington who was looking at empowerment in the communities. The results are not discussed within this report].

4.3.2.5 Gear and Landing Studies

Gear and landing studies were collected by WWF Central America during the months of July and August. Abundance, composition and length of the fish landings were recorded in five sites (Chachahuate, East End, Rio Esteban, Nueva Armenia, Sambo Creek). The fishers were approached as they returned from a fishing trip and asked if their catch could be examined. All fish catch was digitally photographed including a scale for size. Weight was measured using a portable hanging scale of each fish landed. A total of one week was spent at each community. However, the results of the gear and landing study is not yet available and will therefore not be discussed in this report.

4.4 Fieldwork Limitations

There were some limitations which affected the quantity and depth of information collected during the 2007 season. First, although the translators worked effectively and efficiently with the research group, their time was split between all the researchers, meaning only three researchers could be collected data at any one time making progress slow. However, the remaining researchers used the time for data entry and preparation of other work. Also, the translators worked incredibly hard and at times suffered from fatigue. Moreover, key informant interviews were sometimes difficult to schedule with the translators in La Ceiba because of the translators' priority university commitments. Second, two hurricane evacuations prevented two fishers focus groups from taking place in Chachahuate and Utila, though a replacement fishers focus group was organised ad hoc in Sambo Creek during one of these evacuation periods owing to its proximity to La Ceiba, the site for evacuation. Third, the need for student researchers to interview key informants compounded problems of informant availability, making more than one visit necessary in order to complete the information needs of the whole group.

5. RESULTS

It should be noted that the socio-economic data in this report is not exhaustive, and the discussion is based on relatively small samples of households and fishers. The data has not been statistically analysed, and the results presented here are comparative analyses of household surveys.

The results will focus primarily on the three study sites within the catchment area of the CCMPA: Chachahuat (4.2.1), Rio Esteban (4.2.3) and Nueva Armenia (4.2.4). East End (4.2.2) will not be discussed in this report because data collection was interrupted as a result of hurricane evacuation procedures. Sambo Creek (4.2.5) will be analysed and discussed where fishers' focus groups are incorporated into indicators. La Ceiba (4.2.6) served only as the location of the majority of key informant interviews, and these shall be referred to by organisation. Utila (4.2.7) will be analysed and discussed as a comparison for the principal three sites, but not graphically represented.

The results are split into three main sections:

1. A summary of the main findings for the three principal study sites.
2. A thematic comparative analysis of the project objectives.
3. Assessment of the effectiveness of the management plan objectives based on the indicator results.

5.1 Results Section 1: 2007 Household survey results summary for Chachahuat, Nueva Armenia and Rio Esteban

5.1.1 Chachahuat

The community of Chachahuat is predominantly a fishing community, with 84% of households interviewed (n=20) engaging in fishing as an economic activity. Tourism (32%) and remittances (32%) are the other primary sources of income (Figure 1). Of these, fishing was ranked as the most important activity for income (62%). There is a high degree of household employment multiplicity, 79% of households are engaged in two or more income earning jobs. Economic activities have changed over the last five years, with only 38% of households continuing with the same activities. 21% of households have moved away from informal jobs (pulperias, cutting hair), whilst 26% are no longer reliant on remittances. This is a result of employment diversification into tourism related activities. Significantly, only 5% of households no longer engage in fishing activities. Fishing and tourism are regarded as the only income generating opportunities for men in this community, and cooking, tourism related activities and buying/selling fish are the opportunities for women. The average monthly expenditure (\$240.76; 4502.10 lempira) was the highest of all the communities. This reflects the additional costs associated with transporting food and fuel from the mainland to the islands. The awareness of the management plan was unexpectedly low (55%) when fishing is the principal activity in this community. 70% of respondents expected only members of the Patronato to attend meetings concerning the CCMPA, but only 50% were happy with the current community representation. However, 80% of all respondents would be willing to attend meeting if they were made aware of them. Similarly, 75% of respondents would be willing to engage with monitoring efforts coordinated by the HCRF.

5.1.2 Rio Esteban

Rio Esteban is the community least reliant on marine resources from the CCMPA. Only 11% of households surveyed (n=47) engaged in fishing as an income generating activity. The main sources of income were from construction (66%), with some farming (8%) and salaried employment working for the municipal government in Trujillo (11%) (Figure 2). Of these activities, construction was ranked as the most important for income (46%), followed by farming (33%), and salaried employment (14%). Fishing was not highly ranked as an important source of income (7%). There is a moderate level of household employment multiplicity, with only 42% of households working in two or more activities. There has been relatively little change in economic activities over the last five years, with 70% of households involved in the same activities, with only a small decrease in both fishing (4%) and farming (6%). The greatest change has been a decrease in the number of households in salaried employment (10%). This was as a result of political changes leading to personnel alterations. Surprisingly, income generating opportunities for men were fairly evenly split between fishing (35%), farming (26%) and construction (33%) given that few households listed fishing and farming as income activities. Cooking was the main opportunity listed for women (46%), followed by washing clothes (19%) and farming (13%). The average monthly expenditure was the lowest of all the communities (\$173.2; 3235.55 lempira). Awareness of the management plan for the CCMPA was quite low (43%), and 62% of respondents expected that only members of the Patronato would be invited to attend a meeting about

the CCMPA, and 15% suggested that fishers would be invited. However, 70% of the households were happy with the representation of their community. 68% of households would be willing to attend meetings, and only 57% willing to become involved with monitoring activities of the marine resources.

5.1.3 Nueva Armenia

The majority of households surveyed in Nueva Armenia (n=49) were reliant on remittances and other sources of construction work (71%) to generate income. Only 12% of respondents listed fishing as an income generating activity (Figure 3). 14% of households are engaged in informal jobs, more than any other community. Surprisingly, fishing and remittances were almost equally ranked as the most important source of household income (31%; 34%), with informal jobs accounting for 22%. Household employment multiplicity is moderate, with only 50% of households engaging in more than one income generating activity. There has been relatively little change in activities over the last five years, with 68% of households still involved in the same activities. The greatest change has been in the number of people employed in salaried jobs, similar to Rio Esteban (18%). Interestingly, fishing was most frequently given as an income generating activity for men in this community (61%), even though few households engage in fishing. Similarly, buying and selling fish was also listed as the principal income opportunity for women (49%). Farming was listed as an opportunity for both men (19%) and women (11%), and only 4% of households engage in farming as an income activity. The average monthly expenditure was relatively high (\$205.72; 3846.87 lempira) but this is most likely because NA and Cha are sister communities where many families have dual occupancy in both places. Awareness of the management plan for the CCMPA was fairly low (49%), and less than half of respondents suggested members of the Patronato to attend meetings about the CCMPA. However, 73% of households said they were happy with the community representation. 71% of respondents said that they would be willing to attend meeting if they were made aware of them, but only 63% would be interested to be involved in monitoring of the marine resources.

5.2 Results Section 2: Thematic comparative analysis of the project objectives

5.2.1 PROJECT OBJECTIVE 1: To identify levels of awareness of the management plan among the local communities.

In order to assess the effectiveness of the management plan in achieving its stated socio-economic objectives, first it is critical to assess the level of awareness of the management efforts within the affected communities. To do this, specific questions were designed based on socio-economic and governance indicators.

5.2.1.1 Indicator: Local understanding of MPA rules & regulations

This indicator is used to discern the local understanding of the rules and regulations of the CCMPA, and to assess whether the community members understand the intent of those rules. It is a fundamental assumption that the greater the understanding of the rules and regulations, the greater the chance for successful compliance by locals for the MPA. Stakeholders may violate the rules if they do not fully understand them, or agree with why they have been instigated (Pomeroy *et al*, 2004).

This indicator was assessed at both the community wide level, and for fishers as a specific user group of the CCMPA resources.

The community level understanding of the MPA rules and regulations was assessed first as a measure of general awareness of the management plan (Household Survey Question 39). Figure 3 illustrates that the majority of the members of Chachahuate are aware of the management plan (55%), whereas for Rio Esteban and Nueva Armenia the majority of people in these communities are not familiar with the plan or its rules and objectives (57%; 52%). Therefore, there is a difference in awareness between the communities inside the CCMPA and on the mainland coast which relates to differing levels of resource dependency as discussed under Project Objective 3.

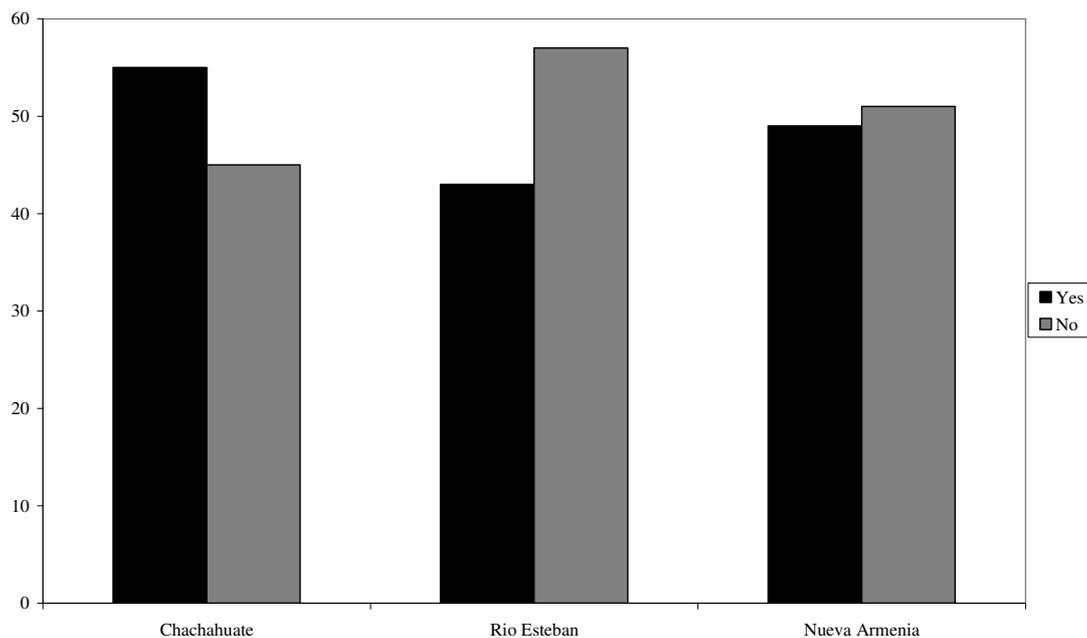


Figure 3: Average awareness of the management plan and processes in each study site

Coupled with awareness of the management plan by individuals, respondents were also asked who they would expect to attend a meeting concerning the management plan (Household Survey Question 40). The results (Figure 4) show that in all three communities, either the Head or members of the Patronato would be expected to be the main attendees at such meetings, and also fishers as the specific user group affected by the CCMPA. Very few respondents identified themselves as possible attendees. These results suggest that the wider community do not feel it is their role to participate in meetings about the management of the CCMPA, which may explain low awareness levels of the management plan.

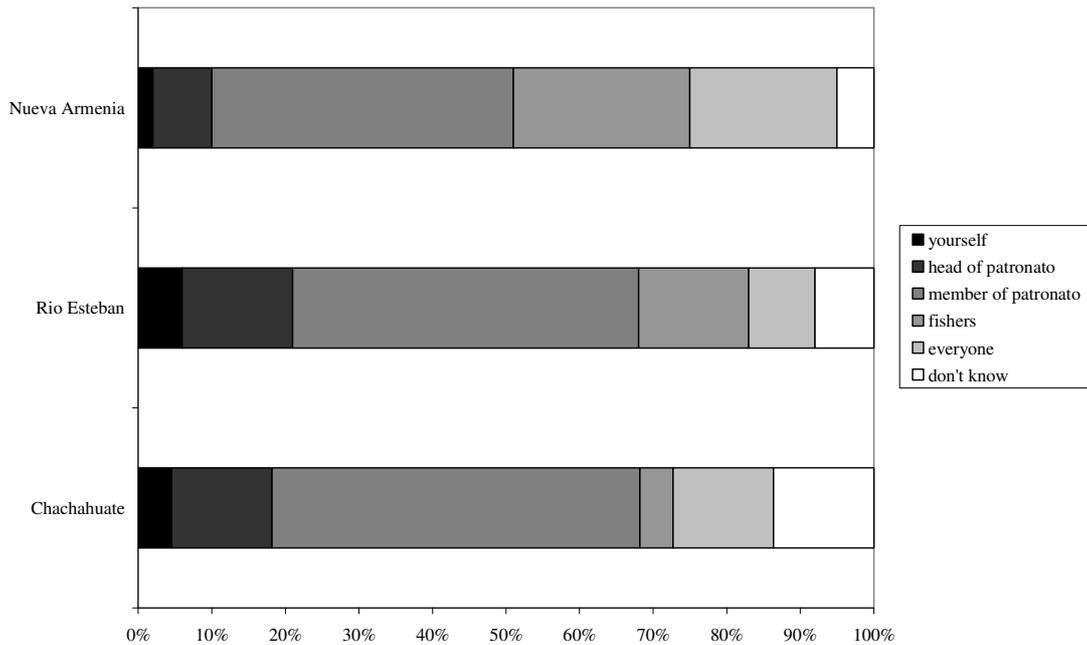


Figure 4: Expected participants for meetings concerning the CCMPA in each study site.

The awareness of the fishers in each community was much greater than the community as a whole. All fishers interviewed were aware of the rules and regulations stated in the management plan (Rio Esteban n=8; Nueva Armenia n=8; Sambo Creek n=4). This is because as the user group most directly affected by the management plan, there has been a greater focus of effort directed towards them from the HCRF. All collective respondents during the focus groups were able to accurately list gear restrictions, closed fishing grounds, seasonal closures and prohibited species as they are detailed in the management plan. There was some discrepancy between communities for when each restriction was imposed, and the locations where it is effective.

Individual fishers were also asked where they learned about the rules and regulations of the CCMPA (Individual Fishers Survey Question 9). The results (Figure 5) show that the majority of information has been communicated by the HCRF, but also the Patronato system and word of mouth play a strong role in spreading awareness amongst fishers in each community.

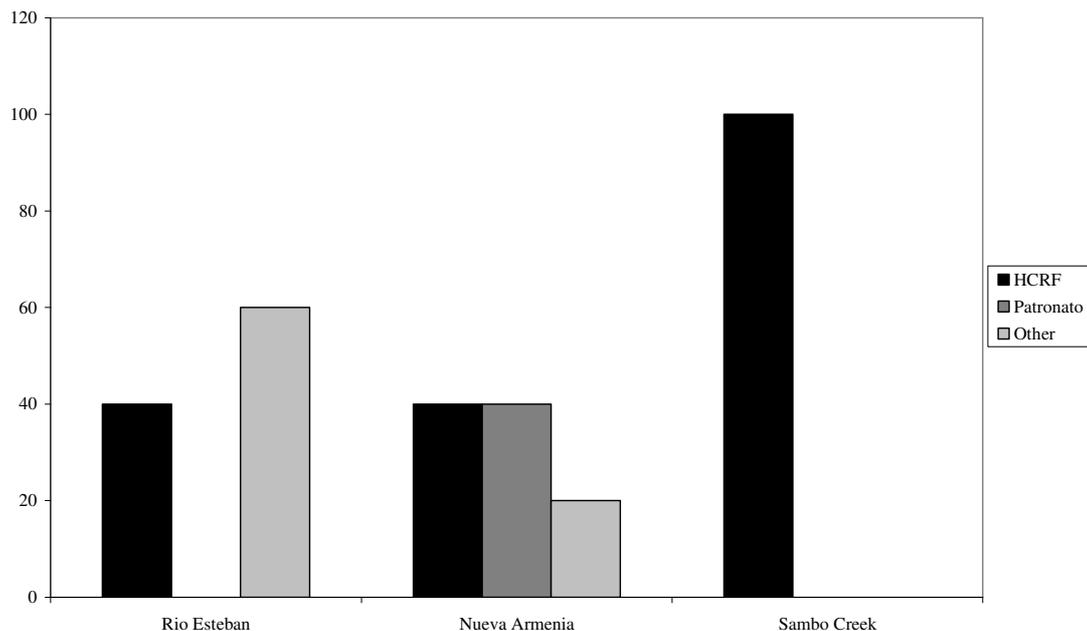


Figure 5: Sources of information for fishers' awareness of the rules and regulations of the CCMPA in each focus group study site.

