

Management and Conservation of Reef Biodiversity and Reef Fisheries: A Successful CLME Pilot Project in the Seaflower MPA

Manejo y Conservación de la Biodiversidad en los Corales y su Biodiversidad Asociada: Un proyecto piloto exitoso de CLME en el AMP Seaflower

Projet Pilote Gestion et Conservation de la Biodiversité Récifale et des Pêcheries De Récifs : Un Projet Pilote Réussi du CLME dans L'AMP de Seaflower

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ABSTRACT

During 1.5 years, CORALINA conducted five major activities in order to maintain the coral reef biodiversity and its long-term productivity as outlined within the reef fish and biodiversity CLME pilot project, under the coordination of UNEP office in Jamaica.

The first activity focused on the strengthening of *Integrated Ecosystem Based Management* by conducting three scientific expeditions articulating the collaborative work and support from more than five organizations. The expeditions provided information needed to better understand the reef complexity and its application in the integrated resource management.

The second activity looked at the strengthening of collaborative enforcement mechanisms done by analyzing current fishing regulations and by training authorities and stakeholders in EBM and reef fish conservation; by seeking voluntary compliance through greater and more practical education and training; and by developing more collaborative inter-institutional work regarding enforcement and surveillance.

Public awareness, education, and outreach were the focus of the third activity. Formal lessons and educational packages on key MPA species such as spiny lobster, queen conch, snappers, sharks, parrot fishes, and lion fish were generated. To complete this cycle, a regional “exchange of lessons learned” we organized with the participation of people from San Pedro Bank, Jamaica, the Haiti-Dominican Republic northern transboundary area, and Grenada, beside a broad participation from Colombia.

Best Management Practices, the fifth activity, were demonstrated by building, deploying, and monitoring six modules made of empty queen conch shells with the participation of artisanal fishermen and the overall objective of increasing reef fish recruitment in the South-South-West atoll.

KEY WORDS: Seaflower MPA, CLME pilot project, reef biodiversity

INTRODUCTION

The Caribbean large Marine Ecosystem Project, commonly known as the CLME project, is a five year project (2009-2013) formulated 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 effective management of coral reefs and their associated coral reefs in the region are essential to the fisheries and tourism sectors. The economies of many countries within the region depend on coral reefs. It is estimated that in the Bahamas, marine resources contribute US \$2.7billion through tourism and the harvest of marine resources.

The CLME produced a Transboundary Diagnostic Analysis (TDA), identifying three priority problems across the region:

- i) Unsustainable exploitation of fish and other living marine resources,
- ii) Habitat degradation and community modification, and
- iii) Pollution.

In response to the TDA, the CLEM project also produced a Strategic Action Programme (SAP), documenting the shared, and commonly-agreed upon vision of the countries participating in the CLME Project with regard to the priority interventions, reforms, and investments that are required to ensure the sustainable provision of goods and services from living marine resources in the Wider Caribbean. More specifically, the CLME Project is looking at the strengthening of the governance of key fishery ecosystems at the regional, sub-regional, and national levels.

This strengthening of the governance of key fishery ecosystems was examined in detail through four pilot projects, from which we are presenting the results of the Management and Conservation of the Reef Fish and Biodiversity within the Seaflower MPA, Colombia. Partners in this pilot project were also Jamaica and Dominican Republic.

This pilot project focused on improving enforcement practices and adaptive, ecosystem-based management in the Seaflower MPA in order to maintain its coral reef biodiversity and long-term productivity. Through this project, CORALINA strengthened the ecosystem-based approach towards better conservation and effective management of coral reef ecosystems and their associated resources, including the reef fishery resources. The improvement of resource management, better enforcement mechanisms intense educational activities in compliance with different sectors of the community helped to enhance governance by building capacity, sharing, and adapting best practices learnt at local, national, and across the region.

The Reef Fisheries and Biodiversity Project Pilot Project was valued at US\$1.155 million for implementation by the United Nations Environment Programme (UNEP) Caribbean Regional Coordination Unit (CAR/RCU) from January, 2011 - June, 2013.

RESULTS

The first activity developed “Strengthening of Integrated Ecosystem Based Management” was expected to generate scientific information needed to improve integrated resource management, better value ecosystem services and goods, thus applying holistic criteria, and not only focusing on single species. During its implementation CORALINA and its local, national and international partners successfully conducted three scientific expeditions at the remote and productive northern atolls of the archipelago (Figure 1). Two of them conducted at Quitasueño, Serrana, and Roncador took data on the algal, community, queen conch population status to determine its level of fishing, and actualize data on the coral reef structure and composition. The third expedition was arranged with the Global Reef Expedition by the Khaled Bin Sultan Living Oceans Foundation. In addition, coral reefs, reef fishes, and queen conch improvements on the habitat mapping is being produced.

Data obtained through scientific expeditions are utilized to generate management recommendations which are later validated with stakeholders prior to final decisions, a process that is nowadays regionally recognized, as valid and important examples about how to include sustainability principles into local and national marine resources management. In this regard, follow-up meetings and forums are considered important to maintain communication channels and to define management actions and the necessary alliances they require.



