

UNEP Caribbean Large Marine Ecosystem Pilot Reef Fisheries and Biodiversity Project: Best Practices and Lessons Learnt



UNEP Caribbean/Regional Coordinating Unit
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1. INTRODUCTION

The purpose of this document is to collate and showcase the best practices and lessons learned under the Caribbean Large Marine Ecosystem (CLME) Project's Pilot Project on Reef Fisheries and Biodiversity. Sharing this information will contribute to strengthening management of the pilot sites and other sites within the Caribbean Large Marine Ecosystem and Adjacent Regions.

The CLME Project was a five year (2009 – 2013) regional project valued at approximately US\$7 million and implemented through a partnership comprising:

- **Funding Agency:** Global Environment Facility (GEF)
- **Executing Agency:** United Nations (UNOPS)
- **Implementing Agencies:** United Nations Development Programme (UNDP) and the Inter-governmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organisation (IOC-UNESCO)

The overall objective of the Project was sustainable management of the shared Large Marine Resources (LMR) of the Caribbean LME and adjacent areas through an integrated management approach that will meet the World Summit Sustainable Development Target for sustainable fisheries. Outputs included analysis of root causes of CLME problems, improved knowledge sharing and Pilot Projects. More details on the CLME Project are available at www.clmeproject.org.

The Reef Fisheries and Biodiversity Project was a Pilot Project of the CLME Project valued at US\$1.155 million for implementation by the United Nations Environment Programme (UNEP) Caribbean Regional Coordination Unit (CAR/RCU) from January, 2011 to June, 2012. The UNEP CAR/RCU was established in 1986 and is the Secretariat for the Caribbean Environment Programme (CEP)¹, which is a sub-programme of UNEP's Regional Seas Programme. The CEP aims to promote regional cooperation for the protection and sustainable development of the marine environment of the wider Caribbean Region through the implementation of activities which support the Cartagena Convention and its three Protocols. Hence, the CEP has three main sub-programmes one of which supports the Specially Protected Areas and Wildlife (SPA) Protocol. There are four main components of SPAW Programme:-

- Strengthening and Management of Protected Areas in the Wider Caribbean Region
- Development of Guidelines for the Management of Protected Areas and Species
- Conservation of Threatened and Endangered Species
- Conservation and Sustainable Use of Marine and Coastal Ecosystems

Participation in the CLME Project, and specifically, management of the Reef Biodiversity and Fisheries Pilot Project is one of the major activities of the SPAW Programme.

Reef Biodiversity and Fisheries Pilot Project

Overall Objective: To promote the ecosystem-based approach for the conservation and effective management of coral reef ecosystems and their associated resources in order to maintain their functional and structural integrity and biodiversity, and to ensure economic and social benefits for local communities and the region as a whole.

The three target sites and local implementing agencies were:-

¹ <http://www.cep.unep.org/>

- Sea Flower Biosphere Reserve, San Andres Archipelago, Colombia - CORALINA²
- Pedro Bank, Jamaica – The Nature Conservancy (Jamaica Office) TNC³
- Transboundary sites (2) along the coast of Hispaniola⁴
 - Montecristi National Park, Dominican Republic – Ministerio de Medio Ambiente y Recursos Naturales (MMAR)
 - Caracol Bay, Haiti – Fondation pour la Protection de la Biodiversite Marine (FoProBiM)



Figure 1: Map of the WCR showing the three target sites for the Pilot Project

The third area was comprised of two sites, with the Dominican Republic site (Montecristi) starting with the other two and the fourth site, in Haiti (Caracol) having activities for only

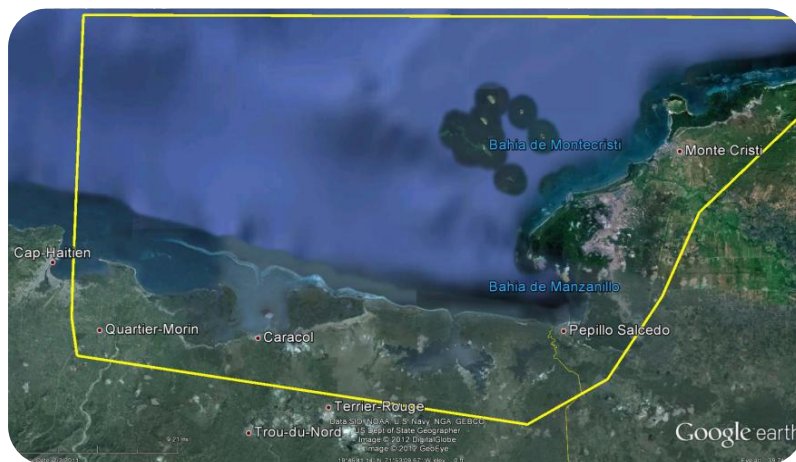


Figure 2: Satellite image showing Hispaniola sites

² See red star in Figure 1

³ See green star in Figure 1

⁴ See yellow star in Figure 1 and also see Figure 2

six months.

Pilot Project Outcome: To contribute towards the sustainable use of reef fisheries and marine biodiversity through the application of the ecosystem based approach and on the basis of the principles and values of good governance:

- Strengthen and improve the governance of reef fisheries and marine biodiversity management at the local, national and regional levels through improved regulation, enforcement and community involvement in large reef systems with demonstrable, cross-cutting multi-sectoral linkages;
- Enhance marine biodiversity conservation through the strengthening of existing marine protected areas to enable them to meet their conservation objectives;
- Facilitate the transfer of best practices and the dissemination of lessons learnt on technical aspects and governance systems; and
- Promote the ratification of international agreements relevant to the sustainable use of coastal and marine resources.

Activities were implemented at all four country sites under the following thematic areas:-

- (i) Strengthening of existing management frameworks based on the principles of the ecosystem approach (assessment, capacity building, monitoring and evaluation) by updating and generating habitat maps and site surveys of under-studied areas: e.g. conduct ecological assessments and training and develop strategic plans.
- (ii) Review and analysis of existing management regulations and enforcement mechanisms: e.g. establishment of collaborative enforcement programme.
- (iii) Public awareness and education outreach enhancement (with a focus on regulations and enforcement)

With the assistance of the Project Implementation Unit, efforts were made to ensure identification of best practices and lessons learned and activities implemented to share these in order to promote adaptive management.

The information below provides a brief description of each of the four sites and their activities and achievements under the Project.

1.1 Colombia/CORALINA

The Seaflower Marine Protected Area (MPA) surrounds the three, small inhabited islands, uninhabited cays and coastal and oceanic coral reefs of the San Andres Archipelago, which is a Colombian administrative department in the South-western Caribbean. It was declared in 2005 and is part of the Seaflower Biosphere Reserve declared by UNESCO's Man and the Biosphere Program in 2000. The Biosphere Reserve includes three regional parks and one national park. The Corporation for the Sustainable Development of the Archipelago of San Andres, Old Providence and Santa Catalina (CORALINA)⁵ which is the regional environmental management agency, is responsible for management of these sites. The largest island and center of government, San Andres Island is about 800km northwest of Colombia and 100km east of Nicaragua. The Seaflower MPA covers 65,000 km² and is a

⁵ <http://www.coralina.gov.co/>

multiple use protected area zoned for strict conservation through to controlled commercial fishing. The coral reefs include barrier and fringing reefs, atolls, lagoons and less defined coral banks extending over 500km.



The Seaflower MPA Pilot Project was successful in achieving all planned outputs and was able to exceed the proposed targets. Background map taken from is.invemar.org.co/geovisoranh/.

Table 1: Proposed and Actual Outputs Colombia

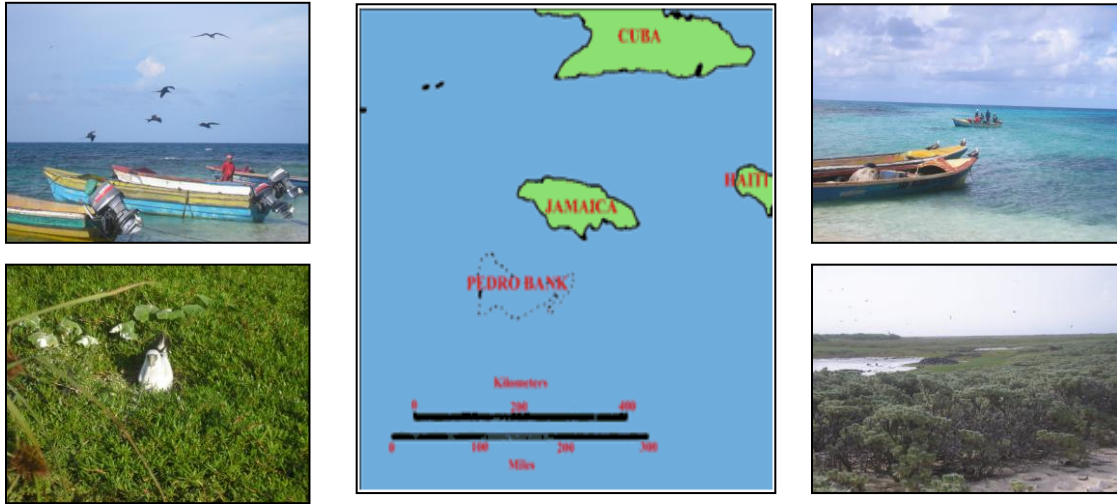
Proposed Outputs	Actual Outputs
Strengthen Integrated Ecosystem-based Management	
One (1) Research Expedition to Seaflower MPA (Northern Section) to collect information on key species and ecosystem conditions	Three (3) Research Expeditions to Seaflower MPA (Northern Section):- (i) Collection of information on key species and ecosystem conditions (on Quitasueño, Serrana and Roncador Atolls) in collaboration with the National University, Caribbean Campus (ii) Collection of Queen Conch for re-colonisation project in MPA (Central Section) in collaboration with the Fishing & Agriculture Secretariat (iii) Collection of information on key species and ecosystem conditions (on Seranilla, New and Alice Banks) in collaboration with the Khaled Bin Sultan Living Oceans Foundation
Watershed erosion control in MPA (Southern and Central Sections): Bottom House and Fresh Water, in Providence island	Gullies were cleaned of trash and organic material and the rocks used to construct 18 pools and roman arches to increase retention of water and reduce erosion, in collaboration with Patrimonio Natural, Fund for Biodiversity and Protected Areas
Beach monitoring in MPA Southern	Support to existing beach monitoring was