Despite the good level of awareness of fishers, and acknowledgement that information has been provided to them by the HCRF, Table 3 shows that most of the individual fishers would prefer to change the way that information is exchanged between the stakeholders (Individual Fishers Survey Question 12). The most important mechanisms for change would be for more transparency of information given about the activities of the HCRF to the whole community (not just information concerning fishing given only to the fishers). It was seen as important for the HCRF to regularly meet with the communities to discuss management activities to improve the sense of respect given to the fishers from the HCRF.

Table 3: Proportion of individual fishers who would prefer a change in the way information is exchanged between the HCRF and themselves.

Community	yes	no	How would you recommend changing info exchange?
Rio Esteban	3	2	Radio, TV, Newsletters
Nueva Armenia	5	0	Always use the same people More collaborative Whole community together with HCRF Have information about everything
Sambo Creek	2	0	Whole community together with HCRF

When asked if the fishers would be willing to be involved in regular meetings with the HCRF about the management plan and fishing restrictions, the vast majority of fishers agreed they would participate (Individual Fishers Survey Question 13) (Table 4). Of those fishers who declined to be involved in meetings, the reason given was a feeling of being unable to contribute to the meeting.

Table 4: Proportion of individual fishers willing to participate in meetings about the management plan of the CCMPA in focus group study sites.

Community	yes	no	If no, why not?
Rio Esteban	80	20	Feel unable to contribute
Nueva Armenia	100	0	
Sambo Creek	100	0	

There was a general consensus of positive support for the management plan and fishing regulations from all fishers in Rio Esteban and Nueva Armenia (Individual Fishers Survey Question 11) (Figure 6). However, none of the fishers in Sambo Creek supported the rules and restrictions of the management plan. Sambo Creek has a smaller number of fishers than any other community in the CCMPA catchment area, and also uses the smallest of the cays (Cayo Bolano) during fishing trips, but there are no temporary dwellings on the cay. The community also recently underwent a change in the Head of the Patronato whose primary areas of interest are tourism and development rather than fishing.

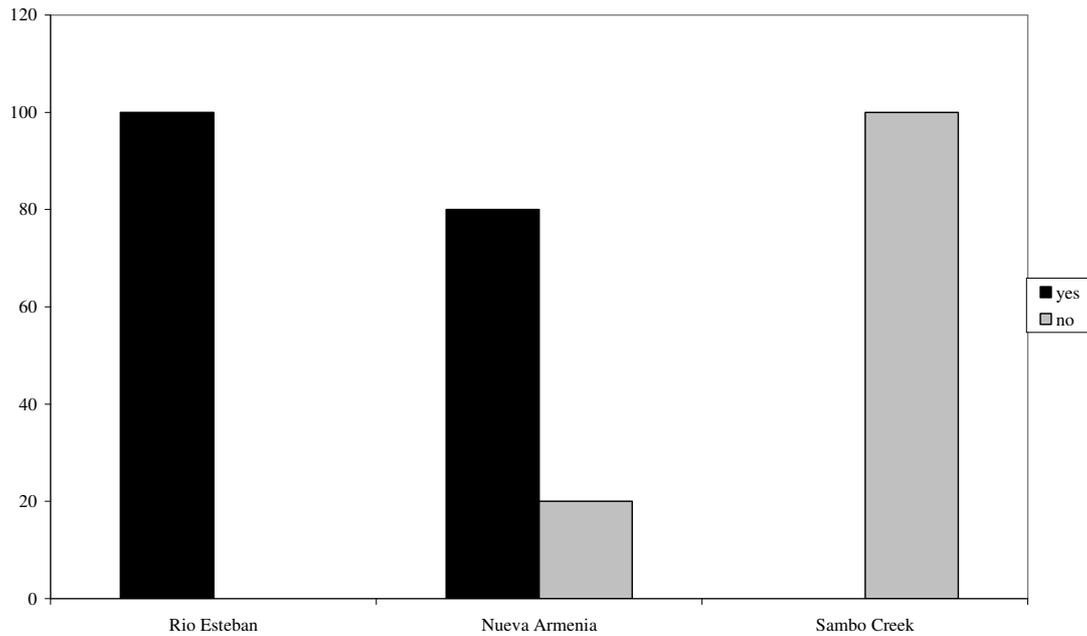


Figure 6: Proportion of agreement with the rules and regulations of the CCMPA for fishers in focus group study sites.

The fishers were then asked for reasons why they did/did not support the management plan as detailed in Table 5. The fishers are aware of the ecological benefits of the restrictions for species recovery and long-term sustainability of the resources. However, their lack of support for the MPA was explained by economic reasons such as no alternative incomes to fishing, and a reduced quality of the produce outside the restricted zones.

Table 5: Reasons given for support or opposition to the rules and regulations of the CCMPA.

Community	Reasons for regulations	Reasons against regulations
Rio Esteban	benefits reproduction lobster recovery future fish	
Nueva Armenia	protect the environment reproduction lobster and conch recovery	
Sambo Creek		no alternatives better products in the restricted areas

5.2.1.3 Indicator: Information dissemination

Information dissemination is a method to encourage stakeholder compliance, and is a measure of the effectiveness of capacity-building efforts by the managing agency for local stakeholders to understand the objectives, rules and regulations, benefits and enforcement arrangements of the MPA (Pomeroy *et al*, 2004). Information dissemination is critical to change resource user behaviour and attitudes towards the MPA, and has an influence on the level of compliance with the management regulations. It should be implemented alongside education and training programmes.

Community level dissemination is an important component for the distribution of information from the managing agency to the local stakeholders. Therefore, it is important to assess the frequency of community meetings and the inclusivity of any such event (Household Survey Question 37). Figure 7 illustrates the distribution of responses regarding the frequency of community meetings in each study site. There is a discrepancy between the respondents in each community with regard to how often meetings are held involving the whole community, and these responses reflect the level of involvement of individuals in the community. However, it is clear that meetings for the whole community do occur, but only attended by the majority of community members every two weeks or less. A regular fortnightly meeting was the most commonly given frequency response.

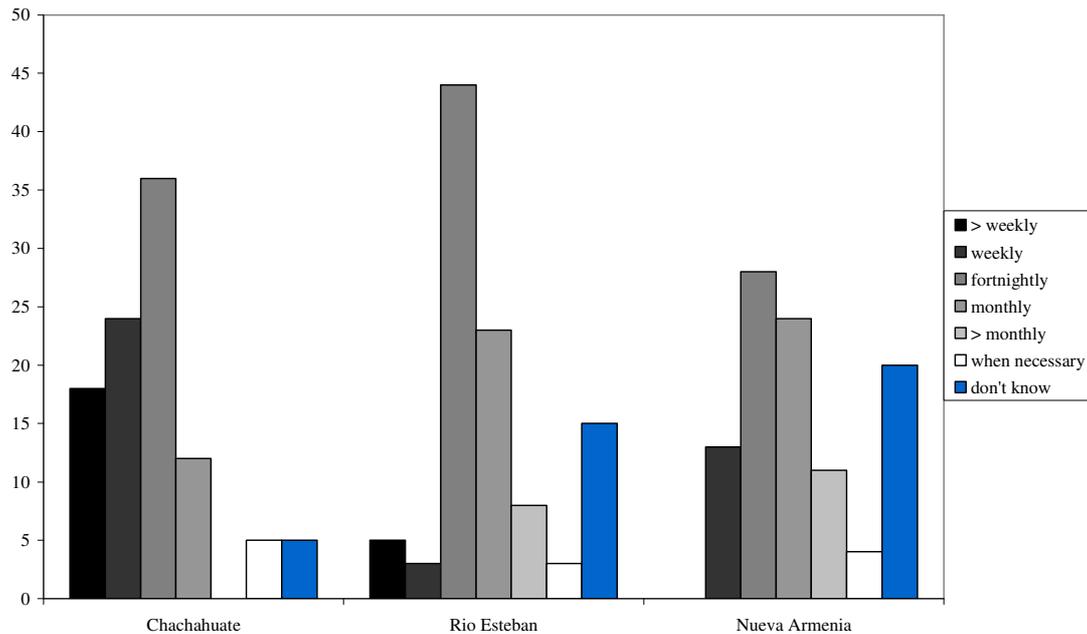


Figure 7: Frequency of community meeting in each study site.

Other methods of informal information dissemination within the communities occur via the groups which exist in each location (Household Survey Question 32). Table 6 shows the frequency of groups as mentioned in each community, representing the proportion of members in each group. Of all the groups in the communities, punta dancing and cooking groups are the most widely acknowledged and active groups. These groups are dominated almost entirely by women, passing information about community issues and Patronato decisions by word of mouth around the households. This reflects the matriarchal nature of Garifuna communities, where women are the most active members in each household within the community social structure. Therefore, it would be important for the HCRF to recognise the role of women in these communities, and to include these groups as avenues by which to pass on relevant information about the health of the marine environment.

Table 6: Frequency of different groups in each community

Type of group	Chachahuate	Rio Esteban	Nueva Armenia
Patronato	9	22	13
Fishers	6	16	12
Tourism	3	5	4
Health	1	3	4
Dance	12	21	31
Cooking	11	11	5
Womens	1	14	0
School	1	7	2
Water	0	7	9
Youth	0	0	2
Business	0	0	3

Specific information dissemination for particular user groups is also an important avenue for knowledge transfer for HCRF and community activities and issues. There are two levels of fisher information dissemination: 1. fishing cooperatives which work more closely with the HCRF; 2. individual fishers reliant on information passed from the cooperatives and Patronato. Fishers will also hold separate meetings within the communities as and when important issues arise. During the field season in July 2007, the fishers of Chachahuate, Rio Esteban and Nueva Armenia organised a meeting held in Nueva Armenia to discuss the difficulties resulting from the filming of the reality television show 'Survivor', produced by the Italian company Magnolia. The outcome of the meeting was a letter written on behalf of each community to Adrian Oviedo, the Director of the HCRF. The 'carta de

negociacion' listed activities that would benefit the communities by providing a service to the production company during the weeks of filming. These services included transportation of crew and equipment, and provision of food for the crew. The meeting was dominated by fishers from cooperatives, with no individual fishers present.

5.2.1.4 Indicator: Distribution of formal knowledge to the community

The distribution of formal knowledge to the community is a measure of the awareness by the local communities of the information generated by scientific research about MPA use and impacts on the ecosystem. Sharing information generated by the scientific research is critical for stakeholders to understand why regulations are imposed, and to have trust and confidence in the management decisions. It also improves communication between management and local stakeholders. Well understood scientific research can lead to improvements in the management of MPAs (Pomeroy *et al*, 2004).

The only distribution of formal knowledge to each community has been limited to fishers as the main user group of the marine resources. However, meetings between the HCRF and fishers are not frequent, and only occur when there are new regulations, or changes to regulations. When these meetings do occur, the HCRF rely on both the fishers of the cooperatives and the Heads of the different Patronatos to invite other individual fishers in the community. It is important to note that these are contacts that were made in the community over five years ago prior to the implementation of the management plan, and do not reflect the current individual and cooperative fishers or Patronato members.

The principal method of disseminating information formally to the communities occurs during the management plan meetings (2002 and 2007). These meetings (every five years) are an opportunity for all the stakeholders affected by the CCMPA to discuss the regulations, and to make amendments as necessary based on information from the ecological, social and governance indicators. In 2007 four such meetings were held in Jutiapa, a neutral town located between La Ceiba and the Garifuna communities. The meetings were held once a month from May until August, allowing time for the TNC to produce targets and revised management regulations. Community representation at these meetings was poor; no Heads of Patronatos were present, only cooperative fishers. This is likely to be a result of the invitation process for the meetings which relied on the original community contacts that were made for the previous management plan meetings. This is indicative of a lack of willing from the communities, and a lack of effort to attain a greater participation rate from the communities by the HCRF. It also illustrates that the wider community do not share an interest in the CCMPA, and it is viewed only as an issue that would concern the fishers.

As discussed under Project Objective 1, the fishers would like to see more information being passed from the HCRF to themselves in a more formal and structured manner, holding regular community meeting with specific personnel from the HCRF.

5.2.1.5 Indicator: Existence and activity level of community organisations

The ability of a community to effectively participate in management decisions for an MPA is largely determined by the existence and organisation of suitable groups within the community. This organisation is vital for representing community interests to management, and influencing the outcome of management decisions (Pomeroy *et al*, 2004). Understanding community level groups and activity levels can facilitate greater participation in management, and lead to greater compliance with MPA rules and regulations.

Currently there are only two suitable groups that would be able to take part in management decisions for the CCMPA: 1. the Patronato, the local community-level government organisation, and 2. fishers' cooperatives.

1. The Patronato consists of one Head member, and up to twelve members elected from the community, each with responsibility for certain community affairs, i.e., health, water, business. Each Patronato will serve a term of two years before an election is called. The members of these community councils remain fairly constant, being re-elected to serve under a different position. However, it is clear from the attendance at management plan meetings that only fishers serving as current members of the Patronato for each community are concerned with the CCMPA or its management. It is important to re-engage with the Heads of each Patronato to become involved with HCRF activities.

2. The fishers' cooperatives have a high degree of organisation within themselves, often contributing a percentage of earnings into a shared bank account to pay for new equipment, or repairs of shared equipment. This level of organisation has occurred as a result of a donation by the Japanese government in 2004 via the project MODEPESCA. This was specifically designed to aid artisanal fishers along the coastline of the Municipality of Atlantida. The project offered twenty-five foot boats and fishing equipment (nets which have since been banned under the rules of the management plan) for fishers only in cooperatives. Therefore, many individual fishers formed cooperatives in order to qualify for these funds. Cooperatives from both Sambo Creek and Nueva Armenia received the greatest proportion of help from this project, and have since started to use the boats to transport tourists to the Cayos Cochinos. These cooperatives were also approached by the HCRF during the initial management plan meetings, and remain the principal contacts that have communication with the HCRF.

Therefore, both the Patronato and fishers' cooperatives would provide strong organisations from all communities that could participate to a greater degree in management decisions and planning. However, these groups would also need to represent the views and opinions of all fishers in each community, and the Head of each Patronato would need to be constantly involved with HCRF activities in order to transfer information to the wider community. This would improve community understanding of the HCRF and the management plans, and also encourage greater community interest in the marine resources.

5.2.1.6 Indicator: Degree of interaction between managers and stakeholders

This indicator is a direct measure of the number of regularly scheduled meetings between managers and stakeholders to discuss compliance with the management plan. It is important to recognise stakeholder concerns and grievances with the regulations of an MPA in order to improve compliance (Pomeroy *et al*, 2004).

There is very little interaction between managers and stakeholders on a regular basis. Meetings are only held when there is a specific issue to be addressed, and only with the specific user group affected by any changes in regulations. Such meetings are held in the community, but the results are not disseminated beyond the immediate group present. There are no post-meeting newsletters or minutes that are distributed to the community.