Figure 1. Underwater pictures taken during the Global Reef Expedition conducted at the most northern archipelago atolls.

Works on islands watersheds were also part of this activity. The CLME pilot project support actions in the Gammadith gully, Providence Island, such as gully cleaning, and establishment of hard structures to reduce soil erosion. These action were conducted in close collaboration with the Fund for Biodiversity and Protected Areas and the organization Patrimonio Natural.

With the project second activity “Strengthen Collaborative Enforcement Mechanisms, Analysis of Fishing Regulations and New Fishery Regulations in Place” there were three main outputs were completed, as follow:

- i) Analysis of the existing policy, legal, and regulatory framework related to fisheries,
- ii) Training of authorities and stakeholders in EBM and reef fish conservation Workshops (Figure 2), and
- iii) New regulations to improve reef fish conservation in Seaflower in place.

These activities were expected to contribute to the improvement of participative fisheries management regulations and consequently to the reduction of illegal fishing. In the same sense, efforts have been made towards the improvement in the planning of enforcement activities within the Seaflower MPA.



Figure 2. Special meetings and workshops.

The following can be highlighted as the main issues towards improvement of the enforcement and surveillance within the Seaflower MPA.

- i) Seek voluntary compliance through greater and more practical education and training. This work should be able to constitute a formal citizen voluntarily group that support CORALINA in enforcement several management regulations, or increase the number of complains.
- ii) Be able to maintain the presence on the managed area, including terrestrial, marine or aerial patrolling coordinated agendas. Develop special agreements for special times or events, or common violators.
- iii) Define realistic, precise, and clear objectives that would allow improving public perception about the success of enforcement and surveillance activities.
- iv) Education should focus on key species, making available to the general public their basic bio-

- ecological characteristics, their role in the ecosystem, and why the regulation is in place.
- v) Develop more collaborative inter-institutional work regarding enforcement and surveillance, involving uniform and armed personnel, along with agencies personnel and members of the local community.
 - vi) Develop a penalties or fees schedules accordingly with the type of infraction.
 - vii) Provide professional and standardized training to the military personnel in an effective way, counteracting high rotational scheme they regularly manage.
 - viii) Define indicators to be able to measure the effectiveness of patrolling, infractions, inspections, or any action related to the enforcement and surveillance.
 - ix) Improve technology dedicated to the enforcement personnel in general. That refers for instance to VMS (vessel monitoring systems), EMS (electronic monitoring system), electronic log-books, AIS (automatic identification system), LRIT (long range identification and tracking), radar imaging system, optical imaging system, and integrated sensor systems among others.

On the third project activity, “Public Awareness, Education, and Outreach” four main outputs from which CORALINA significantly exceeded all of them. Educational activities focused on key species that were both, identified important for the evaluation Seaflower Marine Protected Area (MPA) performance and important as fisheries stocks, and reached the entire representation of our local community. Every week between September and November, two

hour talks were given to students from third to fifth grades, to more than 500 students and 12 teachers (Figure 3). During the talks emphasis was made on the importance of protecting not only the coral reefs, but also the connecting seagrass beds and mangroves ecosystems which are vital for the conservation of the entire reef biodiversity and its ecological and economical importance. Students shared experiences and frequently asked questions related to the maximum size, predators, and the number of eggs that females can carry. To complement the educational activities, an educational package with information about five key species/group of species, along with seven video-clips and an update of the queen conch curriculum were produced (Figure 4). Again, inter-institutional collaborative work helped to significantly improve the different educational activities. A total of 20 MPA signs and a high quality MPA video, door-to-door campaigns, and shark play were also outputs of the educational component in this project.

With the four project activity “exchange of lessons learned” CORALINA was able to plan and organize a four days regional workshop, last 23-25 April 2012 in San Andres Island, Colombia. The workshop was attended by the coordinators, staff and experts of the CLME project as well as representatives of the three pilot projects of the Biodiversity and Reef Fisheries Management subproject, which takes place in 3 sites: San Andres, Colombia; San Pedro Bank, Jamaica; and Haiti-Dominican Republic northern transboundary area (Figure 4). In addition, and taking the advantage of similar activities planned by other international projects, representatives of three regional projects relevant to marine conservation and marine resource sustainability were invited to make presentations and participate in the discussions.



Figure 3. Pictures showing results from educational activities developed with the CLME pilot project.

