Combined Biophysical and SocMon Report of the GCRMN-Caribbean Capacity Building for Coral Reef and Human Dimensions Monitoring within the Wider Caribbean Workshop

10-14 October 2017 – Port Royal Marine Laboratory – UWI, Kingston, Jamaica

GCRMN

CARIBBEAN

CAR·SPAW·RAC CARAIBE

CARIBBEAN ENVIRONMENT PROGRAMME

UN environment
United Nations Environment Programme

CERMES UWI

SOCMON

NATIONAL FISH AND WILDLIFE FOUNDATION
NFWF

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOAA
U.S. DEPARTMENT OF COMMERCE

NOAA CORAL REEF CONSERVATION PROGRAM

USB

WAITT INSTITUTE

nepa
National Environment and Planning Agency

Centro Nacional de Areas Protegidas
CNAP

ICRI
INTERNATIONAL CORAL REEF INITIATIVE

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I. Introduction

• The GCRMN

The **Global Coral Reef Monitoring Network** (GCRMN) was established to support the **International Coral Reef Initiative** (ICRI)'s Call to Action and Framework for Action in **1994**. This network works through **regional networks**, comprising a variety of **institutions**, with the aim of **strengthening the provision of the best available scientific information and communication on the status and trends of coral reef ecosystems, for their conservation and management**.

• The GCRMN regional network for the Caribbean region

To address the findings of the join UN Environment- IUCN (International Union for Conservation of Nature) GCRMN report on the Status and Trends of the Caribbean Coral Reefs, CEP/SPAW-RAC and the Dutch Ministry of Economic Affairs organized a workshop (6-8 August 2014) in Curaçao, with the objectives of "**Reviewing, improving and revitalizing the network and the nodes for a more effective coral reef monitoring and data management**"[1].

The regional GCRMN network for the Caribbean region ("GCRMN-Caribbean") is nowadays an **open and growing network of coral reef scientists and managers involved with coral reef monitoring in the Wider Caribbean**. Coordinated by the UN-Environment - Caribbean Environment Programme (**UN Environment-CEP**) and its Regional Activity Center for the Protocol Concerning Specially Protected Areas and Wildlife for the Wider Caribbean Region (**SPAW-RAC**), it is led by a **Steering Committee** composed of a fifteen regional experts, assisted by **Members-at-large**. Currently, **more than 150 Members** are sharing experiences, information and knowledge within this network.

• The GCRMN-Caribbean Biophysical and Socio-economic Guidelines on coral reef monitoring

Long-term, robust coral reef monitoring coupled with strategic reporting are essential drivers for **ecosystem-based management** and **regional policy processes**.

To this end, the GCRMN-Caribbean published minimum as well as **preferred coral reef monitoring guidelines for ecological and socio-economic data collection**, to be disseminated within the Caribbean region (the "GCRMN-Caribbean Monitoring Guidelines for Biophysical Monitoring" and the "GCRMN-Caribbean Guidelines for Integrated Coral Reef Monitoring"). These guidelines were drafted using the experience and lessons learned from long term and well vetted scientific protocols, and seek to provide a compromise between practical applicability and ease of comparison between existing methods and long-term data sets.

Both guidelines provide a **multi-level framework for existing and developing monitoring programmes** to contribute data that support a **regional understanding of status and trends of Caribbean coral reefs** which will help guide **management** and **decision-making**.

1 UN-Environment/SPAW-RAC/Ministry of Economic Affairs of the Netherlands [2014]. Report of the Workshop of GCRMN for the Wider Caribbean: Review, improve and revitalize the network and the nodes for more effective coral reef monitoring and data management, Curaçao, 6-8 August 2014

Of particular importance, the GCRMN-Caribbean seeks to help **reinforce existing national coral reef monitoring programmes** and to support the **development of new ones** where needed. Caribbean Governments are invited to take part in this regional effort, by encouraging their relevant Departments and partners to use the GCRMN-Caribbean monitoring guidelines, as well as to request assistance and support from this expert network at their convenience.

- ## The GCRMN-Caribbean capacity building workshops: the "GCRMN-Caribbean Capacity Building for Coral Reef and Human Dimensions Monitoring within the Wider Caribbean"

In this context, UN Environment-CEP/SPAW-RAC coordinated the first GCRMN-Caribbean Integrated Coral Reef Monitoring Workshop[2] (Discover Bay Marine Laboratory, Jamaica, April 2016). The scientific capacity building event, "**GCRMN-Caribbean Guidelines Capacity Building Workshop: Towards comprehensive coral reef monitoring**" integrated the **newly endorsed Biophysical and Socio-economic Guidelines** to the training programmes. The participants were invited in the training through the nomination by national management authorities of suitably committed **Marine Protected Area and coastal resource managers**, **coral reef monitoring practitioners and conservationists** as well as representatives from **local research centres and universities**.

Subsequently, another training workshop was implemented by the GCRMN-Caribbean (Port Royal Marine Laboratory, Jamaica, October 2017), entitled "**GCRMN-Caribbean Capacity Building for Coral Reef and Human Dimensions Monitoring within the Wider Caribbean**", which trained 16 participants to improve coral reef monitoring as well as regional cooperation and information sharing[3]. Expected training outcomes included a better understanding of difficulties that may be encountered in making decisions using socio-economic and biophysical data, and **enhanced the use of data for decision-making and adaptive management**.

Fourteen participants from Jamaica (from the **National Environment and Planning Agency**, the **Centre for Marine Sciences** and the **Port Royal Marine Laboratory**) attended this workshop; two Cuban participants from the **Cuban National Center of Protected Areas** (CNAP) were also invited to join.