Unusually, as a result of the fishers' meeting in Nueva Armenia as mentioned under Indicator 5.1.2.1.3, some of the fishers from Rio Esteban and Nueva Armenia instigated a meeting with the director of the HCRF during July 2007 to address the specific issue of the filming of 'Survivor' in the CCMPA. The fishers believe that there is an unfair transfer of economic benefits as a result of the filming. It is clear that there is dissatisfaction with the HCRF for its negotiations with the production company on behalf of the communities to receive compensation for lost fishing days. The result is suspicion of corruption preventing the communities gaining any benefit from the filming of the reality show. The filming is viewed as a tourism-related activity, and as such the communities believe that they are entitled to receive some of the benefits through transportation of crew and equipment to the Cayos Cochinos, and cooking for the crew during the weeks that filming occurs. Significantly, the Head of the Patronato of Sambo Creek also attended this meeting with the HCRF to discuss the tourism based issues.

Suspicion and lack of trust of the HCRF has been compounded by the lack of transparency of the financial gains not only from the reality show, but also from the entrance fee paid by visitors to the park. The entrance fee to the park has created controversy since its inception in 2004 because the communities believed that the money generated was supposed to be directed towards them via alternative livelihood options. However, a change to the legal document required that the funds generated from the entrance fee are to be used in conservation programmes as this is the main objective of the CCMPA. The fishers in these communities feel that the change in the use of entrance fee money was not clearly communicated to them, and therefore, the majority of community members perceive the HCRF personnel as dishonest and to be 'lining their own pockets'.

5.2.1.7 Indicator: Existence of a decision-making and management body

The existence of a decision-making body is the recognition of an institution that governs and manages a protected resource, and is responsible for establishing and enforcing rules and regulations. A legal decree for an MPA will enable improved management of the resources and accountability for all its decisions (Pomeroy *et al*, 2004). This is important for local stakeholders to be able to protest against decisions that have negative outcomes.

The CCMPA, decreed as a protected area in 1993, has since been managed by the Honduran Coral Reef Foundation (HCRF). The HCRF is responsible for the long-term strategic planning of the CCMPA to ensure conservation of its biodiversity, working under the authority of COHDEFOR. The HCRF employs ten full-time members of staff to oversee all its duties, but has no staff member as a community liaison officer. The role has been filled as far as possible by the Director of Science and Management, Adoni Cubas. As part of the responsibilities administered to the HCRF, a management plan for the CCMPA was to establish rules and regulations for the conservation of the marine resources, which should then be passed to COHDEFOR before becoming legally instated.

5.2.1.8 Indicator: Existence and adoption of a management plan

The existence of a management plan is the formal document that states the goals and objectives that are to be achieved by the managing agency. It also documents the institutional structure of the management system and the management measures used to achieve these objectives. It is necessary to understand the strategic direction of the MPA, and to measure its effectiveness based on its ability to achieve the stated goals (Pomeroy *et al*, 2004). The legal adoption of the management plan also means that there is legislative support for the plan to be implemented, and accountability for its effectiveness.

The first management plan produced by the HCRF stated the objectives and management measures that should be implemented to achieve these goals. The plan highlighted the main programme of activity as the conservation of the biodiversity of the CCMPA. There are also two stated sub-programs: 1. terrestrial conservation of timber materials, and 2. management of fishing activities. The second sub-program was designed to provide alternatives to diversify fishing activities and alleviate pressure on the CCMPA resources, without significantly impacting on the local culture of the Garifuna.

Within the context of the management plan there are also stated aims to achieve socio-economic well-being for the local communities that benefit from the marine resources:

1. To assess the potential for developing alternative sustainable incomes for the local communities.
2. To assess the cultural and environmental impacts of development occurring in or adjacent to the MPA.
3. To assist in the preparation of funding applications to support the research and community development program of the HCRF.

The plan outlines base-line socio-economic and technical surveys to be completed in order to make these assessments and to incorporate any possible changes to the management plan. This is in accordance with its stated adaptive management process for the recuperation of the marine resources.

5.2.2 PROJECT OBJECTIVE 2: To assess levels of satisfaction with the management plan and with the current management of the CCMPA.

5.2.1.2 Indicator: Level of stakeholder participation & satisfaction with management

This indicator is a measure of the active involvement in management decisions or activities by the local stakeholders, and their level of satisfaction with their involvement. Active participation can improve the success of the MPA because if stakeholders feel that their views and opinions are considered important, and feel ownership over the resources, they are more likely to support the MPA (Pomeroy *et al.*, 2004). Similar to many MPAs, an important objective of the management plan for the CCMPA is to educate the local communities in the potential benefits that will result from the MPA. Satisfaction with management is a useful indication of evidence of this objective.

As discussed under Project Objective 1, levels of satisfaction with the management plan and its management are directly linked to the level of involvement of the communities with the HCRF. For the wider community, the vast majority of households in each study site would like to be involved in discussions and meetings concerning the CCMPA (Household Survey Question 43). The community wanting the greatest level of involvement was in Chachahuate (80%), the community most affected by the regulations of the management plan. Rio Esteban (68%) and Nueva Armenia (71%) had similar responses. Of those respondents that did not want to be involved in meetings, the most commonly given reasons were lack of time, a lack of interest, and feeling that they would be unable to contribute. The majority of respondents were happy with the representation of their interests by the Patronato and others that are present in meetings (Household Survey Question 44). Table 7 shows that there is least satisfaction in Chachahuate, possibly as a result of the greater dependency on fishing in this community to be discussed under Project Objective 3. Chachahuate also had the greatest proportion of respondents who did not know about representation of the community. This suggests that in Chachahuate there is the least amount of community meetings and opportunities to disseminate information to the wider community.

Table 7: Proportion of households happy with the representation of the community on CCMPA issues.

	% yes	% no	% don't know
Chachahuate	50	30	20
Rio Esteban	70	15	15
Nueva Armenia	73	20	7

There is a relatively high degree of willingness in each community to become involved in monitoring with the HCRF of marine resources (Household Survey Question 45, Question 46). Table 8 illustrates the lack of involvement with current monitoring efforts, and the proportion of respondents who would undertake some level of monitoring activity. This would suggest that current participation with management activities is low in all communities. Rio Esteban has the least willingness to participate, and it is also the community with the least awareness of the management plan.

Table 8: Proportions of each community involved in monitoring and willing to participate in monitoring

	% involved in monitoring	% not involved in monitoring	% willing to be involved in monitoring	% not willing to be involved monitoring
Chachahuate	10	90	75	25
Rio Esteban	4	96	57	43
Nueva Armenia	6	94	63	37

Support and satisfaction with the management of the CCMPA amongst the fishers is very low. Given the level of awareness of the rules and restrictions and majority support for the management plan, all fishers were also aware of consequences of rule-breaking and distrustful of the enforcement conducted by the Honduran Navy. The actual consequences of rule-breaking were not clear, and subsequent punishments were all markedly different and irregular as described in the recollections of fishers' encounters with the Navy having been caught rule breaking. However, all fishers were in agreement that the enforcement was inappropriate and unfair. Fishers from Sambo Creek told how the Navy enforcement guards would watch and wait for the fishers to catch fish or shellfish in a legally allowed

area and sail across an illegal area (not fishing), before stopping the fishers and seizing their catch. Both fishers from Rio Esteban and Nueva Armenia talked about different individual fishers from each respective community whose equipment had been seized and taken to Roatan, the Municipality of the Bay Islands that has administrative responsibility for the Cayos Cochinos. Here it is stored awaiting a court hearing for the fishers to appeal for its return. However, these two communities also fall under two different administrative regions, Rio Esteban belongs to the Municipality of Colon, and Nueva Armenia belongs to the Municipality of Atlantida. Therefore, this extreme level of enforcement is viewed particularly badly because all fishers say that they cannot afford to travel to Roatan, and consequently lose their ability to fish. Some fishers have also claimed to have been shot by the Navy, although the researchers have no evidence of this claim. It is evident from all three communities that the top-down enforcement provided by the Navy is not supported, and is enforcement that is believed to use excessive and unnecessary force as a mechanism for control through fear.

A principal strategy of the management of the fishing sub-program includes vigilance and monitoring to be done with the support of park rangers and local volunteers. However, no fishers or households from the wider community have been involved in any enforcement activities. When asked whether the fishers would be willing to be involved in community-led enforcement, there was 100% agreement for this option. Suggestions for enforcement procedures included a warning system for first-time offences, subsequent fines and community-imposed fishing bans for any number of days that would reflect the severity of the offence. The fishers believed that a community imposed and publically enforced fishing ban would be a more effective enforcement tool and deterrent than the current top-down approach.

As a result of this lack of support for the current mode of enforcement of the rules and regulations, fishers believe many individuals break the rules (Individual Fishers Survey Question 10) (Figure 8). When asked why fishers break the rules given the severity of punishments, responses given were that the illegal gears and fishing effort in restricted grounds would bring the most economic benefit.

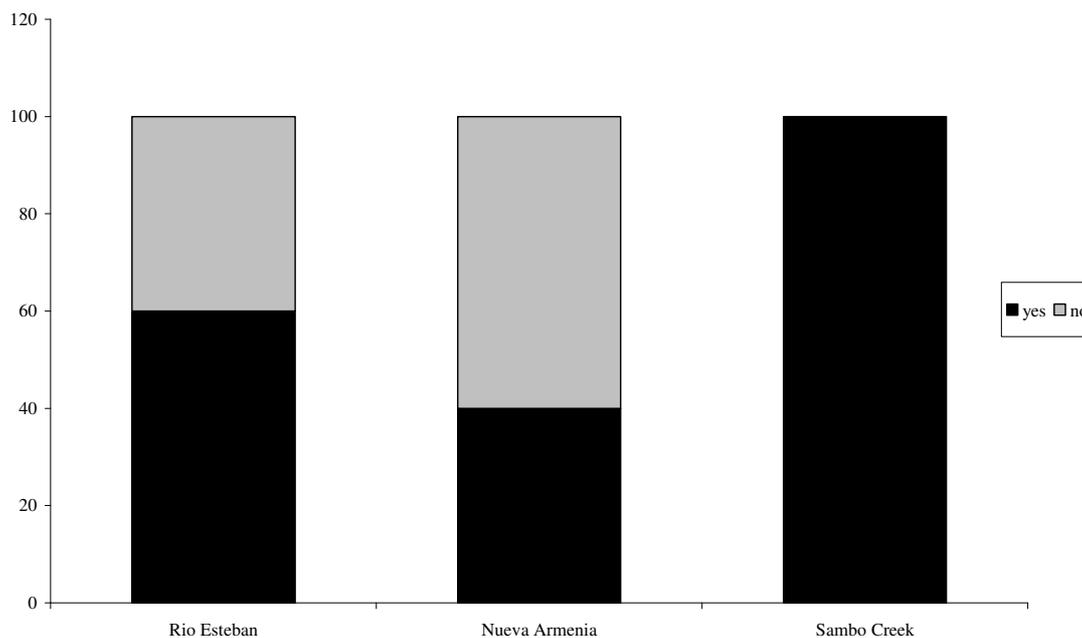


Figure 8: Proportion of respondents believing that many individual fishers break the rules of the CCMPA in focus group study sites.

The satisfaction of local fishers with the management of the CCMPA is an important assessment to determine the effectiveness of the management plan in achieving its management of fishing sub-program. Therefore, fishers were asked about the positive and negative effects of the management plan for their livelihoods and ability to make an income (Fishers focus group Question 41). Table 9 documents the combined responses from all focus group study sites, themed into ecological, social and economic categories. The table also highlights the discrepancy between the perceived number of positive and negative outcomes.

The positive effects of the management plan are mainly ecological benefits for species recovery and conservation that the fishers recognise as important for the long-term sustainability of fishing in the

CCMPA. An important positive outcome recognised by the fishers has also been the prohibition of industrial fishing boats from the protected area, although persistent illegal fishing by commercial trawlers was a complaint from the fishers.

The negative effects of the management plan are mainly social and economic considerations. The most frequently mentioned outcome was a loss of earnings as a result of the regulations, and with it a loss of fishing days at sea when filming the reality show. Coupled with loss of income from fishing, the fishers also reported an increased involvement in the drug trade passing through Honduran waters from Colombia. Although clandestine, this increasing involvement is creating notable social problems for these fishing communities. A loss of a sense of ownership over the marine resources was also a common negative outcome, resulting from a lack of involvement and communication with the HCRF as discussed under Project Objective 1.

Table 9: Positive and negative outcomes of the management plan for the CCMPA

Positive outcomes of the CCMPA	Negative outcomes of the CCMPA
Aware if protect the area will benefit them in the future	Loss of income
Prohibition on industrial fishing	Loss of fishing days as a result of Reality Show
Species protection (lobster, conch)	Lack of trust for HCRF because no communication
	Loss of sense of ownership
	Perceived change in natural food webs
	Increase in drug involvement

The positive and negative outcomes of the management plan are further emphasised when fishers were asked to state whether the abundance of species that are now prohibited or regulated under the management plan (ecological), the number of fishers remaining in the community (social), and the ability of the fishers to maintain an income (economic) have increased, decreased or stayed the same (Fishers Focus Group Question 33). Table 10 illustrates that all the fishers from Rio Esteban and Nueva Armenia are in agreement that the numbers of lobster and conch have increased since the introduction of management plan measures. The numbers of fishermen in both communities have decreased, along with an ability to make a consistent catch, income from the catch and future ability to make an income from fishing. Therefore, it is clear that although the management plan is having conceivable positive ecological benefits which will secure the long-term sustainability of fishing for these communities, it is having a negative overall social and economic effect for the fishers. Fishers in Sambo Creek did not answer this question.

Table 10: Perceptions of the effects of the management plan for the CCMPA on ecological, social and economic categories.

Community	Lobster	Conch	Reef fish	Number of fishermen	Consistent catch	Income	Future income
Rio Esteban	increased	increased	same	decreased	decreased	decreased	decreased
Nueva Armenia	increased	increased	decreased	decreased	decreased	decreased	decreased

5.2.2.2 Indicator: Existence and application of scientific research & input

The management of an MPA is dependent on the scientific information that is fed back to improve decisions. Therefore, the managing agency needs to be able to understand and access scientific information. Natural science information is vital to understand ecosystem functions and change, while social science is vital to identify anthropogenic influences on the system, and to assess the appropriateness of management solutions (Pomeroy *et al*, 2004). This information needs to be continually monitored and used to make improvements to the management of the MPA.

There is a considerable amount of scientific research being conducted within the CCMPA by Operation Wallacea, WWF Central America and projects commissioned by the TNC. Most of the research focuses on the coral reef ecology of the protected area, with some preliminary work looking at the abundance of target species of both commercial and artisanal fishing. Ecological monitoring is also completed as part of the regional monitoring program coordinated by the TNC Meso-American Reef Program which uses rapid assessment appraisal of indicator species to monitor the health of the reef

system. Reef Check also produces an annual appraisal of the region, looking at specific coral and invertebrate species to make its assessments. All of the information is made available to the HCRF (whose personnel are also involved with the monitoring process) and is used to make changes to the ecological objectives of the management plan. However, there is little coordination of research efforts between these organisations, and no centralised documentation of the research projects that have been completed, or are being undertaken, within the CCMPA.

A significant deficiency of the application of scientific research is the limited dissemination of the findings to the local communities. As a result, there is little stakeholder understanding of the activities of the HCRF, and of the information being used to make decisions on the regulations imposed upon the resource users. This lack of transparency has been further undermined by the filming of the reality show within the CCMPA, which is contrary to the conservation principles of the management plan.

There is little evidence of consistent social science research into the anthropogenic influences on the system and appropriate management solutions. Most of the social information is generated from the management plan meetings which allow the communities to voice their concerns for specific uses of the marine resources. However, this study will provide some socio-economic baseline information to monitor the effects of the CCMPA management plan for fishers and the wider community.

Information about community impact on the marine environment will promote better understanding of the perceptions of how local communities use this resource. There is also a significant need for community education of how traditional and modern materials and behaviours can affect the marine environment, as a means to promote environmental stewardship.