Proposed Outputs	Actual Outputs
and Central section	provided
Regulations analysed/Enforcement Mechanisms Identified	
Legal fishing framework analysed	Analysis of fishing framework complete
Participatory enforcement planning process underway	Participated in national initiatives
Training of authorities and stakeholders	Participated in training activities
At least one new regulation to improve reef fish conservation	Regulation on shark fishing promulgated and others being studied
Launch Public Education and Outreach Programme	
One(1) Queen Conch updated curriculum	One (1) Queen Conch updated Curriculum and shared with 500 students
One (1) Teacher Training Workshop	Three (3) Teacher Training workshops (30 teachers)
Education Campaigns on key species (4)	Education Campaigns on key species (5) involving 500 students
Design and install 6 MPA signs at selected sites	20 MPA signs installed, in collaboration with Fishing and Agriculture Secretariat
High quality MPA documentary	MPA documentary in addition to 10 video clips for public awareness
	Play about Coral Reef Biodiversity (reaching 250 students)
	Door to door campaigns and face to face dialogues

1.2 Jamaica/TNC and Fisheries Division

Pedro Bank is located approximately 80 km south-southwest of the island of Jamaica and with a total area of 8,040km² is one of the largest offshore banks in the Caribbean Basin. The area is composed of a variety of marine habitats such as sand, coral reefs, deep reefs, seagrass beds and three coral cays, known as the Pedro Cays. Due to its distance from the mainland, it has relatively intact biological systems and is one of Jamaica's last remaining healthy marine ecosystems. The large number of shipwrecks on the Bank led to its declaration as an Underwater Cultural Heritage Site in 2004. Northeast Cay is 10ha and partially occupied by fishers in temporary structures. Middle Cay is 4ha and is occupied by a fishing village, a Police & Coastguard Outpost and the Pedro Bank Field and Research Station. Southwest or Bird Cay is about 14ha and is almost completely devoid of human intervention since the last fifty or more years. Southwest Cay and the waters and reefs around it were declared a Special Fishery Conservation Area in 2011. The area is of major economic significance for finfish, spiny lobster and Queen Conch and is Jamaica's largest artisanal and commercial fishing ground. It is of critical importance for biodiversity, particularly, nesting seabirds and sea turtles.

The Nature Conservancy (Jamaica Office) played the lead role in the implementation of this project, working closely with the Fisheries Division and other stakeholders.



The Pedro Bank and Cays Project was successful in achieving most planned outputs despite numerous challenges which severely delayed the project.

Table 2: Proposed and Actual Outputs Jamaica

Proposed Outputs	Actual Outputs
Strengthen Integrated Ecosystem-based Management	
Pedro Cays Biodiversity and Conservation Management and Zoning Plan	Management Plan for Pedro Cays and Surrounding Reefs (N.B.: UNEP/TNC agreed at start of Project that production of a Zoning Plan would not be possible with the available funds and time)
Equip and Staff Field Station	(i) Equipment procured to enable conservation and management activities (ii) Staff hired for community education, outreach, enforcement and management activities
Conduct AGRRA Survey to update 2005 AGRRA Survey data	AGRRA Survey, benthic mapping and plankton sampling during expedition in collaboration with the Khaled Bin Sultan Living Oceans Foundation and numerous stakeholders
Establish Pedro Cays Fish Sanctuary	(i) Southwest Cay Special Fishery Conservation Area declared in 2011 following survey of proposed boundary. (ii) Boundary marked with buoys (iii) Conservation Officer and Wardens hired
Management and Conservation of Masked Boobies	(i) Clean-up of Middle Cay, provision of incinerators and cat eradication to improve nesting success of Masked Boobies (ii) Seabird conservation training workshops, tagging and tracking of Masked Boobies Plans for habitat restoration were cancelled

Proposed Outputs	Actual Outputs
	following discussions with ornithologists
Regulations analysed/Enforcement Mechanisms Identified	
Inform and support Government of Jamaica (GoJ) with efforts to pass new National Fisheries Bill and Policy	Offer of assistance (for contracting of legal personnel to assist with helping with new Fisheries Bill and preparation of new regulations) was made formally to the Fisheries Dept by May, 2012. This was not responded to formally until Sept, 2012 (December in writing). Drafting of the TOR was initiated but not completed at the end of the Project.
Train and develop an effective management and enforcement presence on the Pedro Cays comprised of government, NGO and community representatives	(i) Conservation Coordinator attended 3 training workshops (ii) TNC organized seabird conservation workshop (iii) Fish sanctuary training workshop held for community members from Pedro Cays, Treasure Beach and Galleon Bay (iv) Purchase of a boat engine and materials for the JDF Coast Guard to allow them to return their small vessel to action, for joint patrols with Marine Police and Fisheries Officers
Continue efforts to assist Pedro Cays communities to form organisations for greater involvement and responsibility in site management	Limited work due to the need to terminate the contract of the contractor due to non-performance
Launch Public Education and Outreach Programme	
Develop public awareness and outreach materials and activities (newsletters, internet materials, etc.) to promote education and awareness and develop conservation leaders among the fishing community.	Outreach material created and disseminated:- Posters Training videos Signs These were produced late and disseminated after the close of the Project, due to termination of the contract mentioned above.

1.3 Dominican Republic/Ministry of Environment

The Montecristi National Park is located on the north-west coast of the Dominican Republic and was chosen in part as a potential pilot site for trans-boundary collaboration with the Republic of Haiti. It extends from the border with Haiti to Punta Rucia in the Dominican Republic and covers an area of 550 Km² including coastal lagoons, saltmarshes, mangroves, seagrass beds, beaches, sand dunes, small keys and coral reefs. Montecristi has the third largest fishing population in the Dominican Republic and is mainly small-scale artisanal fishery; most of the high-sea fishing vessels in the country operate from the adjacent province. The terrestrial component of the site includes a sandstone mesa 237 m in elevation with a dry forest including an endemic plant (*Salvia montecristina*).

The Ministerio de Medio Ambiente y Recursos Naturales (MMARN) is responsible for the site and project.



The Montecristi Project was successful in achieving all planned outputs.

Table 3: Proposed and Actual Outputs Dominican Republic

Proposed Outputs	Actual Outputs ⁶
Strengthen Integrated Ecosystem-based Management	
Technical Reports (biophysical information) and Plans (ecosystem-based management)	(i) Technical Reports on flora and vegetation of the coastal area of Montecristi produced based on technical studies ⁷ :- <ul style="list-style-type: none"> • Evaluation of Coastal Lagoons in the province of Montecristi. • Characterization of the rocky coast of the province of Montecristi • Marine Expedition to Submarine Montecristi National Park to know the current status of reefs in the Province. (ii) The information from the above-mentioned and other documents was used to prepare: <ul style="list-style-type: none"> • Diagnosis of Natural and Social Situation of the Marine and Coastal Area of the province of Montecristi • Fisheries Management Plan and Zoning for the National Marine Park of Montecristi
Regulations analysed/Enforcement Mechanisms Identified	
	(i) Analysis of the national regulatory

⁶ All available reports and presentations can be found at <http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Paginas/Productos.aspx#descr>