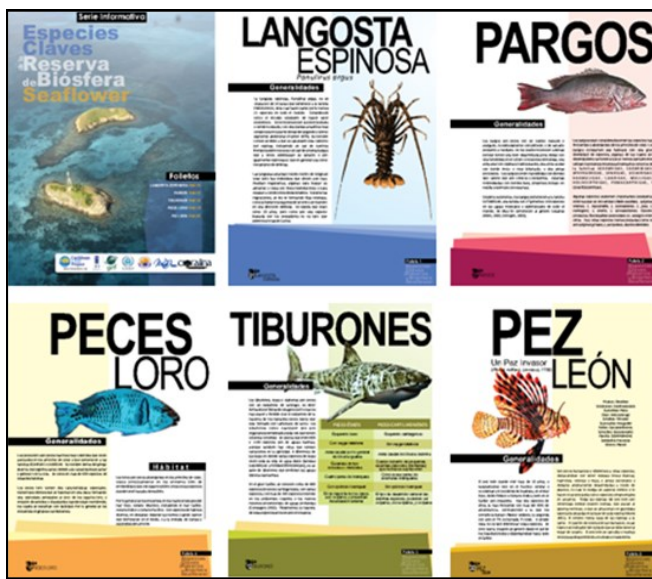


Figure 4. Example of the educational package generated with the CLME pilot project.

The projects involved were:

- i) GEF /IADB PROJECT “Protecting Biodiversity in the Southwestern Caribbean Sea”,
- ii) GEF/PNUD project “Designing and Implementing a National Sub-System of Marine Protected Areas (SMPA) in Colombia”, and
- iii) UNEP-CEP project funded by the Directorate General for Development Cooperation of the Italian Ministry of Foreign Affairs entitled: "Regional support for the Caribbean Challenge initiative: Networking, consolidation and regional coordination of MPA management".

The last project activity “Adaptive Management Improved through the Introduction of Best Management Prac-

tices” developed several actions, including a fish recovery pilot project in the South-South-West atoll, in which six structures made of empty queen conch shells were installed and monitored, with excellent results (Figure 5). CORALINA was able to get additional funding from the national government to scale up the outputs from this project in 2013. Active participation of artisanal fishermen in this activity and change their attitude in regard to implementing good actions within the Seaflower MPA.

Due to successful results of this pilot project, the fishermen support there were additional workshops, planning meetings and some training needed to scale-up the results from pilot project, thus at the end of 2013 there will be 42 structures on place functioning in conjunction as available habitat for increasing reef fish recruitment in this atoll.

CORALINA participated and collaborated with additional CLME activities by participating in steering committee meetings, reviewing various versions of the “Regional Transboundary Diagnostic Analysis” and a preliminary version of the “Strategic Action Plan”. We also helped the international advisor, Dr. Robin Mahon, in his governance analysis, for which we conducted three meetings, two at local level and one at national level.

Unfortunately, with the final decision of the International Court of Justice emitted last November 19, 2012 a new Colombia-Nicaragua maritime frontiers has been set, a decision that instead of solving decades of disputes, actually generated more conflicts. It is too soon to evaluate the consequences of this decision in terms of the region governance and the sustainable policies in place in this transboundary area.

CONCLUSIONS

The CLME pilot project executed by CORALINA was highly productive and reached the entire representation of our local community. It generated products that can be utilized long after the project ends and awaked emotions,



Figure 5. Images from the international workshop for experiences exchanges within CLME partners.



Figure 6. Pictures from various activities conducted under adaptive management project component.

knowledge and thoughts needed to continue the conservation and sustainable policies and regulations within the Seaflower MPA marine resources, including those subjected to fishing.

Data analysis done quickly, with quality control procedures and international advisors, generated the scientific bases needed for adjust or implement management policies and regulations. The validated decisions with stakeholders are nowadays regionally recognized, as valid and important examples about to include sustainability principles into local and national marine resources management.

Inter-institutional collaboration was also significantly improved by planning and conducting so many different educational activities. Among the enhanced partnerships regarding educational components are the ones developed with AUNAP, National University, SENA students, school teachers and coordinators, and local artists. The excellent collaboration and good feeling regarding the environmental education programs is highly valued.

GEF promotes international cooperation, solutions sharing to increase impact, and capacity building, which were all achieved by CORALINA. However, there was little communication with other partners within this pilot project or with people from other pilot projects. Considering that practical solutions can be seen easily through the pilot projects, there is need for broader communication and interaction among several partners on a regional basis.

The recent decision of the International Court addressing the dispute between Colombia and Nicaragua happened at the of the project, and created more conflicts that previously envisioned, thus governance analysis need more work, and perhaps international mediation, in order to keep resource sustainable use of coral reef biodiversity.

RECOMMENDATIONS

- i) It is important to continue the educational process now that schools have opened spaces to interact with CORALINA's programs and projects. The public awareness and education can advance if more schools apply these experiences.
- ii) Follow up meetings and forums are important to maintain communication channels and to define management actions and necessary alliances they require.
- iii) Considering the high motivation sensed during the field trips, it is important to do more field trips and practical lessons in order to maintain students and teachers motivation, although some improve in the logistics it might be necessary.
- iv) It is important to continue the partnership with several institutions and even try to integrate others such as the Secretariat of Education in order to guaranty the implementation of the Conch Curriculum and other educational activities still planned in the project.
- v) During the exchange workshop there were restoration and monitoring activities highlighted as basis for further cooperation, in particular when working on remote areas, including those with multinational fisheries jurisdiction. These actions should be follow-up.
- vi) It is necessary and important to continue strengthen all the environmental educational process, needed to change people's behaviors towards a sustainable use of the Seaflower Biosphere Reserve resources.