5.2.3 PROJECT OBJECTIVE 3: To estimate the impact of the management plan on employment and income for the local communities.

5.2.3.1 Indicator: Household income distribution by source

Principal sources of household income are important to understand stakeholder characteristics which explain how people use the resources available to them to make a living for themselves. This will enable an understanding of the impacts of management on local communities, and who is benefiting or being disadvantaged by regulations. Changes in sources of income may indicate positive or negative outcomes from the MPA, or may show exogenous changes influencing the community. This is also a measure of community dependency on resources which could influence management decisions and training programmes. The managing agency needs to ensure that communities have adequate means for livelihoods and incomes (Pomeroy *et al*, 2004).

The primary economic activities of these communities include fishing, agricultural farming, small-scale informal activities, tourism related activities and remittances from migrants in the United States (Household Survey Question 9) (Figures 9, 10, 11). Exact data on the proportion of each community that has migrated is not available, but remittances constitute a significant source of income for many of the families in all communities.

It is clear that fishing is still the principal income generating activity in Chachahuate (84%), and there are also fewer listed alternative activities given the lack of land and proximity to markets. A significant portion of income on Chachahuate comes from tourism-related activities (32%), providing meals and accommodation to Operation Wallacea students during the research season, and an increasing stream of visitors from the Bay Islands throughout the dry season. The majority of tourists for the CCMPA stop on Chachahuate for a duration of 1-3 hours, dining on traditional Garifuna food in the restaurant.

By contrast, the main economic activities in Rio Esteban and Nueva Armenia are from 'other' options, not traditional Garifuna activities. These are principally construction work along the coast as much of the land is being developed for tourism, and remittances from family members abroad. There is much less tourism in the mainland communities, with few visitors from the Bay Islands travelling to the coast. Nueva Armenia has the greatest number of visitors from Operation Wallacea during the research season, passing through the community as the gateway to the research station on Cayo Menor.

Both men and women are involved with farming activities in the coastal communities. It is an important supplementary income and subsistence food source for households. It is especially prevalent in fishing households where income activities are highly dependent on seasonal changes and daily weather patterns. Farming for yucca, plantain and corn are also highly traditional crops, providing the basis for the small-scale production of cassabe bread by the women in each community. Much of the small-scale informal activities are dominated by women and involve a diversity of food produce and cleaning services.

Therefore, the communities of the CCMPA are characterised by a high degree of household income multiplicity, displaying an interest in numerous supplementary activities but have not abandoned fishing altogether. Instead, fishing is no longer a dominant job, but represents a lifestyle and cultural identity of these communities. This is similar to the findings of McPherson (2006) which found that all fishers needed to diversify their efforts in order to make a viable living.

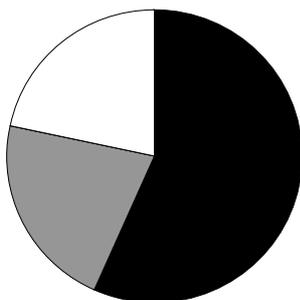


Figure 9: Household income generating activities in Chachahuate 2007

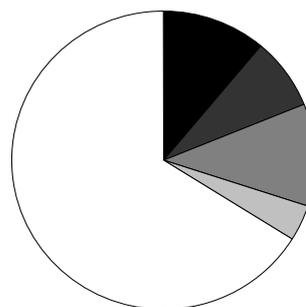


Figure 10: Household income generating activities in Rio Esteban 2007



Figure 11: Household income generating activities in Nueva Armenia 2007

Income activity key

Interestingly, when asked about job opportunities for both men and women in each community (Household Survey Question 14), the majority of respondents for each site gave fishing and agriculture as the main opportunities for men (Figure 12), and buying and selling fish as the main activity for women (Figure 13). Therefore, a strong cultural identify remains for traditional activities in these communities, even though there is considerable income diversity away from these activities.

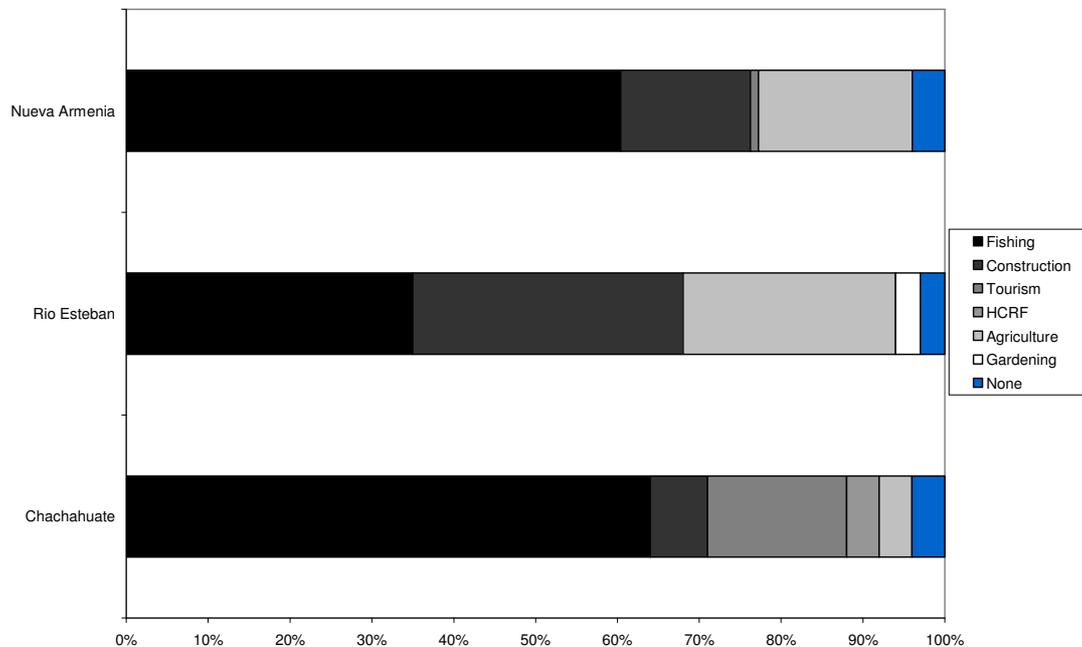


Figure 12: Job opportunities for men in each study site (%)

The opportunities listed for women in all three communities are much more tourism based than the opportunities for men. This is in agreement with McPherson (2006) where many of the micro-enterprises are dominated by women, running hotels and small restaurants, and other tourism services such as washing clothes.

Therefore, there is a much greater emphasis on women working in alternative livelihoods, principally tourism, in these communities. Fewer opportunities exist for men to diversity away from traditional activities. This is creating an imbalance of transitions between genders in these communities, which has the potential to reduce the sustainability of alternative livelihoods that are focused on tourism.

There has been some training of locals in tourism related activities and motor repair as alternative livelihood strategies, funded by the National Vocational Training Institute (INFOP) in 2006. However, of the twenty people trained from Chachahuate, Rio Esteban, Nueva Armenia and East End, none are working in tourism because they do not have the financial resources or the initiative to start tourism activities (Cubas, *pers comm.*).

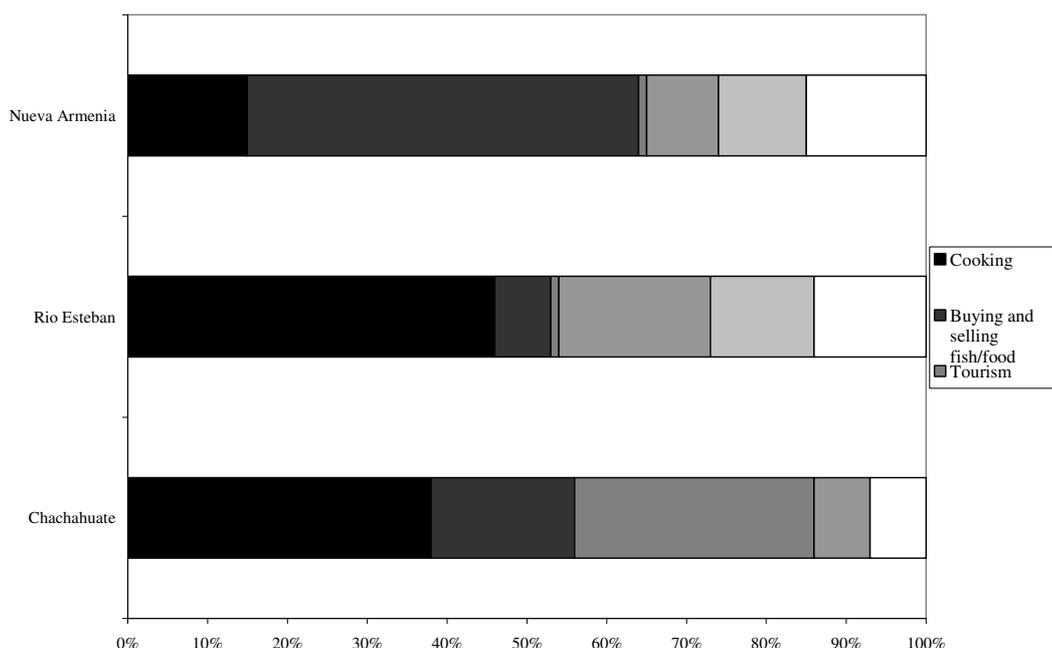


Figure 13: Job opportunities for women in each study site (%)

It was found that asking for household economic information was very difficult in these communities because no records are kept of income derived from any activities. It was also difficult for respondents to estimate proportional incomes for different activities because it is not a consistent amount per month. Therefore, monthly income is inferred from estimated monthly expenditures (Household Survey Question 12). Table 11 illustrates that the highest expenditure occurs in Chachahuate, where there is a higher cost for food and fuel being transported from the mainland out to the Cay. The expenditures for Rio Esteban are lower than the other communities. There are also considerable transport costs for food and fuel because this community is the furthest site from a main town, but it is also the location with the least tourism. Therefore, it can be inferred that Chachahuate makes proportionally more money from the increased level of tourism compared to the coastal communities.

Table 11: Average monthly and annual expenditure per household for each study site.

	Honduran lempira/month	US \$/month	Honduran lempira/annum	US \$/annum
Chachahuate	4502.1	240.76	54025.2	2809.13
Rio Esteban	3235.55	173.2	38826.6	2076.35
Nueva Armenia	3846.87	205.72	46162.44	2468.65
Total average	3712.41	196.53	44548.92	2358.33

In order to assess the impact of the management plan on the ability of local communities to generate an income from traditional activities and alternatives, it is necessary to look at any changes in income generating activities since its implementation (Household Survey Question 11). The most significant proportions of all households are reliant on the same activities for income in 2007 as they were in 2002 (Figure 14). There is some diversification away from fishing and farming, primarily because of changes to the climate, that have made conditions more difficult to make a sustainable income from both activities. Chachahuate has had the most change in the structure of income activities, with far fewer households engaged in informal activities (21%) (cooking, pulperias) or reliant on remittances (26%). This proportional change is directly related to the level of tourism related activities in 2007.

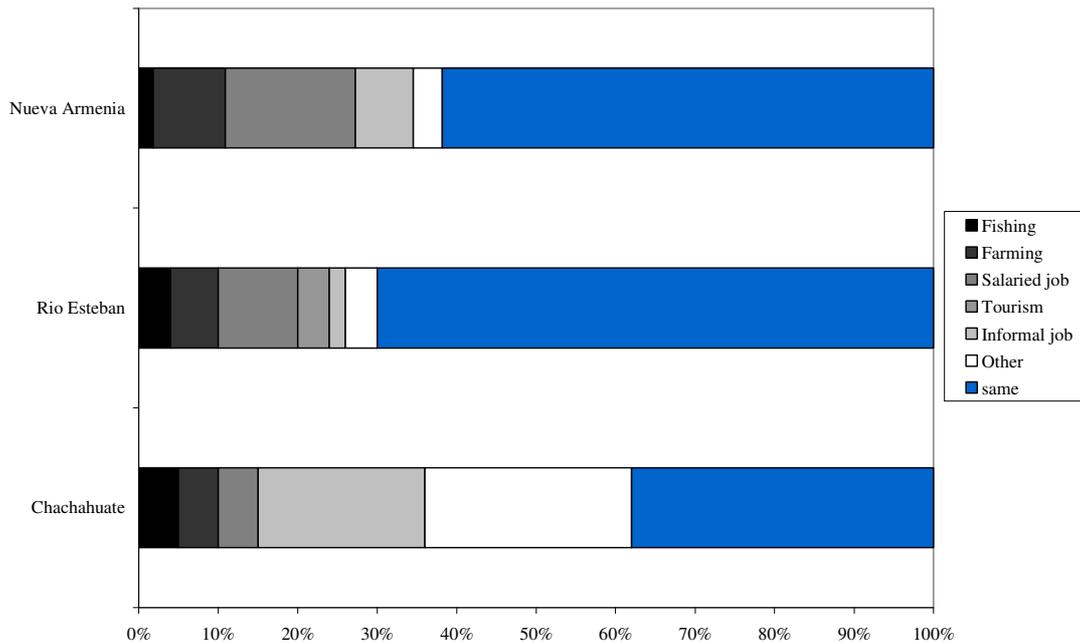


Figure 14: Proportion of income generating activities changes over the last five years for each study site.

It is also necessary to assess the impact that the management plan of the CCMPA has had on fishers in the local communities as the primary user group of the marine resources. This would highlight any positive or detrimental effects of the management plan. Fishers are principally small-scale artisanal fishers using two-man cayucos (canoes) with sails to navigate to fishing grounds. The fishers have traditionally targeted either finfish or shellfish, working as individuals or within cooperatives. With the implementation of the first five year management plan in 2004, licenses were introduced for all fishers of the CCMPA from local communities. This was to allow exclusive user rights to local fishers and the exclusion of occasional users from La Ceiba or the Bay Islands. Licenses from the HCRF are dependent upon an artisanal fishing license from the relevant Municipality through DIGEPESCA, the government agency with responsibility for all fishing activities in Honduras. Therefore, the list of fishers using the CCMPA from local communities should be the same as the governmental record. However, the HCRF license is also based upon a recommendation from the Patronato in each community, which identifies more fishers in cooperatives than individuals. Therefore, there is not sufficient recognition of individual fishers that are reliant on fishing as an income generating activity to gain an HCRF license.



Photograph 11: Cayuco with sail (Source: Oficina de Turismo)

A census completed in 2002, during the initial meetings concerning the first management plan, identified a total of only 224 fishers for all five communities of the CCMPA. 106 were identified in Chachahuate and Nueva Armenia, 70 in Rio Esteban and East End, and a further 39 in Sambo Creek (McPherson, 2006). This census was based on the fishers registered with licenses from the HCRF, and does not account for the number of individual fishers using the resources as one of multiple activities. However, all of the individual fishers interviewed in both Nueva Armenia and Sambo Creek indicated that fishing was the most important income activity for their household (Individual Fishers' Survey Question 7) (Figure 15).