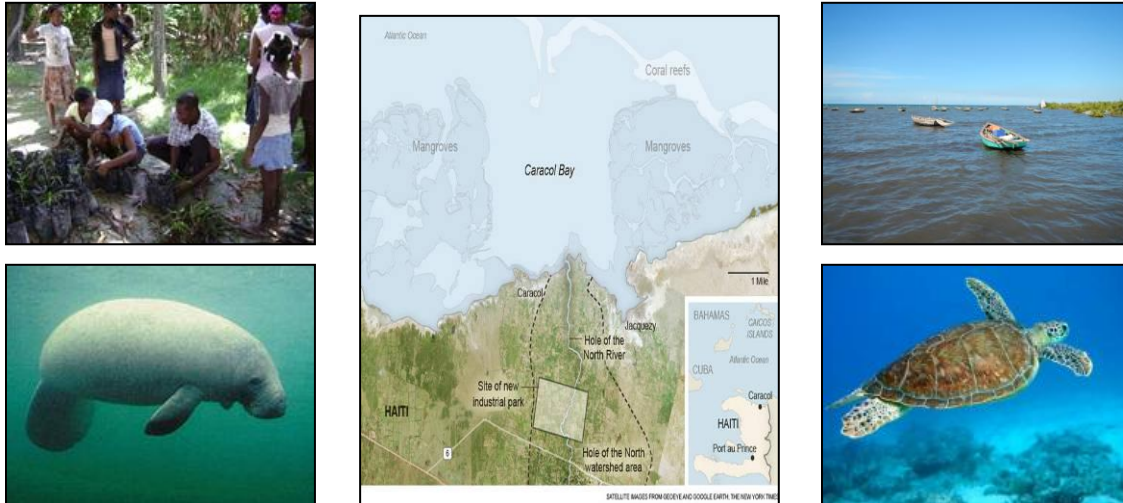
Proposed Outputs	Actual Outputs ⁶
	<p>framework and policies that set the political framework were conducted leading to two documents:</p> <ul style="list-style-type: none"> • Compilation of Legal Documentation (National and International) relating to the regulation of fishing activity in the Dominican Republic • Governance of fisheries in the province of Montecristi. <p>(ii) Arising from the above-mentioned documents, two proposals were developed</p> <ul style="list-style-type: none"> • Proposed Regulatory Framework for Fishing Activity Zone Montecristi • Proposed Institutional Arrangement for the Implementation and Enforcement of a Collaborative Participatory Management Plan and its regulatory framework
Launch Public Education and Outreach Programme	
Hold meetings, workshops and training activities with stakeholders	<ul style="list-style-type: none"> (i) workshop with representatives of fishing groups Montecristi (ii) workshop with governing fishing Institutions of Montecristi (iii) workshop with representatives of civil society groups in Montecristi (iv) workshop with neighbourhood committees of Montecristi (v) Training programme on Ecosystem Management for public officials and stakeholders

1.4 Haiti/FoProBiM

Caracol Bay is situated along the north-eastern coast of Haiti, in close proximity to the Montecristi National Park. The Bay is located within a large expanse of mangrove forest with lush sea grass beds and a fringing coral reef. There are several fishing communities which depend on the marine habitats for their livelihoods, however the area is over-fished and the coral reefs are being destroyed for use in making lime for construction. The mangroves are under threat from wood-cutters and charcoal burners as wood and charcoal are the main fuels for cooking in Haiti and in addition, areas of mangrove are cleared to create salt pans for salt production.

This project was actually implemented over about a six month period, due to challenges and delays by the Haitian government in engaging in project activities. Eventually, Fondation pour la Protection de la Biodiversite Marine (FoProBiM) was involved as the project partner and implemented the various activities towards achieving project objectives. Due to the

limited time and lack of scientific data on the site, the focus was on engaging local community members and using participatory approaches to identify the problems and recommend solutions.



Due to the exceedingly late start in implementation, and lack of organized groups, the Caracol Bay Project had to focus primarily on mobilization activities, however these were successful and additional outputs achieved as well.

Table 4: Proposed and Actual Outputs Haiti

Proposed Outputs	Actual Outputs
Strengthen Integrated Ecosystem-based Management	
Develop an Environmental Steering Committee composed of stakeholders (representing sectoral and community interests)	Steering Committee established following numerous community and sectoral formal and informal meetings
Develop a Mangrove Management Plan	Prepared an outline/framework on which to build future initiatives
Identify major coastal and marine environmental issues and recommendations for action to improve management and protect the resources	Prepared a document listing the issues of concern to the stakeholders and their recommendations for solutions.
Regulations analysed/Enforcement Mechanisms Identified	
	Prepared an abridged version of Haitian fisheries and coastal and marine laws in French and Creole
Launch Public Education and Outreach Programme	
	(i) Prepared and disseminated a flyer about the CLME (in French) (ii) Prepared an educational pamphlet on mangroves (in Creole)

Table 5: Table showing main outputs for each objective

	Seaflower MPA, Colombia	Pedro Bank & Cays, Jamaica	Montecristi MPA, Dominican Republic	Caracol Bay MPA, Haiti
Integrated Ecosystem-based Management	<p>(i) 3 research expeditions to Northern Section of MPA – information on key species & ecosystem status gathered and analysed</p> <p>(ii) Erosion control (cleaned gully beds, removed obstacles e.g. rocks, to water flow and used rocks to build natural pools and roman arches (18) to increase water retention</p> <p>(iii) Beach monitoring on San Andres and Providence – at least 3 times on 30 beaches annually</p>	<p>(i) Management Plan created with input from community and other stakeholders</p> <p>(ii) Field Station operational and has hosted many groups</p> <p>(iii) Biological survey data collected</p> <p>(iv) Updated biological information on seabirds and management plan for birds and turtles developed and tracking programme implemented</p> <p>(v) Marker buoys were installed to demarcate the SW Cay sanctuary</p>	<p>(i) Zoning and Fisheries Management & Strategic Plan completed</p> <p>(ii) Publicly accessed Management Information System based on GIS</p>	<p>(i) Introductory consultations and discussions on priorities for ecosystem management held</p> <p>(ii) Compilation and analysis of the status of the ecosystem in Caracol Bay based on stakeholder feedback and literature completed</p> <p>(iii) Development of a participatory community process for the management, follow-up and application of a management plan initiated</p>
Regulations analysed/enforcement mechanisms identified	<p>(i) Legal Fishing Framework analysed to improve regulations and reduce illegal fishing</p> <p>(ii) Shark fishing regulation promulgated, others still under investigation</p>	<p>(i) Training: Fish Sanctuary laws and regulations and best management and enforcement practices; and a regional Seabird Conservation and Seabird Workshops for GOJ and NGO stakeholders from across the Caribbean to impart practical seabird conservation techniques</p>	<p>(i) National policy framework reviewed</p> <p>(ii) Manual of good practices completed</p> <p>(iii) Training for public officials and stakeholders on laws conducted</p>	<p>Completed analysis and identification of gaps in the existing legislative framework related to MPAs</p>

	Seaflower MPA, Colombia	Pedro Bank & Cays, Jamaica	Montecristi MPA, Dominican Republic	Caracol Bay MPA, Haiti
		<p>(ii) Individual training and conference participation for management effectiveness, enforcement techniques and networking</p> <p>(iii) SW Cay declared Special Fish Conservation Area</p>		
Public Education, Awareness and Outreach	<p>(i) Queen Conch curriculum updated and circulated: 500 students; 30 teachers; Book published</p> <p>(ii) Key species campaigns for 5 species: Spiny Lobster, Snappers, Sharks, Lionfish and Parrotfish: Booklets, field trips (500 students), play (250 students)</p> <p>(iii) MPA Awareness/Sensitisation: Signs (20), 1 17-minute video (10 video clips)</p>	<p>(i) 500 DVDs with 3 short documentaries (10-15 minutes each): Protecting Pedro: SW Cay Fish Sanctuary; Connecting the Caribbean with Seabirds Conservation, and Massa God Fish CAN done – a documentary of a Jamaica- Belize fisher exchange produced and posted and distributed</p> <p>(ii) 5 posters printed with 500 copies each and distributed: Queen conch regulations; night spear fishing is illegal (2 versions); spiny lobster regulations and SW Cay fish sanctuary.</p>	<p>(iii) Monitoring and Evaluation mechanism designed and in use</p> <p>(iv) Training for Fishermen on best practices conducted</p> <p>(v) Documentation and distribution of Lessons Learnt</p>	<p>(i) Improved sensitisation of the value of mangroves, the marine protected area (500 flyers) and management plan</p> <p>(ii) Established Steering Committee of key stakeholders with a view to long-term collaboration for the monitoring and evaluation of the trans-boundary site</p>

2. LESSONS LEARNED

The information for this section was garnered from a review of Terminal and other reports emanating from the CLME Biodiversity and Reef Fisheries Pilot Project. This included the Report on the Regional Workshop and Exchange Experiences in Conservation, Fisheries Management Practices and MPA Implementation Strategies in the Caribbean, held in April 2012 in San Andres Island, Colombia⁸. The draft document was reviewed by the pilot project partner organisations and their comments and revisions included in the final document.

2.1 Pilot Projects

2.1.1 Colombia/CORALINA

The Value of Coordination and Collaboration

Strategic coordination and open communications will lead to collaboration with other stakeholders which can increase resources (human, equipment, financial, knowledge) and will most likely result in an increased level of outputs and a better outcome. With respect to outcome, the collaboration is likely to result in formal or informal agreements to work together in the future, thus sustaining the flow of benefits to a project or programme. In the case of CORALINA, they planned to have one expedition to the Northern Section of the Seaflower MPA in order to gather data, but collaboration with national and international organizations resulted in a total of three expeditions.