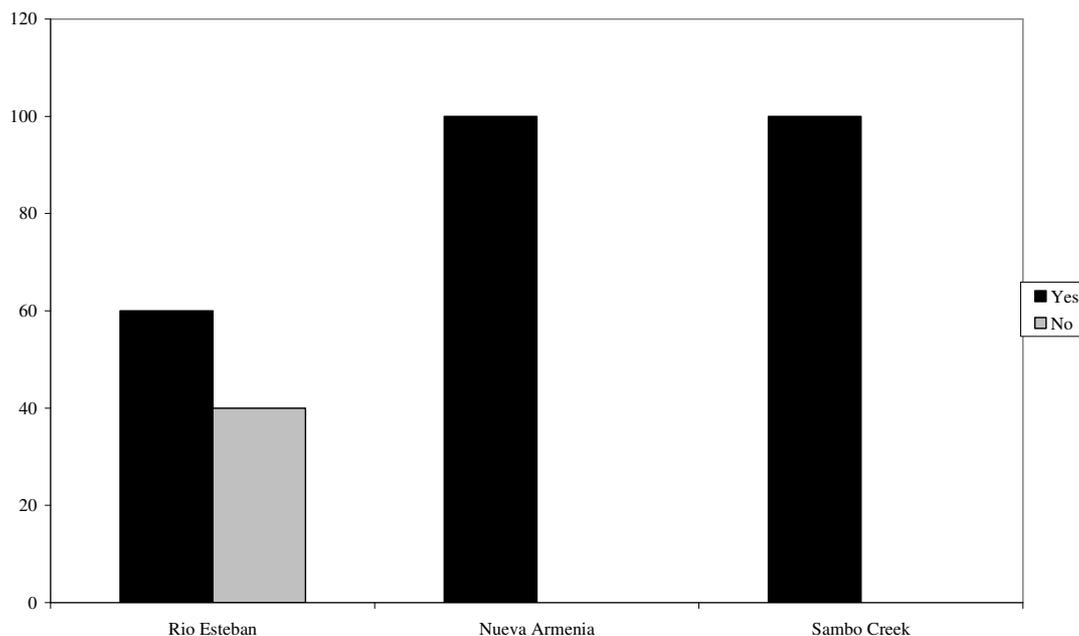


Figure 15: Proportion of individual fishers from focus group study sites listing fishing as their main income activity.

The same fishers are also dependent on other sources of income outside of the fishing season (Table 12). The majority were involved in tourism related activities and agriculture (except Sambo Creek), using their fishing boats to transport tourists out to the Cayos Cochinos. However, tourism boat trips requires a different, more expensive, license from DIGEPESCA which can only be afforded by fishers in cooperatives, otherwise many of these trips operate without the legal license.

Table 12: Other income generating activities for fishers in focus group study sites.

	Tourism	Agriculture	Construction	
RE	Yes	yes	yes	in May-August when bad fishing
NA	yes	yes	no	in May-August when bad fishing
SC	yes	no	no	

5.3.3.2 Indicator: Household occupational structure

This indicator measures the distribution of productive activities across households in the community. It compiles income generating activities and number of people working per household to measure the relative importance of different activities. It can be used to determine the percentage of households that are dependent on marine resources, and the level of diversification and change in occupational structure in each community.

The majority of households in each community are engaged in two or more income generating activities (Household Survey Question 9). Chachahuate has the greatest proportion of households dependent on two or more incomes, relying most heavily upon tourism as a supplementary activity. The coastal communities have fewer households engaged in multiple activities, relying on construction and remittances as the principal sources of income (Figure 16). However, there is much informal activity in these communities. The households with more than one source of income also had more than one wage earner, with the oldest females often engaged in informal activities that were not reported as income generating activities.

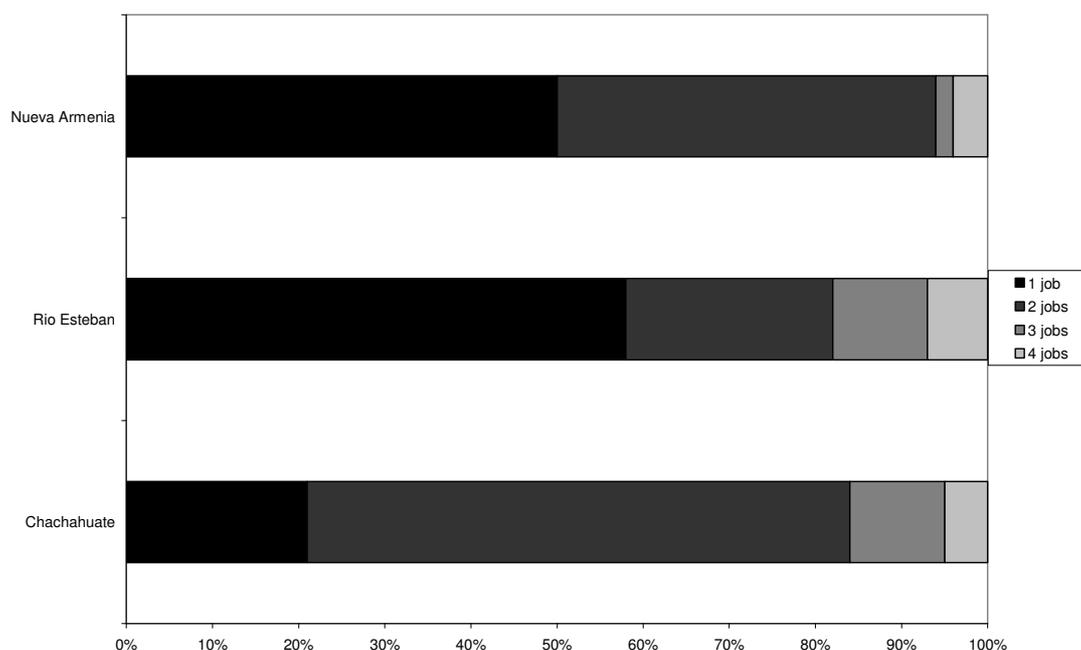


Figure 16: Average household employment multiplicity in each study site

5.2.3.3 Indicator: Community infrastructure and businesses

This indicator is a general measure of local community and economic development. It is based on a description of the level of community services (hospitals, schools) and infrastructure (roads, water) which contain information on potential sources of anthropogenic impacts on coastal resources. It also provides information on the commercial services associated with the MPA, or as a result of exogenous economic development (Pomeroy *et al*, 2004).

As stated in the management plan, the HCRF aimed to assess the potential for developing alternative sustainable incomes for the local communities who currently benefit from living inside or around the CCMPA, and also to assist in the application for funding to support community development projects. Therefore, the tourism-related developments in each community and associated donor sources were compiled alongside services and infrastructure to assess the alternative incomes resulting from the HCRF (Table 13).

Table 13: List of service, infrastructure and tourism developments for local communities of CCMPA.

Community	Services	Infrastructure	Tourism related developments	Associated donor agency
Chachahuata	None	Latrines Water tanks	Cabanas Restaurant	GAD US AID WWF CA
Rio Esteban	School Health centre Community hall Church Football pitch Basketball court Internet café Agricultural proj Reforestation proj	Dirt road Freeway to be built 2008 Electricity Water Public buses	Cabanas Restaurant Hotel	WWF CA TNC GAD US AID
Nueva Armenia	2 schools Health centre Community hall Church Football pitch Pool hall	Dirt road Electricity Water Public buses	3 restaurants 2 hotels	GAD US AID TNC WWF CA
Sambo Creek	School Health centre	Dirt road Electricity	2 hotels 3 restaurants	US AID WWF CA

	Community hall Church Football pitch Internet café	Water Public buses	Zip-line facility Artisan products	TNC
East End	Primary school	Water collection system Septic system	2 luxury cabanas Dock and restaurant Boa Centre	GAD TNC The Humane Society

There are a considerable number of commercial developments in each community, but it is not possible from this information to discern which developments have resulted from association with the HCRF. The HCRF (via Adoni Cubas) is involved with TNC, WWF Central America and GAD through its association with Tony Ives, although the extent of involvement with the funding applications for these developments is not clear. However, there have been tourism developments in every community since the implementation of the management plan in 2004. These developments outwardly benefit the economic growth of the communities, but there is uneven internal distribution of wealth between community members, reflecting power hierarchies within each community. This has not been assessed in the scope of this report and will not be discussed in further detail.

The proportion of each community that benefit from tourism-related developments was assessed in the household survey (Question 51). Figure 17 shows that 42% of respondents from Chachahuate believed that the whole community benefits from tourism. In Nueva Armenia, 61% of respondents thought that over half of the community did receive some benefit from tourism developments. In contrast, in Rio Esteban, over half of the respondents believed that less than twenty percent of the community received any benefits from tourism (57%). These responses reflect the levels of tourism in each community: Chachahuate has the highest level of tourism, and Rio Esteban the least. Nueva Armenia has a fairly wide distribution of tourism benefits because home-stays for Operation Wallacea researchers are spread throughout the community via the tourism group.

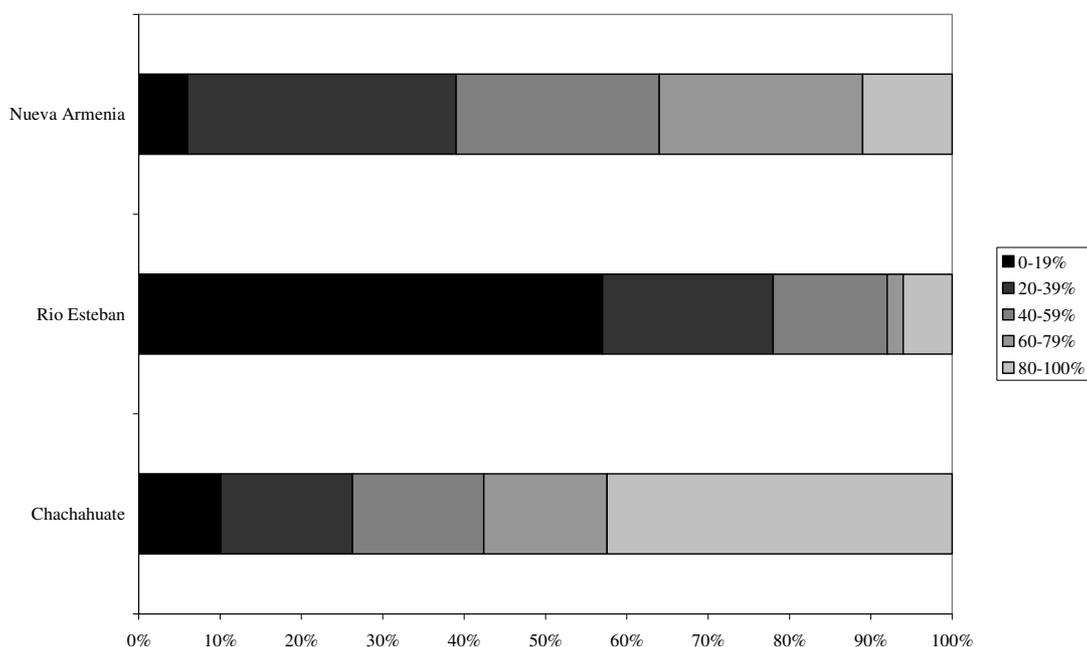


Figure 17: Percentage of each community perceived to benefit from tourism developments in each study site.

To assess the support of commercial developments in the communities, respondents of the household survey were asked if they would like to see more developments in the communities, and if so what they would support (Household Survey Question 54). Almost 100% of all respondents were in favour of more developments in their community. In Rio Esteban and Nueva Armenia, tourism related developments were the most frequently mentioned category (36%; 65%). However, in Chachahuate, the community with the highest current level of tourism (requested from the HCRF), further tourism developments was the least mentioned category (9%). Basic services including electricity (24%), water (18%) and educational facilities (15%) were much greater priorities for this community.

5.2.3.4 PROJECT OBJECTIVE 4: To consider the effects of the management plan on the social cohesion of the local communities.

5.2.3.4.1 Indicator: Level of resource conflict

This indicator is a measure of the nature and characteristics of conflicts that are associated with the resources of the MPA, and its management and decision-making strategy. A conflict in this indicator is taken to mean any type of conflict of ideas or interests. These conflicts are usually rooted in cultural, social, economic and political context unique to the area, and are unavoidable where regulations are imposed upon user groups (Pomeroy *et al.*, 2004). It is important to be aware of any increase or decrease of conflicts associated with the MPA over the duration of its management to be able to adapt management decisions for mitigation.

Interviews with key informants and fishers' focus groups revealed that conflicts do occur between fishers from the different communities since the implementation of the management plan. The greatest source of conflict was in Rio Esteban, where fishers feel disadvantaged because they are not eligible for MODAPESCA funding and receive little support from the HCRF. It was suggested that there are both internal conflicts between individual fishers and cooperatives, and between different cooperatives that have resulted in a greater sense of intra-community competition.

This element of competition also has inter-community implications over fishing grounds and rights of access to areas adjacent to each community. Following the regulations over fishing grounds and gear, traditional community grounds used primarily by a specific community are no longer accessible: the whole area of the CCMPA has become the target fishing ground for all communities. Therefore, fishers do not tend to cooperate outside of their own community unless uniting against a common cause, i.e., the filming of *Survivor*. There is also little communication between Patronato of the different communities on any issues. There is also some speculation from the HCRF that the communities do not work well together because they are descended from different African tribes, and that fishing is a solitary profession where working alone 'is part of the culture' (Cubas, *pers comm.*).

Respondents were asked if there were any issues within each community that were raising concern during the time of the field season (Household Survey Question 38) (Figure 18). The issues of concern in Chachahuate were focused on tourism and the supply of basic services to the community. In Rio Esteban, the major issue in the community was for a bridge connecting it to Trujillo and the main road into La Ceiba to be built. This issue has since been alleviated with the agreement by the Municipality of Colon to erect a bridge in 2008. In Nueva Armenia, there were no issues dominating the concerns of the households interviewed. Tourism, water supplies, transport and fishing were all given equal status as issues affecting the community. None of the issues were sources of conflict within or between communities. There is some conflict with the HCRF over fishing rights and access to grounds, but these are not community wide conflicts.

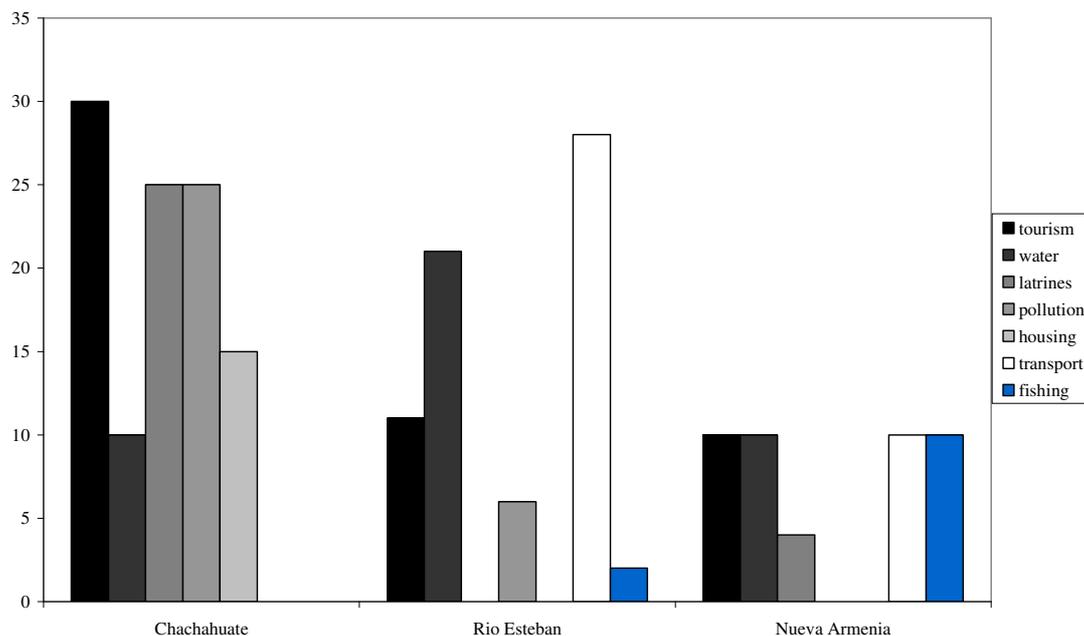


Figure 18: Categories of issues discussed in each study site (exact frequency).

5.2.3.5 PROJECT OBJECTIVE 5: To evaluate whether knowledge of factors affecting health of marine resources has increased as a result of the management plan.

Two indicators that are closely related are assessed together to evaluate the local community knowledge of marine resources and factors affecting the health of the ecosystem.