The Importance of Practical Involvement of Community Members

Involving community members in project activities particularly practical exercises e.g. field trips for students, involving students in helping to share the environmental messages, involving fishers in research and monitoring. These activities facilitate “learning by doing” which is the most effective way of learning – encouraging greater understanding, stimulating interest in long term involvement and motivating appropriate practices.

The Importance of Follow Up Meetings/Fora

It is important and useful to go back to communities/stakeholders to share the information they have helped to obtain. It helps validate their knowledge and builds trust between the stakeholders and the managers.

The Value of International Conventions and Designations

CORALINA shared on the relevance and usefulness of International Conventions and Designations, with reference to the UNESCO Biosphere Reserve Status of the Archipelago. They noted that since this designation, fisheries regulations had been strengthened and scientific exchanges (involving international and national experts) had increased. The increase in the exchanges including through research and workshops had led to advances in fisheries science knowledge which contributed to the improvements in the legislation.

⁸ Final Report at

http://www.coralina.gov.co/intranet/index.php?option=com_docman&task=doc_view&gid=715&tmpl=component&format=raw&Itemid=88889107&lang=es&ml=1

2.1.2 Jamaica/TNC and Fisheries Division

The Value of a Management Planning process for improving governance

The management planning process served as an opportunity to bring stakeholders together on a number of occasions to be involved in the planning and resolution of Pedro Cays related issues and problems. The process identified the actions that would need to be taken and this helped to clarify the roles and responsibilities of the different agencies. Whilst the process indicated the need for a clear leader and suggested an appropriate agency, it could not mandate this role and it did not eventually lead to any agency accepting the role as being overall responsible for the site and the coordination of the multiplicity of agencies that need to be involved to achieve the solutions to the issues raised but it did serve to bring awareness to a broader stakeholder group of the breadth of entities that were genuine stakeholders

Field station construction prior to start of Pilot Project

Pedro Bank is an offshore location, about 80km from the mainland and is occupied on a semi-permanent basis by fishers in small shacks mainly. The establishment of the Field Station was critical to the success of the project as it provided a place of relative comfort in a harsh environment with no electricity or fresh water or other basic amenities, except brought on the Boat from mainland Jamaica. Without this field station, the research, monitoring, planning and management activities would have been impossible. It was fortuitous that the Field Station was built before the start of the project, not only to provide the facilities to combat the rugged conditions but also as it would have been almost impossible to construct the building in addition to implementing the other project activities given the timeline and the difficulties experienced with field station construction.

The challenges of working in a remote location

Pedro Bank is an offshore location, about 80km from the mainland The Jamaica Defence Force Coast Guard has a base on the Middle Cay and transports its staff on a weekly basis (and the project staff on an as needed basis in their regular weekly trip) out to the Cays without charge as their contribution to the conservation work. There were a number of occasions where foul weather hindered the planned trips out to Pedro and sporadic occasions where there were boat transportation issues. But frequently foul weather stalled and limited the planned conservation work. The remoteness coupled with the once weekly available transport meant that when foul weather prevented the conservation work planned, field staff could not leave the Cays and do something else; so time was lost and some implementation and deadlines were negatively impacted. Given the remoteness more time ought to have been factored in for delays due to weather and transport issues.

The value of collaboration with international organisations

The experience of collaborating with the Sultan Bin Khaled Living Oceans Foundation was extremely useful as it brought internationally experienced and recognised scientists to bear on site selection, data collection and analysis, and offered vital exposure to newer approaches, newer equipment and technologies that were instrumental in achieving the project goals for this aspect of the project.

Be Cautious in Estimating Timelines

Project activities dependent on government decisions and processes outside of project team control e.g. enacting legislation, are likely to take a long time. For example, the length of time taken for the Government of Jamaica to designate the South-West Cay Special Fishery Conservation Area had a negative impact on project implementation. Ideally more time could have been expected for the designation to take place and other activities would have been scheduled accordingly.

The Value of Involving, Working with and Building Capacity of Local Communities

Despite their concerns and often scepticism, the Pedro Cays fishing community was generally supportive and willing to participate, as they were aware of the problems that their presence and use of the Cays and Bank was creating for the living marine resources of the site. Often, relatively simple but practical actions that benefit the community e.g. rodent eradication, help increase community involvement. The willingness of community members to assist with management activities showed that if their capacity was built through training and assigning of responsibilities with the necessary supervision, that they were capable of playing a positive role in management. Also, if involved in planning, such that they were able to recommend solutions and then assistance provided towards that end, then community members were able to play an important role in management and conservation of the living marine resources and surrounding environment.

The Resilience of Nature

The nesting survival of the Masked Boobies on Middle Cay increased by 35% just four months after the major clean-up and cat and rat eradication exercises.

The Heterogeneity of Communities

It is always useful to remember that just because people will not have the same attitudes and interests just because they live or work in the same geographic area or use the same resources. The attitudes, interests and practices of the fishers on the Pedro Cays differ depending on their place of origin (town on the mainland), age and educational background amongst others. This therefore affects the approach needed.

Addressing Governance Challenges

Governance was a challenge in the Pedro Bank pilot project, as the agency most stakeholders felt intuitively was responsible (Fisheries Division) did not view itself as being responsible for many of the issues e.g. living conditions of the fishers, even though it was impacting the resources. The governance discussions displayed very quickly that there was lack of clarity with regard to which entity has ultimate responsibility for the Bank and Cays and in fact that no one entity has that responsibility. Though the governance solutions were discussed and recommendations made during the project timeframe there has not yet been a process for further discussion and implementation of the recommendations. However, the process to date has provided steps in the direction of enlightening the stakeholders to the range of issues and that need for an "owner" which seems to be needed at a higher level than the entity many assume ought to be the "owner".

2.1.3 Dominican Republic/Ministry of Environment

The Importance of Involving Stakeholders

Whilst the Montecristi Project was managed by the Ministry of Environment and Natural Resources, they recognized the importance of involving civil society, academic and local stakeholders. This was depicted in the use of workshops and training activities as well as the development of a proposal for Institutional Arrangements for the Implementation and Enforcement of a Collaborative Participatory Management Plan.

Importance of a stakeholders structured governance model

The active participation of the different stakeholders as equals in the implementation of a governance structure (locally called a dialog table) guided by a co-management plan are the immediate activities of the governance model proposed by the pilot project. Promote this participation and the stakeholders empowerment of the process are the goals of it.

2.1.4 Haiti/FoProBiM

The Challenges of Mobilising Community Involvement

Mobilising Community stakeholders to ensure community involvement is time consuming and requires excellent facilitation skills and experience in participatory approaches. Mobilisation is even more challenging in the absence of existing organizations as work has to be done at the individual level instead of simply liaising with groups. Establishing a Steering Committee took all six months of the project for FoProBiM and concern was expressed as to how long-lasting the impact of the project would be. For example, if groups do not have the necessary capacity they may not meet or implement any activities. Unless there is a strong community-based organisation (often dependent on one or a few key individuals) then there will be a need for significant capacity building by way of training and mentoring amongst other approaches.

Community members and stakeholders will have different interests and priorities and therefore they will have to be convinced of the importance of the project issue and its relevance to their needs. Further, they will have to be convinced that it is worth their time to be involved and that this involvement will make a difference. This is particularly challenging for poor communities, where members are more concerned about day to day needs than longer term goals e.g. FoProBiM's report notes, "the continuing Haitian mantra of 'I can't stop someone else from making a living (eating)'".

Challenges due to Lack of Information at the Community Level

A major conflict between Haitian and Dominican fishers was reported by the Haitian fishers and it became clear that they did not know where the marine boundaries were between the two countries.

Government Involvement is Necessary though Sometimes Challenging to Obtain

The project in Haiti was impacted by the weak governance exhibited by the Ministry of Environment at that time. It is not clear why the Ministry did not implement project activities nor why later when an NGO was given these responsibilities, the Ministry and its Officers, despite invitations, did not participate in meetings. The FoProBiM Report

states, “This project was undertaken under particular circumstances in which delays by the Haitian government in engaging in project activities caused a situation in which alternate solutions for execution were required shortening the project execution period as well as the level of funding”. Another FoProBiM report notes that involvement of government agencies and representatives indicates (to the other stakeholders) the importance of a project and can help to provide support e.g. information and technical assistance.

2.2 Regional Lessons

2.2.1 Governance

(i) Involvement of, and Collaboration between Stakeholders

Successful management and conservation of natural resources will not be possible without the involvement of all stakeholders in a collaborative approach. No one group of stakeholders has the requisite resources and each stakeholder bears some level of responsibility. Involvement of the stakeholders – government, academia, civil society (NGO and CBO), private sector (various sectors and levels) and local community members helps ensure all issues are raised and addressed from different perspectives. Thus, the likelihood of developing successful strategies is increased. Further, the involvement of stakeholders in developing plans and strategies increases the likelihood of their participation in implementation. Collaboration between stakeholders in the planning and implementation of strategies creates synergies which enhance success.

(ii) Clarifying Roles and Responsibilities

One of the challenges identified, particularly in the Jamaican project, was the overlapping of roles and responsibilities and the importance of clarifying and agreeing on these. The management planning process and the review of legislation can be very useful in this regard. Development and signing of a Memorandum of Understanding or other similar document can be very useful in committing parties to carry out their roles and responsibilities. Organisations need to be clear that playing the lead role does not equate to having to implement everything but rather that they are responsible for reminding, encouraging and facilitating those who have been given responsibilities to effect their duties in a timely manner.

(iii) Building Capacity of Local Community Stakeholders

It is of critical importance to involve the stakeholders who live, work in and use the resources within the geographical area of focus. They are the people most likely to impact on and be impacted by management and conservation of living marine resources. Unfortunately, in the rural and often remote locations where there remain resources in need of conservation and management, community members are often poor and have limited education and organizational capacity. They are likely therefore to require awareness raising and capacity building to effectively participate in management and conservation of the target resources. Despite this, they are likely to be interested and willing to assist, as they have significant knowledge about the resources and will have seen the decline and degradation of the resources and know the impact on their lives.

2.2.2 Legislation

(i) The Value of International Conventions

The example of Seaflower with its UNESCO Biosphere Reserve designation under the UNESCO Man and the Biosphere Programme, highlighted the value of international conventions and programmes in terms of recognition and support nationally and internationally.

(ii) Awareness Raising and Training

The importance of raising awareness at the user and enforcement officer level was highlighted. Particularly, with new legislation e.g. establishment of the South-west Cay Special Fishery Conservation Area, Pedro Bank, Jamaica required public awareness raising activities and marking of the boundaries. Enforcement Officers will require training especially as (with collaboration) some may be from other agencies and may not be familiar with the legislation.

(iii) Fines and Sentencing

It was clear that there was an issue with the low level of fines in some cases and lack of enforcement (whether at the operational or judicial level). This is often because there is a perception amongst decision makers that natural resource management legislation is harsh on poor people and that it is not politically correct to “cause” poor people suffer for “just trying to make a living”. The interesting thing is that the users recognize that there need to be rules and regulations in place in order to sustain and even enhance their livelihoods. It is the good fishers who are willing to observe fisheries legislation that suffer for the bad when large-scale or small-scale offenders are not punished.

2.2.3 Marine Protected Areas

In all the pilot projects, the importance of marine protected areas was recognized at all levels – government, civil society and resource users. The use of environmental education and communication activities to make the connection between the health of the fishery resources, the other biodiversity composing the ecosystems, and the economic sustainability of the communities depending on such resources, strengthened understanding about the need for the protection of these areas.

2.2.4 Challenges and Solutions

Weak governance was one of the main root causes of the three most important problems impacting the Living Marine Resources of the Caribbean and hence was an area for focus under the CLME Project. Governance challenges were obvious in all four pilot projects, but had the greatest and most negative impacts where governance was weakest:-

(i) at the government (national and Ministry/agency) level in terms of:-

- high levels of bureaucracy which led to delays,
- limited acceptance of responsibility on the part of the most relevant agencies which led to limited involvement and action by key agencies.

In the case of Haiti (Ministry of Environment) and Jamaica (Fisheries Division/Ministry of Agriculture & Fisheries) weak governance led to major delays in project implementation and delivery of outputs in addition to limited

involvement of the Ministries, their agencies and agents. Regardless the challenges governments may have which lead to these problems, the message sent to the other stakeholders is that the issues are not important to government. This results in the users feeling they can get away with over-exploitation and the other stakeholders feeling disempowered.

- (ii) at the community level (particularly with mobilization and involvement of local community members) caused by non-existence of community-based organizations and limited capacity for the establishment and operation of such organizations. Participatory approaches and capacity building to enhance involvement of local community members is a long-term process requiring commitment in addition to skills and resources, but is critical for successful management and conservation of the living marine resources of the Caribbean.

Solving the challenge of weak governance will take time and requires work at all levels. Governments with help from international agencies and others can develop frameworks and policies to help guide a collaborative approach to management and conservation of living marine resources. Government agencies and Non-Government Organisations have key roles to play in building local capacity for involvement of local communities. To be effective, these processes will require support over the long-term.

Legislation was found to be a challenge in terms of enacting (or finalizing enactment) of Acts and regulations in a timely manner. There were also challenges in enforcing legislation whether due to challenges in catching offenders “red-handed”, the low level of fines, or the attitude of the judiciary to natural resources legislation offenders. A multi-pronged approach is required to solving these challenges including raising awareness and knowledge amongst resource users, enforcement officers and the judiciary.

3. BEST PRACTICES

3.1 Governance

Use of Participatory Approaches

In planning and implementation of project activities, community members and other stakeholders must be mobilized to meet around the particular issues of concern. This will require amongst other activities, stakeholder identification and analysis as for example in the Caracol Bay, Haiti Project, where FoProBiM identified stakeholders according to different uses of the area – salt, charcoal, fish and also by gender and geographic community. Through meetings and interviews they also obtained the perspectives of the different stakeholder groups regarding the challenges and possible solutions.

Management and conservation of resources using participatory and collaborative approaches usually requires the formation of committees and the holding of regular meetings. One danger that must be avoided is the establishment of too many committees and meeting for the sake of meeting. In the Caribbean there are only a limited number of persons available to attend these meetings and often too much time is spent on meetings and not enough time on implementation. All meetings must be geared towards monitoring progress on achievement of targets, following up/reporting on assigned responsibilities and finding ways for each organisation to play a role. This approach will ensure meetings are useful, contribute to the achievement of targets and objectives and maintain interest and motivation.

Building Local Community Capacity for Self-Organisation

Building capacity goes beyond involvement of the stakeholders and also beyond training but will require mentoring and other long-term, on-going processes working with individuals and organizations as they form. A most important form of capacity building is “learning by doing” or when more formalized “action learning” as the participants draw their own conclusions through practical, hands-on activities. Thus, community members and groups need to take responsibility for implementing and reporting on specific activities, which can increase in scope over time as their capacity is built and motivated by successes and by learning from mistakes. Careful supervision and support is needed for this.

Examples of this can be garnered from the Pedro Cays Project in Jamaica, where individuals e.g. fishers, have become more and more involved e.g. use of their boats and time, collecting information and samples. As their capacity has been strengthened through these practical activities and with training, they are moving towards taking on more responsibilities and the formation of organizations that will help improve local governance.

Lobbying Governments

Strong stakeholder groups can lobby governments for action. The critical factor, is to present a workable approach that benefits all the players. At the political level, there is concern about votes and not wanting to appear to be too harsh on poor constituents, therefore, these constituents have to be given voice so that they can require government to govern with a strong but fair hand. At the agency level, there is a need to better understand the benefits of shared responsibilities where there has been a tendency towards “turfism” where each agency “protects its own turf” and does not appear to want to liaise closely with other agency.

Enforcement of Legislation

Equity and transparency and other good governance principles must be adhered to in the enforcement of legislation, otherwise the power of the enforcement officers and judiciary will be undermined and illegal activities will increase. It is often not considered to be politically correct to punish low-income offenders for certain crimes but this attitude does not help low income communities whose situation is made worse by illegal fishing activities.

Enforcement of fisheries legislation does not have to depend on MPA and Fisheries Officers only, and the case of Pedro Cays shows how the military, whether Coast Guard or Navy, as well as Police Officers can be involved to increase efficiency and effectiveness. Several fishers became involved as community wardens because they saw the importance of protecting and careful management of the fisheries resources.

Partnerships and Collaboration

The reality within most countries around the world is that the relevant government agency does not have all the resources to address all the issues and further, that effective management of resources requires input from all stakeholders. The pilot projects in each of the countries showed how government, civil society and even private sector can work together to protect and manage shared resources.

3.2 Legislation

Education and Training

Public education is critical for raising awareness of the resource users at whom the legislation is targeted. They need to be aware of the legislation and ideally to understand the concepts and reasoning behind it, in order to promote compliance. The Enforcement Officers require the same public education in addition to training on the details of the legislation and how to apply it as well as how to employ enforcement methods. Every attempt should be made to encourage compliance with legislation and to support the Enforcement Officers. This was particularly evident in the Pedro Bank case e.g. the purchase of a boat engine to facilitate the repair of a boat formerly in use by the Jamaica Defence Force Coast Guard, which then enabled them to conduct patrols around the Cays.

Involvement of Community Members

Involving community members in enforcement and compliance is useful in building capacity and local support. Whilst they may not feel comfortable enforcing the law against their colleagues, they may be willing to do so when they understand the harm that can be done to their livelihoods. Again, this was the case in Pedro Bank, Jamaica where fishers have seen the degradation of the resources and want to help to restore the resources if possible.

Enforcement of Legislation

It is often said that the problem with legislation is not the lack of it, but rather the inadequacy of its enforcement. It is essential to enforce legislation otherwise it becomes easier for criminals to break the law and encourages others to do the same. Without enforcement, the law becomes a farce and illegal activities will escalate making it more difficult to stop later.