1. Level of understanding of human impacts on marine resources.
2. Perceptions of local resource harvest.

5.2.3.5.1 Indicator: Level of understanding of human impacts on marine resources

The level of understanding about human impacts on marine resources is a measure of the degree that local stakeholders understand ecological relationships and the impacts that human activities have on the natural environment (Pomeroy *et al*, 2004). It is important to have some understanding of perceptions of factors that can affect the health of marine resources to design responses that would facilitate better resource exploitation patterns, and help to develop community wide environmental education programmes.

To relate an activity to the marine resources of the CCMPA, respondents of the household survey were asked what might affect the numbers of fish in the sea to assess their understanding of the impact of different activities on the marine environment, i.e., the health of the reef (Household Survey Question 28). Answers were categorised as fishing (artisanal and commercial activity), human impacts (development, pollution, sedimentation, deforestation), environment (climatic changes), ecology (changes in fish behaviour, currents), and social/cultural (religious beliefs, traditional management). Respondents who did not suggest anything were also grouped as an indicator of the proportion of households with limited knowledge of marine resources.

Figure 19 illustrates that fishing and fishery related activities (bait digging, commercial trawling) was the most frequently given answer from the two coastal communities (Nueva Armenia, 47%; Rio Esteban, 52%), whereas human related impacts was the most frequent response from Chachahuate (36%). This observation supports the research by Shrives and Cowie (2007) which found evidence of terrestrial pollution from both Cayo Mayor and Cayo Menor which is degrading the quality of the reefs adjacent to these islands. The largest group of respondents without any ideas for what might affect the numbers of fish in the sea were from Nueva Armenia and Rio Esteban, the two coastal communities. This suggests that there is some need for environmental awareness in these communities about the marine resources.

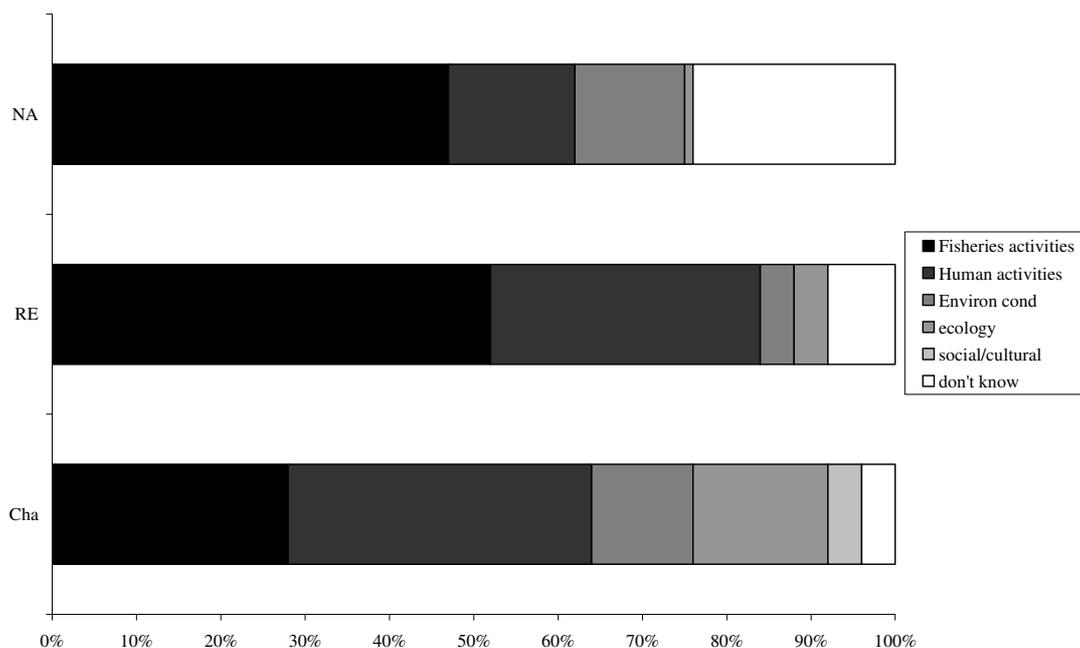


Figure 19: Categorical responses for factors that can affect the number of fish in the sea for each study site

5.2.3.5.2 Indicator: Perceptions of local resource harvest

This is a measure specifically directed towards the local fishers to understand perceptions about the availability of target species. Fishers' knowledge will help to determine if the MPA is achieving management plan objectives for increasing the abundance of target fish species, and the effectiveness of regulations and management decisions to conserve stocks. If perceptions are positive, there should be greater support and compliance for the MPA. If the perceptions are negative, compliance is likely to be low and changes in management would be necessary (Pomeroy *et al.*, 2004). The indicator can also be used in conjunction with fisheries data of stock abundance, size and catch composition.

All Garifuna communities eat large quantities of fish as part of their diet. Therefore, traditionally these communities have some idea about the levels of fish caught locally, and the impact this has on the marine environment. Fish makes up 70-80% of the diet of all three communities (Household Survey Question 18), and of the fish consumed, over 90% is caught locally inside the CCMPA (Household Survey Question 19). However, since the introduction of the management regulations for fishing in the CCMPA, over 80% of respondents in each community perceive that the prices of locally caught fish (red fish, white fish, shellfish) have increased (Household Survey Question 20). At the same time, over 70% of respondents in Chachahuate, and over 85% of respondents in both Rio Esteban and Nueva Armenia believe that supplies of locally caught fish have decreased (as a combination of both fishing effort and fish abundance). Figure 20 illustrates the perceptions of change in the numbers of shellfish and reef fish in the CCMPA since the introduction of the management plan (as a measure of abundance not food availability). Overall, all three study sites believe that the numbers of shellfish (lobster and conch) have decreased within the last five years. The number of reef fish is believed to have decreased within the last five years in the two coastal communities, though respondents in the cayen community of Chachahuate believe that numbers have increased. Therefore, there is some evidence to suggest that the management regulations for gear restrictions and closed areas may be having a positive effect for reef fish species.

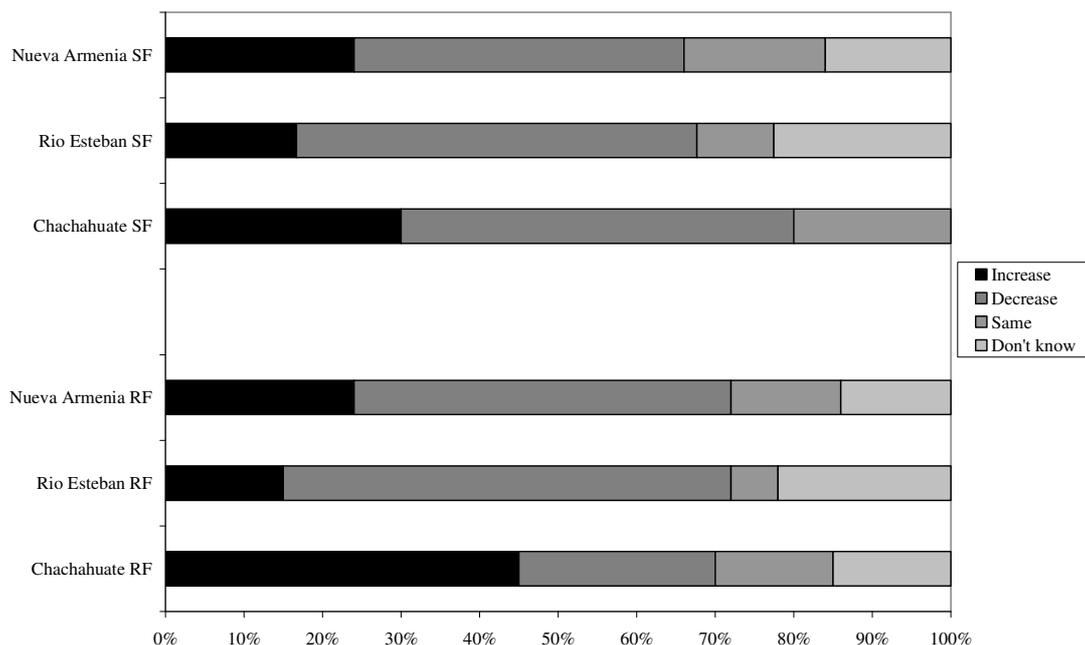


Figure 20: Perceptions of the change in number of shellfish (SF) and reef fish (RF) over the last five years for each study site.

Similarly, respondents were asked what they could do to increase the numbers of fish in the sea (Household Survey Question 31). These responses were grouped into recognisable management measures. The methods proposed to increase the numbers of fish differed in each community (Figure 21).

In Chachahuate, the most frequent response was for gear and equipment restrictions (30%) (nets, pots, diving), followed by a prohibition on all fishing (13%) equal with fishing further away from the CCMPA, i.e., outside of the MPA boundary (13%). This is contradictory to the results of the previous question where the majority of respondents on Chachahuate thought that human impacts were having the greatest effect on the abundance of fish. Therefore, there is a clear distinction between perceptions

of what can affect the numbers of fish where fishing is not immediately associated with the health of the reef, and perceptions of how to increase the number of fish which is more directly associated with fishing effort.

In Rio Esteban, where fishing was the main reason given for the negative impact on the number of fish in the sea, management measures to increase numbers were primarily fishing-related. Closed season and temporal restrictions were the most widely suggested response (26%), along with a prohibition on all fishing activity (16%) and landing size restrictions (10%). A large proportion of the respondents did not have any suggestions (16%).

The respondents in Nueva Armenia also suggested fishing related management measures to improve the numbers of fish in the sea. The most frequent suggestion was for closed seasons and temporal restrictions (19%), along with gear restrictions (14%) and landing size restrictions (14%). Nueva Armenia had the largest proportion of respondents that did not have any suggestions for this question (31%).

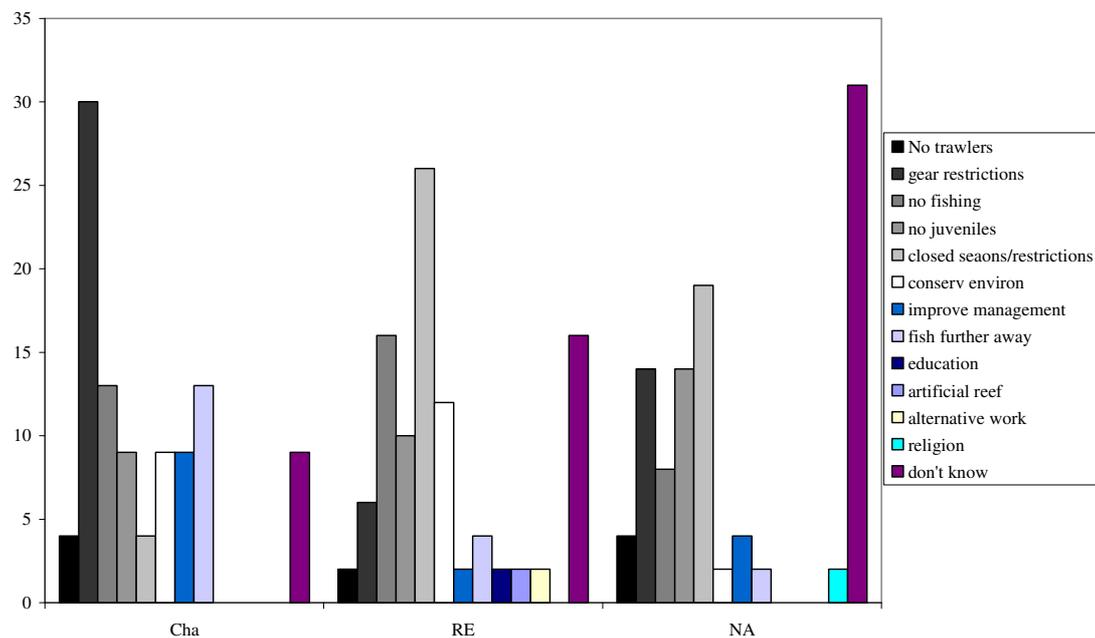


Figure 21: Suggestions for what could improve the number of fish in the sea for each study site.

5.2.3.5.3 Indicator: Stakeholder knowledge of natural history

Stakeholder knowledge is a measure of the knowledge held by locals that is not based on scientific research but is a result of stakeholder observations, experiences and beliefs. It is an indication of the sources of information and transfer of knowledge in the community about the natural environment (across generations, gender, roles). This information is important because those people with a higher knowledge of marine resources are more receptive to management processes (Pomeroy *et al*, 2004).

In addition to the results from the previous two indicators which provide evidence that fishers are the most knowledgeable members of the community about marine resources, household survey respondents were asked where they learned about the marine environment (Household Survey Question 30) (Figure 22). All three community responses suggested that family members and experience of the marine environment (other) were the main mechanisms through which they have learned about the marine environment. However, it is notable that the HCRF was given a low response in all the communities. This implies that the HCRF has not been fulfilling its educational aim as listed under Management Plan Objective 1.

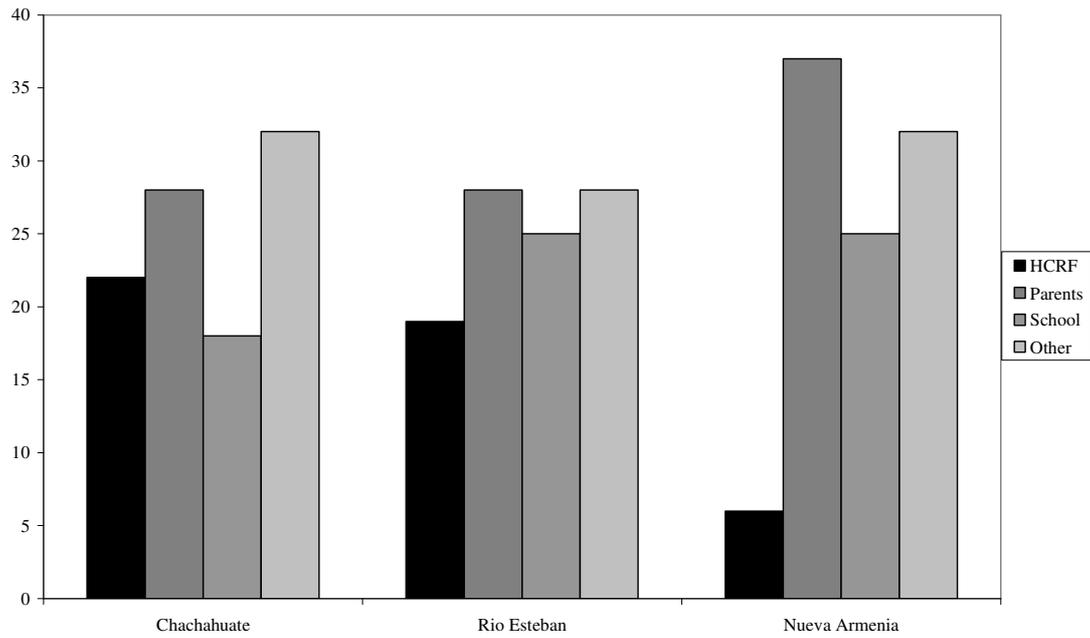


Figure 22: Information sources about the marine environment for each study site.

5.2.3.6 PROJECT OBJECTIVE 6: To investigate the suitability of existing governance and legal frameworks for successful implementation of the management plan

5.2.3.6.1 Indicator: Existence and adequacy of enabling legislation

The existence and adequacy of enabling legislation will provide a management plan with the legal framework that enables the goals and objectives to be recognised, enforced and accountable. The identification of this framework ensures that the management plan is successfully implemented, and where possible incorporates existing local traditional laws (Pomeroy *et al*, 2004).