3.3 Marine Protected Areas

The Seaflower Marine Park provided the best examples of Marine Protected Area (MPA) practices such as:-

- Monitoring Programmes e.g. reef fish, beach
- Scientific and Research Programmes involving national and international groups
- Educational Programmes in schools and communities
- Restoration Programmes e.g. Queen Conch
- Addressing land-based pollution issues e.g. erosion control

This is because it is the longest existing MPA of the four pilot sites and has a strong management system in place. CORALINA is a local authority and so it is close to the issues and the stakeholders and can use this advantage to strengthen its management. In addition, the UNESCO Biosphere Reserve designation allows it to take advantage of international attention and support that may not be available to other sites.

The Pedro Bank site, through establishment of the South-west Cay Special Fishery Conservation Area exhibited best practices in the establishment of a MPA. Best practices were exhibited in planning and establishing the MPA and continued through in the implementation of conservation and management activities. Such practices included:-

- Preparation of a Management Plan – based on scientific studies and participatory approaches to involve stakeholders
- Awareness raising amongst stakeholders e.g. regarding legislation and about local flora and fauna
- Involvement of local community e.g. in scientific studies and conservation action

It is noteworthy that many conservation activities can be implemented without any legal designation but just with the support of interested stakeholders resulting from awareness raising e.g. the conservation of the Masked Boobies on Middle Cay. The issue of the conservation of these birds was raised during community outreach activities and management planning meetings. Interested community members talked to the researchers and assisted in the capture of the feral cats which were decimating the population. In addition, the community helped clean up the nesting site for the birds. All this resulted in a significant increase in survival rates in the following nesting season.

At Montecristi, the Ministry focused on building stakeholder awareness and involving stakeholders in planning so that the base for the next steps has been built, particularly with the Proposals for:

- Regulatory Framework for Fishing Activity
- Institutional Arrangement (and regulatory framework) for the Implementation and Enforcement of a Collaborative Participatory Management Plan

Despite the challenges faced by the Caracol Bay, Haiti Pilot Project, the foundation has been laid for strong community participation. As noted above, significant action can be achieved by interested stakeholders, without legislation, however the involvement of the government is necessary and will need to be addressed to ensure the success of future interventions.

4. SUMMARY & RECOMMENDATIONS

The CLME Management and Conservation of Reef Biodiversity and Fisheries Pilot Project was particularly useful as it involved four pilot projects with different governance approaches and at varying stages of management and conservation activities. Despite this, there were many similarities in the lessons learned and best practices exhibited, indicating that there are basic principles and approaches that are essential for successful management and conservation of reef biodiversity and associated fisheries. Key amongst these are:

- Good governance and the importance of stakeholder (including government) involvement and collaboration, clarification of roles and responsibilities and building capacity for effective management at all levels;
- The importance of community involvement and the need to ensure that the capacity for involvement is built and strengthened;
- The need for not just legislation, but awareness about it and the existence of trained enforcement officers and judiciary who understand not just the letter of the law but the reasoning behind it;
- The relevance of marine protected areas for conserving biodiversity and ensuring economically and socially sustainable livelihoods.

The information including the numerous project outputs e.g. videos, brochures etc. from the Pilot Project should be disseminated widely for greatest benefit nationally, regionally and internationally. Dissemination of information can be through websites e.g. those of the UN agencies and those of the partner organisations and also through presentations and seminars and conferences. The sites and the persons involved can all be used as resources for training and capacity building in the region. The work done at these sites should be built on, and the pilot project approach continued as the processes initiated require a long-term focus if the over-arching objective of the CLME Project is to be achieved.

The pilot projects will support the broader governance and policy level activities that are essential but which must be grounded in reality. Ongoing work at the pilot project sites will allow for testing of proposed governance frameworks and new strategies. A two-pronged approach which pairs policy making and operations allows for adaptive management which will help improve both policy and practice. For example, there is a need for the establishment of multi-agency committees with different agencies responsible for implementation of shared plans, and this approach needs to be monitored and evaluated to make improvements. The success of governance and policy level activities should be reflected in success at the operational level. Therefore, indicators should be identified at both levels for monitoring and evaluation.

The pilot project partners identified next steps and recommendations for approaches to follow on projects, which were highly recommended. In the case of the Seaflower – a MPA in existence since 2005, their main focus was to maintain and enhance existing activities such as monitoring and educational programmes. For Montecristi, Caracol and Pedro Cays where several new activities had just been initiated and plans made for action, the focus would be on implementation of these, particularly capacity building of local community members and ensuring their involvement in planning and action. Hence, the latter three sites and partner organisations had a sense of urgency to move ahead with plans and activities and were concerned about losing momentum.

In addition, a number of recommendations for approaches in the future were gleaned from the pilot project reports. These are highlighted in the table below, within the context of the Strategic Action Plan (SAP), specifically Strategy 4 and its associated activities. Strategy 4 is, “to enhance the governance arrangements for ecosystem-based management for reefs and associated ecosystems (e.g. sea grass beds, reef slopes, mangroves and coastal lagoons)”.

Table 6: Recommendations to strengthen SAP Strategy 4 Activities

	Activities for Strategy 4	Recommendations
4.1 (A)	Strengthen the formal cooperation between OSPESCA and CCAD for implementing the EBM/EAF approach	
4.2 (A)	Establish and/or enhance the cooperation between environmental, fisheries and other relevant agencies within CARICOM for implementing the EBM/EAF approach	Identify and implement actions to reduce government bureaucracy e.g. clarify the roles and responsibilities along with specific strategic actions required for relevant agencies for effective implementation of EBM/EAF
4.3 (B)	Establish and/or enhance the institutional structure and capacity of (sub-)regional and national arrangements for implementing management and conservation measures for reef ecosystems	Identify , convey and implement actions to reduce government bureaucracy and to bring stakeholders onboard Promote and reinforce decentralized governance structures with strong local stakeholder participation
4.4 (B)	Strengthen the capacity of Regional Fisheries Bodies to engage and build capacity among member States to implement the EBM/EAF approach, through National Action Plans (NAPs), data/information management and analysis, and operationalization of national inter-sectoral coordination and consultation mechanisms that include science-policy interfaces	Identify, convey and implement actions to reduce government bureaucracy and promote public sector/civil society/private sector partnerships Support the strengthening of relationships established between the pilot project partners
4.5 (B)	Operationalize and strengthen interlinked Decision Support Systems (DSSs) for the protection of reefs and associated ecosystems and for the sustainable management of associated living marine resources	Ensure adequate training for use of the systems and facilitate and or mandate the use of the systems in daily operations
4.6 (C)	Establish, strengthen and harmonize, (sub-) regional and/or fisheries-specific initiatives to combat IUU fishing by combining compliance measures (Monitoring Control and Surveillance plus awareness building among consumers & producers) with the provision of alternative livelihoods	Identify and implement actions to address: <ul style="list-style-type: none"> • government bureaucracy, • the issue of inadequate fines and enforcement officers/boats • challenges in the justice system Work with government and non-government organisations to address issue of alternative livelihoods including

	Activities for Strategy 4	Recommendations
		low levels of education and skills training in some of the fishing communities, which makes it difficult for youth to take advantage of alternatives to fishing. Also, raise the level of education and training of fishers to become more technical and sustainable.
4.7 (C)	Coordinate and enhance (sub-)regional and national efforts for the conservation of the biodiversity of reef and associated habitats, including through the strengthening of networks of marine protected areas (MPAs), and initiatives for sustainable reef fisheries* such as programmes dealing with alien invasive species	<p>Work with government and non-government organisations and existing CaMPAM Network</p> <p>Ensure strong environmental education and communication programmes</p> <p>Identify and implement actions to promote the institutional building of the stakeholders (fishers, middlemen and other CBO organizations) at the local level.</p> <p>Support efforts of pilot project partners to strengthen their programmes and to share with other (sub-) regional and national organisations</p>
4.8 (C)	Develop and implement initiatives for sustainable livelihoods by building capacity for diversification, fostering and facilitating viable alternative sources of Decent Work and/or improved incomes, and creating added value (e.g. through marketing and sales)	Work with government and non-government organisations to address issue of alternative livelihoods including low levels of education and skills training in some of the fishing communities, which makes it difficult for youth to take advantage of alternatives to fishing. Also, raise the level of education and training of fishers to become more technical and sustainable.

5. BACKGROUND INFORMATION

5.1 CLME Project Overview

The Caribbean Large Marine Ecosystem (CLME) Project was a five year (2009 – 2013) regional project valued at approximately US\$7 million and implemented through a partnership comprising:

- Funding Agency: Global Environment Facility (GEF)
- Executing Agency: United Nations (UNOPS)
- Implementing Agencies: United Nations Development Programme (UNDP) and the Inter-governmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organisation (IOC-UNESCO)

Goal: Sustainable provision of goods and services by the shared Living Marine Resources (LMR) in the Wider Caribbean Region through robust cooperative governance

Overall Objective: Sustainable management of the shared LMR of the Caribbean LME and adjacent areas through an integrated management approach that will meet the World Summit Sustainable Development Target for sustainable fisheries.