The legislation to legalise the CCMPA is centralised in COHDEFOR, the government agency responsible for the management of all protected areas in Honduras. The management plan of any protected area in Honduras must also be internalised through COHDEFOR and subjected to scrutiny by the National Congress before it is formally accepted in order to ensure that it fulfils the international and national requirements. The accounts for each protected area and its managing agency are also supposed to be audited internally by personnel from COHDEFOR. This should ensure that all of the resources for conservation and administration efforts are accounted for correctly. Uniquely for the CCMPA, because it is entirely privately owned, the title deeds for the land of the CCMPA are subject to a conservation order which documents that the islands and associated marine resources must be conserved.

However, two situations undermine the governance capacity of COHDEFOR with respect to its overall responsibility of the management of the CCMPA.

1. The first management plan of the CCMPA was not internalised within COHDEFOR, instead it went straight to Congress where it was passed as a legally binding document.
2. Since a change of the political party holding power in the Honduran government in 2005, the number of internal auditing personnel involved in COHDEFOR has been reduced. Therefore, the majority of NGOs managing protected areas in Honduras (including the HCRF) do not have to provide evidence of their accounting of financial resources to the government.

The strength of the responsibility of COHDEFOR is further compromised by the political situation in Honduras. Changes of the dominant political party occur frequently, almost at every general election (five years), bringing with it re-structuring of government agency personnel. Therefore, knowledgeable staff members are moved into different job roles or removed completely until a subsequent change back to the previous party. This situation results in a frequent turnover of personnel, and a lack of consistency for implementation of regulations. This effect is further compounded by the change in political interests of the different parties. Currently, the Liberal Party of Honduras has a strong position for the protection of natural resources, declaring eleven further terrestrial and marine protected areas since 2005.

5.3 Summary of the Effectiveness of the CCMPA in achieving its stated social and governance objectives

Table 14: Summary of analysis of the effective achievements and areas for improvement of the objectives of the CCMPA management plan.

Management plan Objective	Achieved	Lacking
1. To provide means and opportunities for education of the ecological processes and cultural presence.	There is awareness of the management plan and ecological processes among fishers	There is a lack of knowledge of ecological processes or the management plan in the wider community
2. To conserve the genetic material that avoids loss of species in the MPA, specifically those of importance for fishing.	There is some evidence that conservation efforts for lobster and conch species is achieving success.	Lack of data for reef fish species, and fishing effort of all fishers in CCMPA catchment communities
3. To provide means and opportunities for recreation and low impact ecotourism in harmony with the natural and cultural characteristics of the MPA.	There are commercial tourism developments in all communities	Tourism is not spread evenly throughout each affected community
4. To allow normal customs and way of life of ethnic groups living within the MPA.	Traditional activities (fishing, agriculture, punta dancing) are still practiced in all of the communities	There are limitations on traditional fishing activities, and influences of cultural shift
5. To generate information to demonstrate the effects and impacts of the MPA to the ecological balance and its area of influence to sustain management decisions.	Sufficient and sustained research of the ecological health of the CCMPA	Limited dissemination of research to the communities
6. To develop connection mechanisms to incorporate local populations within the MPA and its area of influence to contribute towards sustainable development.	Some involvement with community groups for alternative livelihood developments	Limited socio-economic data for traditional and alternative livelihoods, limited interaction between managers and stakeholders

6. DISCUSSION AND RECOMMENDATIONS

The results presented in this field report support the hypothesis that although the management plan of the CCMPA is being effective in some objectives (mainly ecological and conservation), it has only weakly addressed the socio-economic objectives that have been designed to mitigate the effects of restrictions of resource use for the communities dependent on the CCMPA.

6.1 Project Objective 1

The main findings from the results concerning the awareness of the communities about the management plan for the CCMPA have highlighted that the wider community have low levels of awareness in each study site. There is also a lack of regular interaction between the HCRF and the local stakeholders, and a subsequent lack of information available to them concerning the management activities of the CCMPA. However, there is a strong interest from respondents to become involved in meetings about the management plan.

6.1.1 Recommendations

- The HCRF needs to direct more personnel and funding resources towards holding regular meetings with the wider community in each affected Garifuna settlement. This would provide a forum for greater interaction between managers and stakeholders, and an avenue for information dissemination to the wider community.

6.2 Project Objective 2

The main findings concerning the level of satisfaction and involvement with management decisions are that there is a severe lack of involvement from the communities in management plan meetings, and representation of views from individual fishers is low. The lack of information about the current research being conducted in the CCMPA and its implications for the regulations imposed on fishers has also created a lack of trust of the HCRF. This has been exacerbated further by the agreement between the HCRF and Magnolia to film the reality show 'Survivor' in the CCMPA. Top-down enforcement by the Honduran Navy has also created resentment among the fishers, who feel that the manifestation of enforcement is unfair and inappropriate.

6.2.1 Recommendations

- The HCRF should engage in community-led enforcement using fishers from each community to patrol the CCMPA, in conjunction with HCRF guards as stated in the sub-program strategy for fishing management.
- The HCRF should hold more frequent meetings with fishers and the wider community to inform of research findings, and to discuss suggestions and grievances made by the fishers about restrictions.
- Improvements in the transparency of HCRF activities. This includes transparency of the research conducted in the CCMPA to enable a better understanding of the implications that continual fishing pressure and human behaviour can have on the health of the coral ecosystem. More importantly, there is a need for transparency of the financial expenditures and gains of the HCRF from all activities, particularly the filming of 'Survivor' during the fishing season, and revenue generated from the tourist entrance fee.

6.3 Project Objective 3

There is a strong trend for income multiplicity in all the study sites of the CCMPA. There is a move away from traditional activities as the primary sources of income, towards tourism-related activities. However, alternative livelihoods are more available to women than men, and tourism development is not evenly distributed between all communities.

6.3.1 Recommendations

- The HCRF needs to offer more training in activities to diversify from fishing, specifically training men for micro-enterprises and tourism activities.
- The HCRF needs to ensure a fair and even distribution of alternative livelihood developments across all the CCMPA communities.

6.4 Project Objective 4

The results do not show conclusive evidence of resource conflicts in the CCMPA as a result of the management plan. However, there are intra- and inter- community conflicts between fishers as the primary users of the marine resources.

6.4.1 Recommendations

- The HCRF needs to work with the communities to organise fishing cooperatives and harmonious relations between the communities for fishing of traditional community grounds.

6.5 Project Objective 5

The results show that there is a low general knowledge of the marine environment in all communities, particularly coastal communities, demonstrating a lack of education of the local resources. Fishing was regarded as the most prevalent influence on the number of fish in the sea, with little evidence of awareness of human influences to the health of the ecosystem.

6.5.1 Recommendations

- The HCRF needs to improve education and awareness of the marine environment, and of the conservation efforts by the HCRF to protect marine resources for the benefit of the local communities. The HCRF needs to direct more personnel and funding resources towards the development of a regular and continual programme of environmental education.
- It is important to motivate the local communities to protect their marine environment so that community-based projects will be successful beyond the organisation of the HCRF.

6.6 Project Objective 6

The governance system of the protected areas in Honduras provides the legal and institutional framework for the implementation of the management plan for the CCMPA. However, there are weaknesses associated with the re-structuring of government agencies and personnel that do not enforce accountability of monetary resources from managing agencies.

6.6.1 Recommendations

- The HCRF needs to work more closely with COHDEFOR to present clear and accountable details of all financial activities in the CCMPA.

The results of this report focus on qualitative analysis of interviews and focus groups with members of the local communities affected by the CCMPA. Although these analyses are not statistically robust, from qualitative assessment the findings have a more significant impact because the collective responses are extremely similar both inter-community, and intra-community (households). Therefore, the information gathered during the 2007 field season that has informed this research is analytically robust.

The results can be further supported by the current situation in the Cayos Cochinos concerning the right to fish for fry around Cayo Paloma during specific days of filming for the reality show. Fishers from Chachahuatate have enlisted the help of OFRANEH, an organisation that represents the interests of the Garifuna, to contest the closure of bait collection areas of the CCMPA. In February 2008, a letter was sent to the HCRF detailing the unhappiness of the Garifuna fishers with the situation in the CCMPA. The letter illustrates two critical points that correspond with the findings of this research:

1. The Garifuna are deeply dissatisfied with the management of the marine resources of the CCMPA because they feel that there have been no tangible benefits or compensation given to the fishers for the loss of income resulting from the filming of the reality show. This illustrates that there has not been sufficient transparency of the financial gains from Magnolia paid to the HCRF for the use of the CCMPA. It also re-iterates the lack of trust for the HCRF to be representing the best interests of the Garifuna.

2. The sense of ownership is adversely affected by the introduction of a top-down approach to management on a system that has undergone a transformation from a CPR regime to a privatised user group. Don Buelto, a fisher from Chachahuatate commented that 'if global warming and sedimentation is killing the reefs anyway, how is stopping us fishing certain areas going to help the corals?' (translation by Shrikes, 2008). This quotation demonstrates that the sense of ownership of the marine resources of the CCMPA, and subsequent sense of protection, is no longer strong enough to support the regulations imposed by the management plan.

7. CONCLUSION

It is clear that there have been considerable efforts to involve and communicate understanding of the management plan to the fishers of the affected communities, and to initiate sources for alternative livelihoods to diversify dependency away from fishing activities. However, these efforts have not been equally distributed between communities, or to the members of each community as a whole. The fishers are particularly aware that the management plan is having positive ecological benefits for the conservation of target species. However, the short-term financial and social disadvantages have created a stronger sense of resentment and negativity for the management of the CCMPA. There is already an existing degree of household income multiplicity, providing a framework for the introduction of alternative supplementary sources of income rather than abandonment of traditional practices altogether. Therefore, efforts to promote tourism-related activities should work with existing skills and practices rather than introducing new methods of working. This would provide a more achievable and sustainable method to generate diversified livelihoods for the local communities.

In order for the socio-economic objectives of the management plan to become more effective and sustainable, promotion of alternative livelihoods and community wide participation in HCRF activities and management decisions needs to be fully adopted and sustained. This bottom-up participatory approach, a critical component for successful co-management, must allow for a greater involvement of the communities themselves to reflect traditional values and practices. This level of participation would promote a cultural shift in favour of environmental stewardship. Thus, over time, the wider communities of the CCMPA would care for the environment and feel ownership of the marine resources.

Following the findings discussed in this report, the research will continue to evaluate the effectiveness of the management plan, providing a base-line economic survey of the socio-economic effects of restricted resource use on the local communities of the CCMPA. Future research will also concentrate on the governance structure of the CCMPA, focusing on government agency involvement (COHDEFOR, DIGEPESCA), and inter-departmental relations between Colon, Atlantida and the Bay Islands. The management plan achievements will also be contextualised against other regional MPAs in the MBRS, as well as some comparisons with another NGO managed protected areas along the north coast of Honduras, Cuero y Salado. The effectiveness of the management plan will also be measured against the ability of a non-managed marine park to achieve conservation of marine resources for fishers in the Bay Islands (Utila).

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9. APPENDICES

9.1: Appendix A: Household Survey 2007

HOUSEHOLD SURVEYS

Household Number: _____

Date: _____

Village: _____

Interviewer: _____

Translator: _____

Introduction: Marine scientist/marine researcher from Newcastle University, studying management of MPAs, particularly interested in ones that already have management in place. Would like to ask some general questions about Garifuna life, covering jobs, group activities, knowledge of environmental resources, and will include some economic questions.

SECTION 1: DEMOGRAPHIC INFORMATION

1. Were you born here?

a. this community	b. this region	c. this country	d. other country
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2. How long have you lived here (this village/community)?

a. < 3 years	b. 3-10 years	c. 10-20 years	d. 20 + years
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2a. If moved here, why did you move to this community?

a. fishing	b. other work	c. family	d. health	e. other
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3. How many people live in your house?

a. adult male	b. adult female	c. child male	d. child female
---------------	-----------------	---------------	-----------------

(Explain that this question is to compare the types of housing here with other countries that have MPAs being studied, Seychelles, Fiji etc....)

4. Household items and facilities

a. Generator	b. Electricity	c. Modern stove	d. Vehicle
e. TV	f. Electric fan	g. Satellite	h. Piped water
i. Refrigerator	j. Radio/stereo	k. VCR	l. Water tank

5. Roof material

a. Thatch	b. Metal	c. Tile	d. Other
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6. Floor material

a. Cement	b. Tile	c. Wood	d. Dirt	e. Other
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7. Wall material

a. Cement	b. Coral	c. Wood	d. Metal	e. Other
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8. Toilet

a. Flush	b. Outhouse	c. Public	d. None	e. Other
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SECTION 2: HOUSEHOLD ECONOMICS

9. What is your occupation?

- a. Interviewee:
- b. How did you learn the skills:
- c. Occupation of others in household:
- d. Most Important:

ANSWER KEY

- A. Fishing B. Farming C. Mariculture D. cash crops E. salaried job
- F. Tourism G. Informal Job H. other

DON'T ASK THESE

- 9f. Total number of earners in household?
- 9g. Total number of different occupations?

10. Do you keep the different sources of income separate?

- a. Yes
- b. No

11. What other work have you done in the last 5 years?

a. Occupation	b. Was this your main source of income?	c. If not doing this now, when did you last do it?	d. Could you get started now?	e. Job preference?

12. How much money do you spend monthly? (Including food, transportation, clothing, rent special occasions, fishing equipment etc.)

12.a. what do you spend the most money on?

13. Who makes the decisions on what money is spent on?

a. Husband	b. Wife	c. Other
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14. What job opportunities are there to generate income in the community?

a. Men	b. Women

15. How would you describe the division of labour/responsibilities in the household?

a. I do more	b. Husband does more	c. Wife does more	d. Equal
--------------	----------------------	-------------------	----------

16. Are you happy with this division?

a. Unhappy	b. Lots more help	c. Some help	d. Happy
------------	-------------------	--------------	----------

17. Is this division of responsibilities in the community the same as your household?

a. Yes	b. No What way are they different?
--------	---------------------------------------

18. What foods are typically eaten in this community?

19.A. Are the fish and shellfish you eat caught locally? B. Who do you buy it from and where do you buy it?

a. Yes	b. No
c. Where from?	

20. Has the price of fish changed much in the last 5 years? *Significant event?*

a. Increased	b. Decreased	c. Stayed the Same
--------------	--------------	--------------------

21. Have supplies of locally caught fish changed in the last 5 years? Why do you think this is?

a. Increased	b. Decreased	c. Stayed the Same
--------------	--------------	--------------------

22. What traditions are associated with being Garifuna?

23. Are any of these traditions being lost?

24. Would you be willing to use these traditions for tourism?

25. How do you think these traditions be preserved for the future?

SECTION 3: PERCEPTIONS ABOUT COASTAL RESOURCES

26. Has there been a change in the number of reef fish in the sea now compared to 5 years ago? (5 years because start of consultation period for phase 1 of management plan)

a. Positive	b. Negative	c. Same	d. Don't know
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27. Has there been a change in the number of shellfish (lobster, conch) in the sea now compared to 5 years ago?

a. Positive	b. Negative	c. Same	d. Don't know
-------------	-------------	---------	---------------

28. What would you do to increase the numbers of fish in the sea? (management recommendations)

29. How are the Cayos and the Bay Islands different? If so, how?

Cayos Cochinos	Bay Islands

30. Where did you learn about the local environment?

a. HCRF	b. Parents	c. School	d. Other
---------	------------	-----------	----------

31a. What can affect the numbers of fish in the sea? 33b. How?

SECTION 4: FIRST STAGE OF MANAGEMENT PLAN – EFFECTIVENESS OF MANAGEMENT (FEEDBACK)

32. Are there any groups that you know of here?

a. Yes	b. No	c. Describe

33. Do you belong to any of these groups?

a. Yes	b. No	c. How many
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34. How are decisions made?