Specific Objectives:

- (i) To identify, analyse and agree upon major issues, root causes and actions required to achieve sustainable management of the shared LMR in the Caribbean
- (ii) To improve the shared knowledge base for sustainable use and management of transboundary LMR
- (iii) To implement legal, policy and institutional reforms to achieve sustainable transboundary LMR management
- (iv) To develop an institutional and procedural approach to LME level Monitoring, Evaluation and Reporting

5.1.1 Outputs/Outcomes

- (i) Identify, analyse and agree on major issues, root causes and action for sustainable management of the shared Caribbean LMR

The preparatory phase of the project began with the conducting of a preliminary Transboundary Diagnostic Analysis (TDA) which identified three priority trans-boundary problems that affect the CLME and Adjacent Regions:

- Unsustainable exploitation of fish and other living marine resources
- Habitat degradation and community modification
- Pollution

During the project, the TDA was updated using a Fisheries Ecosystem-based approach to analyse issues for the 3 key ecosystem types associated with the main fisheries in the WCR:

- Reef Ecosystems (including mangroves and sea-grasses)
- Pelagic Ecosystems
- Continental Shelf Ecosystems

The linkages between problems and their direct, intermediate and root causes were identified using Causal Chain Analyses (CCAs) and these formed a key component of the updated TDA, in addition to the consideration of governance and region specific issues. The TDAs and CCAs formed the technical and scientific basis for the definition and agreement of priority actions through the development and adoption of Strategic Action Programmes (SAP). The CLME SAP is a document that identifies the direction required for the Wider Caribbean Region to improve the management and governance of the region's shared living marine resources

(ii) Improved knowledge sharing

- Flying Fish Case Study

The flying fish fishery of the Eastern Caribbean is the single most important small pelagic fishery in the southern Lesser Antilles. It is of high social and economic significance to the seven countries which share the resource. The maximum total annual landings for these countries is 4,700 metric tonnes and is dominated by one of the 12 flying fish species – the four-winged flying fish (*Hirundichthys affinis*). The Case Study reviewed and completed the TDA for this fishery, providing information to develop a management and governance framework with priority actions for the fishery.

- Regional Workshop

A regional workshop, "Conservation, Fisheries Management Practices and Marine Protected Area Implementation Strategies in the Caribbean" was held in San Andres Island, Colombia from 23 – 25 April, 2012. This workshop was organised by UNEP CAR/RCU and involved 60 participants from the CLME Project and pilot projects, in addition to Colombian representatives from relevant organisations and projects. Its main purpose was to facilitate information sharing and knowledge transfer regarding best practices and lessons learned.

(iii) Legal, policy and institutional reforms

Weak governance was identified as a root cause of the failure to sustain provision of goods and services from marine ecosystems in the Wider Caribbean. The CLME Project built on the conceptual Governance Framework developed in the preparatory phase to prepare a report highlighting strengths and weaknesses of current governance and recommend options for regional governance of the CLME.

(iv) LME Monitoring, Evaluation and Reporting

The project established:-

- an integrated Information Management System (IMS) to provide a central repository for data and information to guide management; and
- a Regional Ecosystem Monitoring Programme (REMP) to provide a framework for periodic monitoring and evaluation of progress towards achievement of the Project goals and objectives.

(v) Pilot Projects

Management and Conservation of Reef biodiversity and fisheries

Reef ecosystems (and associated mangroves and sea-grass beds) are one of the three key ecosystem types associated with the main fisheries in the WCR. They are of critical importance not only to most fisheries but also tourism which is another industry major economic importance in the Caribbean. This project is described in more detail in the Introduction to this document.

Sub-regional Management of the Spiny Lobster Fisheries

The purpose of the project is to create implementable policy cycles at the local, national and subregional levels so as to establish a regular sub-regional management cycle for the spiny lobster stocks in the countries of the Central/South America Sub-region that utilizes the best available information from all sources, provides advice to a legitimate decision-making body, makes transparent decisions and implements them in timely fashion.

Specific objectives include:

- Identifying and engaging the full range of stakeholders in the fish chain in each stage of the cycle;
- Filling the gaps as identified in the different stages of the policy cycles at the local and national levels as being required to achieve ecosystem based management; and
- Enhancing linkages between the local and national level cycles with the sub-regional cycle.

5.2 Caribbean Environment Programme

The Reef Fisheries and Biodiversity Project was implemented by the United Nations Environment Programme (UNEP) Caribbean Regional Coordination Unit (CAR/RCU) from January, 2011 to June, 2012. The UNEP CAR/RCU was established in 1986 and is the Secretariat for the Caribbean Environment Programme (CEP), which is a sub-programme of UNEP's Regional Seas Programme. UNEP-CEP was established by Governments of the Wider Caribbean Region in 1986 and constitutes one of the eighteen (18) Regional Seas Programmes of UNEP across the globe. Its mission is to promote regional co-operation for the protection and sustainable development of the marine environment of the 38 member States and Territories that encompass this region and this is achieved through the implementation of activities that support the Cartagena Convention and its three Protocols.

The Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention, 1983) entered into force in 1986 and 25 Governments of 28 possible in the Wider Caribbean are Contracting Parties. The Cartagena Convention is supplemented by three (3) specific legal agreements:

- The Protocol Concerning Cooperation in Combating Oil Spills in the Wider Caribbean Region (Oils Spill Protocol, 1983);
- The Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol, 1990); and
- The Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol, 1999).

In response to the objectives of the Cartagena Convention and its Protocols, the CEP has three mutually supporting sub-programmes:

- Assessment and Management of Environmental Pollution (AMEP);
- Specially Protected Areas and Wildlife (SPAW); and

- Communication Education Training and Awareness (CETA).

The AMEP sub-programme provides regional co-ordination for the implementation of the LBS and Oil Spills Protocols. Additional technical support is provided by three (3) Regional Activity Centres (RACs): Centre of Engineering and Environmental Management of Coasts and Bays (CIMAB) in Cuba and the Institute of Marine Affairs (IMA) in Trinidad and Tobago for the LBS Protocol, and the Regional Marine Maritime Pollution Emergency Information and Training Centre (REMPEITC) in Curacao for the Oil Spills Protocol.

The goal of AMEP is to assist countries of the Wider Caribbean to control, prevent and reduce pollution of their coastal and marine environments thereby enabling them to meet their obligations under the LBS and Oil Spills Protocols of the Cartagena Convention.

The SPAW sub-programme provides regional co-ordination for the implementation of the SPAW Protocol with technical support is provided by the Regional Activity Centre in Guadeloupe (SPAW RAC) hosted by the Government of France . SPAW has established Memoranda of Cooperation with the Convention on Biological Diversity (CBD), the Ramsar Convention on wetlands, the Bonn Convention on migratory species, and the Interamerican Sea Turtle Convention (IAC) and also collaborates CITES, the International Coral Reef Initiative (ICRI) and many other global and regional conservation programmes.

The CETA sub-programme provides assistance to the sub-programmes of CEP through the development of mechanisms to disseminate information and through the development promotional materials relevant to the implementation of the Cartagena Convention and its Protocols.

The SPAW Protocol has established a Scientific and Technical Advisory Committee (STAC) to address issues and identify priorities regarding Protocol implementation which meets biannually with the meetings of the Parties. The Protocol's objectives are to conserve and sustainably manage the marine biodiversity of the WCR through the protection of threatened and endangered species and their habitats and related ecosystems. This objective is met by working with governments within the region to establish and properly manage protected areas, manage and use species sustainably and the coastal ecosystems. The Caribbean Environment Programme aims to promote regional co-operation for the protection and sustainable development of the marine environment of the wider Caribbean Region. As the Secretariat of the CEP, the CAR/RCU provides assistance to all countries of the region, strengthens national and sub-regional institutions, coordinates international assistance and stimulates technical cooperation among the countries of the region. The CEP has three main sub-programmes:

- Assessment and Management of Environmental Pollution
- Communication, Education, Training and Awareness
- Specially Protected Areas and Wildlife (SPAW):-
 - Strengthening and Management of Protected Areas in the Wider Caribbean Region
 - Development of Guidelines for the Management of Protected Areas and Species
 - Conservation of Threatened and Endangered Species
 - Conservation and Sustainable Use of Marine and Coastal Ecosystems

Participation in the CLME Project, and specifically, management of the Reef Biodiversity and Fisheries Pilot Project is one of the major, current activities of the SPAW Programme.

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Terminal Report: Management and Conservation of Reef Biodiversity and Reef Fisheries Pilot Project, Caracol Bay, Haiti. FoProBiM.

Terminal Report: Management and Conservation of Reef Biodiversity and Reef Fisheries Pilot Project – Pedro Bank. The Nature Conservancy.

Terminal Report: Management and Conservation of Reef Biodiversity and Reef Fisheries Pilot Project – SeaFlower Marine Protected Area. CORALINA.