35. How do you become aware of these decisions?

36. When decisions are made here, are you involved in that decision?

a. Yes	b. No	c. Passive	d. Active
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37. Are there any regular meetings to update everyone about what is going on in the village?

a. Yes	b. No
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C. How many?

D. Please describe:

38. What issues are being talked about most at the moment in the village?

39. Are you aware of any management processes/plans for the marine resources of the CCMPA?

a. Yes	b. No
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40. If there was a meeting to be held about the management plan in the village, who would you expect to be there?

a. You	b. Head of Patronat	c. Members of the F	d. Fishermen	e. Everybody
--------	---------------------	---------------------	--------------	--------------

41. Have there been any changes in the village in the last 5 years?

a. Social (culture, tourism etc...) <i>(Mention of TV programmes?)</i>	b. Economic (tourism, change in l etc...)	c. Environmental (fish stocks, agr etc...)

42. What would you like to see happening in the community?

SECTION 5: SECOND STAGE OF MANAGEMENT PLAN - WILLINGNESS TO PARTICIPATE
(Be aware these answers might just be to please the interviewer)

43. Would you like to be involved in meetings and discussions about the CCMPA and management plan?

A. Yes	B. No	iii. Don't know
Bi. Lack of time	Bii Lack of interest	Biii Feel unable to contri
		Biv. Other

44. Are you happy with the representation/representatives for the wider community on issues concerning marine resources?

a. Yes	b. No	c. Don't know	Who is it?
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45. Are you involved with any monitoring of marine resources with the HCRF?

a. Yes	b. No
--------	-------

46. Would you like to be involved with any monitoring? Why/why not?

a. Yes	b. No
--------	-------

SECTION 6 - TOURISM

47. What is the current level of tourism development within your village?

a. none	b. very little	c. some	d. lots
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48. What tourism facilities exist in the community?

a. What?	b. Who built it?	c. When was it built?	d. Who funded it?	e. Did the donor app

49. a. Do you provide home stays for tourist? A. Yes B. No
 (if yes) b. how many?
 (if no) c. are you willing to?
 d. could you provide more homestays if necessary?

50. Do you have a lot of interaction with tourists?

a. Yes	b. No
--------	-------

a. 0-19%	b. 20-39%	c. 40-59%	d. 60-79%	e. 80-100%
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51. What percent of the population would you say directly benefits from tourism?

52. Would you be willing to create partnerships with any of the following:

a. Within comm.	b. Other communiti	c. HCRF	d. NGOs	e. Other
-----------------	--------------------	---------	---------	----------

53. What impacts has tourism had in to your village?

a. Environmental		b. Social		c. Economic	
+ ve	- ve	+ ve	- ve	+ ve	- ve

54. Would you like to see more developments in the future?

a. Yes	b. No
--------	-------

55. If so, what?

56. My standard of living improved since tourism has become established within my village

- a. AGREE b. SLIGHTLY AGREE c. NO OPINION d. SLIGHTLY DISAGREE e. DISAGREE

57. Commercial activities such as scuba diving should be allowed

- a. AGREE b. SLIGHTLY AGREE c. NO OPINION d. SLIGHTLY DISAGREE e. DISAGREE

58. The economic gains of tourism are more important than any potential environmental loss

- a. AGREE b. SLIGHTLY AGREE c. NO OPINION d. SLIGHTLY DISAGREE e. DISAGREE

59. I would like to meet tourists from as many countries as possible to learn about their culture

- a. AGREE b. SLIGHTLY AGREE c. NO OPINION d. SLIGHTLY DISAGREE e. DISAGREE

60. The cultural identity of the village is more important than the economic gains of tourism

- a. AGREE b. SLIGHTLY AGREE c. NO OPINION d. SLIGHTLY DISAGREE e. DISAGREE

61. Would you be interested in being employed by tourism, if the necessary training was provided?

a. Yes	b. No
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62. Is the opportunity to be involved in tourism readily available for men/women/both?

a. Men	b. Women	c. Both
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63. Have there been any false promises for tourism related developments that have not been finished?

a. Yes	b. What was it?	c. No

64. Do you have any suggestions for how we can improve this survey?

65. When is the best time of day/day to interview people?

66. Age _____	67. Sex _____	68. Religion _____
69. Languages _____	70. Ethnicity _____	
71. Education _____ (equivalent in years _____)		

THANKYOU FOR YOUR HELP AND TIME WITH THIS SURVEY

9.2: Appendix B: Fishers Focus Group 2007

FISHERS SURVEY

SECTION 2: FISHERY INFORMATION

Could you draw a map of the fishing grounds, and mark where you fish, when you fish there (which season), what gear you use when you fish there, which species you fish for, the distance travelled for scale of the map, any particular features you look for to navigate there, what boat you use, if you fish alone, time of day you fish etc....Use HCRF map, use acetates.

Fishing now:

- Where do you fish? Fishing grounds (inside and outside CCMPA)
- Times of year fished?
- Which species are found in each area?
- SASs for each species?
- Which species are commercially important to you?
- What gear is used for each species?
- Distances to fishing grounds? Time taken to get to each ground? Fuel used to get to each ground? Most frequented grounds?
- Navigational features used to get to each ground?
- Time of day you fish there?
- Habitat types of each ground?
- Different groups of fishermen? Different target species/gears of each group? How long been in a cooperative?
- Extra equipment being used? Ie, FAD, sonar? If so, where did you get it from?

Fishing 5 years ago:

- Fishing grounds?
- Times fished?
- Target species?
- Gears?
- Distances travelled? Time taken to get to each ground? Fuel to get to each ground? Most frequented grounds?
- Habitat types of each ground?
- Same groups of fishermen?
- Same target species – abundance, size, location changes?
- If different, why are there changes?

SECTION 3: CATCH PER UNIT EFFORT PERCEPTIONS

17. How much do you catch on an average day/trip? (note which gears used) How long is an average trip?

Gear	Target species	Non target species	Amount (kg/boxes/local units)

18. How much effort (gear and time) do you put into a fishing trip? (hours, number of traps, number of lines)

Gear (number of lines/traps)	Hours/trip	Average effort/week (work this out later)

19. How much is the catch worth on an average day? (species)

Catch species	Value	Where sold/who sold to

20. On an average day, how much of the fish you catch is consumed and how many sold?

% kept for own use/consumed	% sold

21. Where is the catch sold? How is this catch sold? (i.e., middleman?) Has this changed over the last 5 years? If yes, how?

a. Where sold?	b. How sold? (individual, cooperative, middleman)	c. Changed since 2004?	d. How changed?

23. What was the value of the same catch 5 years ago?

Catch species	Value	Where sold/who sold to

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24. If the catch is different, why different now to 5 years ago? Please rank importance

a. Less fish	b. Restrictions	c. Fuel costs	d. Gear changes	e. More fishermen
f. Change in daily effort	g. Change in fishing areas	h. Other		

25. Have you altered the way in which you fish to try and catch more fish over the last 5 years? If so, how? (gear change, effort, because of restrictions etc...)

a. Yes	b. No	c. How

26. Have you ever been asked to keep any kind of record of your catch?

a. Yes	b. No
c. Who for?	

27. Do you keep a personal log book/record of what you've caught, where you caught it, how much you sold it for?

a. Yes	b. No
--------	-------

Format:

33. Since the management plan was introduced (2004) have you seen an increase in the number of lobster/conch/fish in the MPA?

	i. Increased	ii. Decreased	iii. Same
33a. Lobster			
33b. Conch			
33c. Reef Fish			
33d. Number of fishermen			
33e. consistent catch			
33f. ability to create an income			

ARTIFICIAL REEFS

34. Do you know what an artificial reef is? Please explain what you think it is.

a. Yes	b. No
--------	-------

Explain:

37. How did you learn about artificial reefs?

Which species do you think need conserving?

Where would you put an artificial reef to conserve:

- Reef fish?
- Lobster?
- Conch?

41. Have there been any outcomes of the MPA for you as a fisher? Please rank in order of importance (stopped commercial activity, recovery of over-exploited species, cooperative subsidies, reduced competition, permits)

a. Positive outcome	b. Negative outcome	c. Rank of importance

How do you think this will change in the future, affect income

SECTION 5: FIRST STAGE OF MANAGEMENT PLAN – MANAGEMENT AND COMPLIANCE

43a. If yes, what are they?

Management tool (for example....)	Description	Location/where restrictions effective?	Support it?	When introduced? (2004, more recent)
Zoning				
Temporal/seasonal restrictions				
Gear restrictions				

45. What are the consequences of rule-breaking with the management plan restrictions?

47. Do you believe the enforcement of fishing restrictions is fair and appropriate? Would you prefer community-led enforcement? Why?

a. Fair	b. Unfair
c. Community-led Yes	d. Community-led No

Why:

48. Do you agree with/support these restrictions? Why?

a. Agree	b. Disagree
----------	-------------

Why:

50. Do you have a license from DIGIPESCA and HCRF?

	a. Yes	b. No
DIGIPESCA		
HCRF		

51. Where did you go to obtain your license? (ceiba, community...)

52. Are there any conditions to keep the license/for renewal of license? (log books, gear restrictions..)

a. Yes	b. No
c. Conditions	

SECTION 6: SECOND STAGE OF MANAGEMENT PLAN - WILLINGNESS TO PARTICIPATE

53. If you were asked to be involved in meetings and discussions about the CCMPA and management plan, would you be willing to participate?

53b. If no, why not?

i. Yes		ii. No		iii. Don't know	
Bii. Lack of time		Biii. Lack of interest		Biv. Other	
		Biii. Feel unable to contribute			

Ask Jess' questions here

55. What jobs would you consider doing instead of fishing?

a. Job given by interviewee	Job/occupation	b. Any from list?		c. Prefer to what doing now? Ranking	d. If so, why?
		Yes	No		
	TOURISM				
	Souvenirs				
	Boat trips				
	Watersports				
	Service (hotel)				
	FISHING				
	Traps				
	Line				
	Spear				
	Nets				
	AQUACULTURE				
	AGRICULTURE				
	SALARIED EMPLOYMENT				
	INFORMAL				

56. Are there any training courses/have you been on any training courses for alternative livelihoods? If yes, can you please give details?

a. Yes	Details	b. No

57. What are the greatest threats to your livelihood?

58. Is there anything else you'd like to tell me about fishing, livelihoods and fish stocks of the CCMPA?

i.e., other livelihoods during fishing off seasons

60. Do you have any suggestions for how we can improve this survey?

61. When is the best time of day/day to interview other fishers?

THANKYOU FOR YOUR HELP AND TIME WITH THIS SURVEY.

9.3: Appendix C: Individual Fishers Survey 2007

FISHERS SURVEY

Fisher Number (Name is given): _____

Date: _____

Village: _____

Interviewer: _____

Age: _____

Introduction: Marine scientist/marine researcher from Newcastle University, studying management of MPAs, particularly interested in ones that already have management in place. Would like to ask some general questions about artisanal fishing, covering fishing areas, effort, gears, knowledge of environmental resources, and will include some economic questions.

SECTION 1: DEMOGRAPHIC INFORMATION

1. Were you born here?

a. this community	b. this region	c. this country	d. other country
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If no to Q.1

2. Why did you move to this village?

a. fishing	b. other work	c. family	d. health	e. other
------------	---------------	-----------	-----------	----------

3. How long have you lived here?

A. < 3 years	B. 3-10 years	C. 11-20 years	D. > 20 years
--------------	---------------	----------------	---------------

4. Why did you first start fishing? (*Educational level?, family, money etc...*)

A. Family	B. No other opportunities	C. Other.....
-----------	---------------------------	---------------

5. How many years have you been fishing?

A. Up to 3 years	B. 4-7 years	C. 8-10 years	D. >11 years
------------------	--------------	---------------	--------------

6. Including you, how many people live in your house?

A. Adult male-	B. Adult Female-
C. Child male-	D. Child Female-

7. Is fishing your household's most important source of income?

8. Do you use a boat? Ownership? Individual? Cooperative?

a. Boat type	b. Length (m)	c. Motor (Y/N)	d. Owned? (Y/N)	e. Ind/Coop

9. How did you find out about fishing regulations? (How, when and where you can fish?)

A.HCRF B. Patronato C. Other.....

10. Do many people break the rules? If yes, how do they break rules? Why do you think they do?

a. Yes	b. No
c. How	d. Why

11. Do you agree with/support these restrictions? Why?

a. Agree	b. Disagree
----------	-------------

Why:

12. Would you change the way information is passed between the HCRF and the community? How?

a. Yes	b. No
--------	-------

How:

13. If you were asked to be involved in meetings and discussions about the CCMPA and management plan, would you be willing to participate?

13. b. If no, why not?

A. Yes	B. No	C. Don't know	
Bi. Lack of time	Bii Lack of interest	Biii Feel unable to contribute	Biv. Other

14. Do you receive any help from any organisations? (i.e., money, boats, loans, from either HCRF, DIGIPESCA, Tony and Adoni's NGO) If so, what is it/how much?

a. Yes	Value	Who	b. No
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15. Would you like your children to become fishers? Why/why not?

a. Yes	b. No
--------	-------

Why/why not:

16. Age _____	17. Sex _____	18. Religion _____
19. Languages _____	20. Ethnicity _____	
21. Education _____	(equivalent in years _____)	

9.4: Appendix D: Abstracts from research students projects 2007

5.1.9.1 Victoria Shaw: Tourism Development in Garifuna communities along the north coast of Honduras

This study compares residents attitudes and their perceived impacts to tourism between two Garifuna communities with different levels of tourism development, along the north coast of Honduras. The level of tourism development within the communities was assessed using Butlers (1980) Tourist Area Life Cycle and other methods. Six weeks were spent conducting community research using household surveys, interviews and Participant Observation together with secondary research by way of Key Informant interviews.

Comparative observations suggest that attitudes to tourism do not vary between the two communities with many of the perceived impacts being shared. An unexpected finding was that attitudes seemed to vary more within the same community than between the two different ones. Conclusions imply that residents in both communities hold positive attitudes to tourism as they see it as an economic alternative to the traditional fishing industry that has recently come under strict restrictions as well as a way of re-installing the Garifuna culture back into the lives of the younger generations.

5.1.9.2. Helen Pollard: The division of labour by gender within Honduran Garifuna communities.

This dissertation focuses on the division of labour by gender within Garifuna communities on the northern coast of Honduras, Central America. The aim of the dissertation was to gain a better understanding of the division of labour by gender within two sample communities, alongside the aspirations of residents in relation to work before assessing the possible routes by which the Garifuna can improve their employment opportunities. The study has a particular focus on the current role and future opportunities of women within the communities.

Research Questions:

- 1 The existing division of labour by gender within the Garifuna communities.
- 2 The opinions and aspirations of the Garifuna (particularly females) in relation to work.
- 3 Opportunities for the Garifuna women to work (possibly within the ecotourism industry).

Data was collected using a variety of methods including naturalistic and participant observation, semi structured interviews and focussed interviews with both residents and key informants. Analysis found that there is currently a very strong division of labour by gender within the Garifuna communities, with employment opportunities extremely segregated by sex as well as sex stereotyped. Aspirations in terms of individual employability are low but enthusiasm for obtaining employment is high and residents are keen to acquire a stable, regular income. The Garifuna have high aspirations for their children and see education as the route by which secure, formal employment can be achieved. This perception is perhaps unrealistic as without there being a sufficient job market in the region, even the most highly educated would struggle to find a salaried job. If they are to improve their employability, the Garifuna need to unite and act with agency, looking at alternative routes into employment with local scale, sustainable, grass roots projects. Whilst there are currently few opportunities for employment, the labour market in the region has the potential to increase substantially in the next decade due to developments in the tourism industry. The Garifuna could also help to improve their own employability with vocational training schemes and through the formation of cooperatives.

5.1.9.3 Anisha Grover

5.1.9.4 Jessica Wallington

5.1.9.5 Leah Jorgesen