Table 7: Document Internet References

Site	Description	Type	Weblink
UNEP CEP Files	UNEP-CEP CLME Project Fact Sheet - English	Document	http://www.cep.unep.org/about-cep/spaw/conservation-and-sustainable-use-of-marine-and-coastal-ecosystems/Factsheet%20CLME%20Reef%20Pilot%20Project%2003-10-10%20EN.pdf/view
	UNEP-CEP CLME Project Fact Sheet - Spanish	Document	http://www.cep.unep.org/about-cep/spaw/conservation-and-sustainable-use-of-marine-and-coastal-ecosystems/Factsheet%20CLME%20Reef%20Pilot%20Project%2003-10-10%20SP.pdf/at_download/file
	TNC Pedro Bank Fact Sheet	Document	http://www.cep.unep.org/about-cep/spaw/conservation-and-sustainable-use-of-marine-and-coastal-ecosystems/TNC%20Pedro%20Bank%20Fact%20Sheet%20FINAL.pdf/at_download/file
	CORALINA Seaflower Fact Sheet	Document	http://www.cep.unep.org/about-cep/spaw/conservation-and-sustainable-use-of-marine-and-coastal-ecosystems/CORALINA%20Seaflower%20Fact%20Sheet%20FINAL.pdf/at_download/file
	Fact Sheet Montecristi DR	Document	http://www.cep.unep.org/about-cep/spaw/conservation-and-sustainable-use-of-marine-and-coastal-ecosystems/Fact%20Sheet%20Montecristi%20DR%20FINAL.pdf/at_download/file
Colombia Seaflower files	CORALINA PR Material (photos, mascots)	Document	https://www.dropbox.com/sh/nmqziso6hifaqfl/YTAK7Diyba
	Spiny Lobster brochure	Document	https://www.dropbox.com/s/k0wynikqx5t1kbu/folletos_Langosta%20Espinosa.pdf
	Spiny Lobster Presentation	Document	https://www.dropbox.com/s/ztvr9lqwu0gper4/Presentaci%C3%B3n%20Langosta-CLMEr.pdf
	Spiny Lobster - Technical Recommendations	Document	https://www.dropbox.com/s/tnzb3ruo0rzbqyk/recomendacion%20t%C3%A9cnica%20langosta%202011f.pdf
	Spiny Lobster workshop reports	Document	https://www.dropbox.com/s/3zhctafjpo8semr/taller%20usuarios%20langosta%202011-SAI.pdf
		Document	https://www.dropbox.com/s/90ozf51cpzf09qc/Memoria%20Taller%20Langosta%20Espinosa.pdf
	Lobster Fishing Certification report	Document	https://www.dropbox.com/s/zlb36t5xd8jaxz6/Lobster%20certification%20San%20Andres.pdf
	Lionfish brochure	Document	https://www.dropbox.com/s/5s7l5m84s4ug0cx/folletos_Pez%20Leon.pdf
	Lionfish Presentation	Document	https://www.dropbox.com/s/rta7xort7uedyo0/Presentaci%C3%B3n%20Pez%20Leon.pdf

Site	Description	Type	Weblink
	Shark brochure	Document	https://www.dropbox.com/s/mlgsgvx2ti6f5k3/folletos_Tiburon.pdf
	Shark Presentation	Document	https://www.dropbox.com/s/km1ak5os9ov3hln/Presentaci%C3%B3n%20Tiburon.pdf
	Key Species ducational Package	Document	https://www.dropbox.com/s/iwlg31hmserzyj/key%20species%20educational%20package%20low%20resolution.pdf
	Module on Queen Conch	Document	https://www.dropbox.com/s/87213cek6dkz0ac/Modulo%20Caracol%20Pala%20_low%20resolution.pdf
	Seaflower MPA Presentation to NOAA	Document	https://www.dropbox.com/s/2091imvtn3bvo78/Seaflower%20CORALINA%20-%20NOAA%2024.0.pdf
	Queen Conch Expert Workshop Report	Document	https://www.dropbox.com/s/2lbqr2fgg35gcdc/Queen%20Conch%20Expert%20Workshop.pdf
	Erosion Control Report	Document	https://www.dropbox.com/s/diq1fh6n9vpikxn/erosion%20control%20low%20resolution-.pdf
	Risk Analysis Report	Document	https://www.dropbox.com/sh/hef3u3i8twqua54/uXLz0n5Ock
Pedro Bank Files	Conservation Measures Framework and Monitoring and Evaluation Plan for Pedro Bank Management Programme	Document	https://www.dropbox.com/s/ys5sqbktbc989ni/Conservation%20Measures%20Framework%20-%20CLME%20Project%20-%20Fi
	Pedro Cays & Surrounding Mgt Plan	Document	https://www.dropbox.com/s/qf8fu68xdjh73ws/Pedro%20Cays%20and%20Surrounding%20Water%20Management%20Plan_Fel
	Living Oceans Foundation Field Report_March2012	Document	https://www.dropbox.com/s/szq970rb2jt8ttk/Rpt%20on%20LOF%20Trip%20-%20Field%20and%20Outreach%20activities.pdf

<u>Site</u>	<u>Description</u>	<u>Type</u>	<u>Weblink</u>
	Report on Movement Patterns of Masked Booby (Sula dactylatra) breeding on Pedro Cays	Document	https://www.dropbox.com/s/4vtl8t705jqksot/Masked%20Booby%20Report_Pedro%20Aug2012.pdf
	Buoy Deployment Report	Document	https://www.dropbox.com/s/9w285qz3noqg4e7/Buoy%20Deployment%20Report%20-%20November%202012.pdf
	Beach Cleanup Report Pedro Bank_Sept 2012	Document	https://www.dropbox.com/s/x0un3a7vj844rrr/Summary%20of%20Beach%20Cleanup%20Activities%20on%20Middle%20Cay%20Sept.%202012.pdf
	Protecting Pedro-South West Cay Fish Sanctuary	Video	http://www.youtube.com/watch?v=HK1MHFgtMwU
	Protecting Pedro-Building Conservation Capacity	Video	http://www.youtube.com/watch?v=R8Xmfvm1QvY
Montecristi files	Technical Report of flora and vegetation of the coastal area of Montecristi .	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Paginas/Productos.aspx#descr
	Evaluation of Coastal Lagoons in the province of Montecristi	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/Evaluacion-Lagunas-Costeras-Provincia-Montecristi-del-Marco-Proyecto-CLME.pdf
	Characterization of the Rocky Coast of the province of Montecristi	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/INFORME-VISITA-CARACTERIZACION-COSTA-ROCCO-DE-MARCO-PROYECTO-CLME-REALIZADO-PROVINCIA-MONTECRISTI.pdf

Site	Description	Type	Weblink
	Marine Expedition to Montecristi to know the current status of the reefs in the Province	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/INFORME-PRELIMINAR-EXPEDICION-MARINA-MONTECRISTI-CONOCER-ESTADO-ACTUAL-ARRECIFES-PROVINCIA.pdf
	Compilation of Legal Documentation (National and International) relating to the regulation of fishing activity in the Dominican Republic	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/Compilacion-Legislacion-Nacional-Internacional.p
	Workshop with representatives of fishing groups Montecristi	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/Informe-Taller-Grupos-pescadores-Montecristi.po
	Workshop with governing fishing Institutions of Montecristi	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/Informe-Taller-Autoridades-Montecristi.pdf
	Workshop with representatives of civil society groups of Montecristi .	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/Informe-Taller-sociedad-Civil-Montecristi.pdf
	Workshop with Neighborhood Associations of Montecristi.	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/Informe-Taller-Juntas-Vecinos.pdf

Site	Description	Type	Weblink
	Diagnosis of Natural and Social Situation of the Marine and Coastal Area of the province of Montecristi.	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/Diagnostico-CLME-Montecristi.pdf
	Governance of fisheries in the province of Montecristi .	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/Analisis-gobernanza-pesca-en-Provincia-Montecristi.pdf
	Initial Presentation CLME August 2010	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/Presentacion-Inicial-Proyecto-CLME-Agosto2010.pdf
	Vice Montecristi Induction CLME Coastal and Marine	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/CLME-Montecristi-Induccion-Manzanillo.pdf
	CLME Montecristi Induction in Manzanillo	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/CLME-Montecristi-Induccion-Manzanillo.pdf
	Compilation Montecristi CLME Legislation	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/CLME-Montecristi-Compilacion-Legislacion.pdf
	Montecristi CLME Diagnosis and Plan	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/CLME-Montecristi-Diagnostico-Plan.pdf
	Montecristi CLME Progress and challenges	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/CLME-Montecristi-Avances-retos.pdf
	Montecristi CLME Regional Workshop Experience Sharing San Andres Colombia	Document	http://www.medioambiente.gov.do/Ministerio/CosterosMarinos/Documents/CLME-Montecristi-Taller-regional-Intercambio-Experiencias-San-Andres-Colombia.pdf

<u>Site</u>	<u>Description</u>	<u>Type</u>	<u>Weblink</u>
Haiti files	Review of Fisheries Laws - Haiti	Document	https://www.dropbox.com/s/pyo24xv3s75c8db/Fisheries%20Laws%20Haiti%20FoProBiM.pdf
	Gap Analysis for Marine Protected Areas - Haiti	Document	https://www.dropbox.com/s/pc4dhveukyothid/Gap%20Analysis%20for%20MPAs%20in%20Haiti.pdf
	Flyer on importance of Mangroves - Haiti	Document	https://www.dropbox.com/s/7ae2ifsx59929py/Mangrove%20Pamphlet.pdf
	Report of Montecristi/Caracol Joint Meeting	Document	https://www.dropbox.com/s/kyx8ry5787zm7he/Report%20%20Caracol%20meeting.pdf