Participants in the **biophysical component** of the workshop were highly experienced in coral reef monitoring, and after a brief review of the GCRMN-Caribbean methodology and a reconnaissance dive, they were able to immediately conduct a **complete site assessment of the Palisadoes Port Royal Protected Area (P-PRPA) reefs**. The benthic, fish, invertebrate, coral recruits, and water quality data were collected from nine sites within the Port Royal Cays. These data were then sorted and compiled into excel data sheets for subsequent analysis.

The participants of the socioeconomic component of the workshop were introduced to the **Socio-economic Monitoring for Coastal Management** (SocMon). During the week, participants developed draft socio-economic site monitoring plans for their sites of interest (P-PRPA for the Jamaican and Isla de la Juventud, Cuba for the Cuban participants) and also

2 UN Environment/SPAW-RAC [2016]. First GCRMN-Caribbean integrated coral reef monitoring workshop in Jamaica, April 2016. [online] Available at http://www.car-spaw-rac.org/?First-GCRMN-Caribbean-integrated,665

3 ICRI [2017]. Global Coral Reef Monitoring Network for the Caribbean trained 16 participants in Coral Reef and Human Dimensions Monitoring during Workshop in Jamaica [online] Available at https://www.icriforum.org/news/2017/10/global-coral-reef-monitoring-network-caribbean-trained-16-participants-coral-reef-and-h

shared experience and materials from their own countries. Subsequent to the workshop, the SocMon teams will refine and finalize the draft **site monitoring plans for initiation of socio-economic monitoring**.

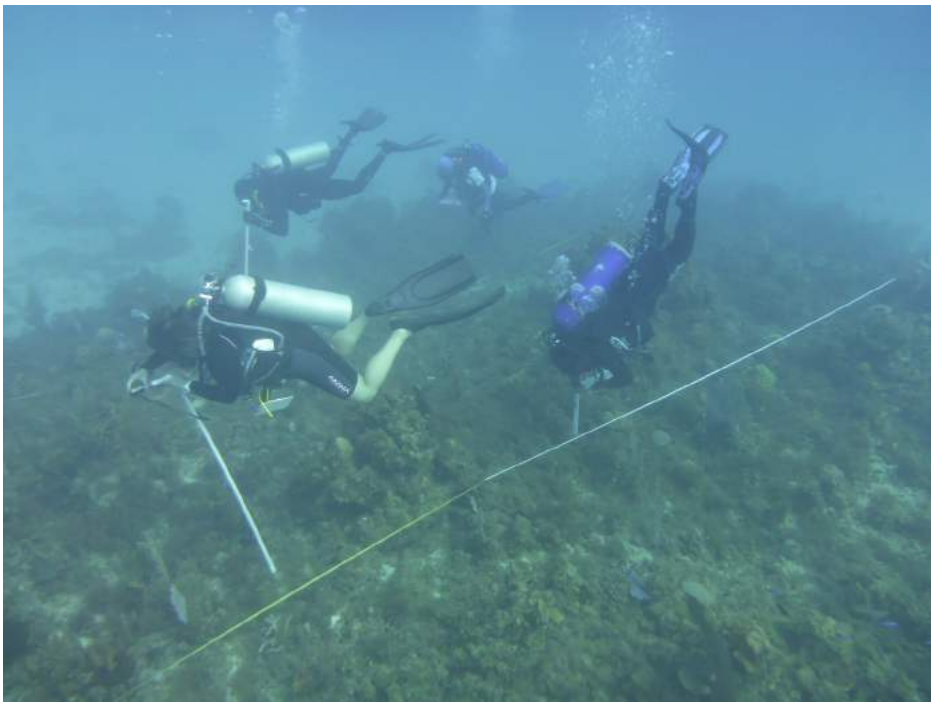
This workshop has mainly been funded by the **Coral Reef Conservation Fund** of the **National Fish and Wildlife Foundation** (NFWF), in the framework of project 52776, entitled « **Building Capacity for Coral Reef and Human Dimensions Monitoring within the Wider Caribbean** ». This grant implements a workshop-based training program to increase regional capacity for bio-physical and socio-economic monitoring in the Caribbean.

As a follow-up to the workshop, a NFWF small grant of approximately USD 3,000 allocated between biophysical and socio-economic monitoring activities based on capacity and resource needs will be awarded to the project partner in Jamaica to support analysis of **biophysical data (including photo images) and a socio-economic assessment at the P-PRPA**.

Finally, a second **NFWF-funded workshop** will be held in Saint Martin in 2018, and will train participants from **Saint Martin, Sint Marteen, Saba, Sint Eustatius, and Saint Barthélémy**. Each of these territories will also be provided with a small grant to assist in the initiation of **biophysical and socio-economic assessments**, as for the P-PRPA. This will result in the **first complete integrated coral reef and human dimensions assessment carried out at GCRMN-Caribbean sites**.

II. Report of the Biophysical Component of the GCRMN-Caribbean Workshop

Report of Biophysical Monitoring training at the Port Royal Marine Laboratory, The UWI-Mona, Jamaica, 10-14 October 2017



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I. INTRODUCTION

During the past decades, Caribbean coral reefs have been impacted by a series of disturbances that have challenged the resilience and productivity of these ecosystems. Many of the ecological goods and services that coral reefs offer to human societies have been significantly diminished. In the Caribbean, many stakeholders benefit directly or indirectly from healthy coral reef ecosystems, raising the importance of continuing efforts to conduct coral reef monitoring that provides actionable data both locally and regionally.

The GCRMN is an operational network organized under the International Coral Reef Initiative (ICRI) that works to provide scientific information and communication on the status of coral reef ecosystems to increase conservation and management of these areas. A challenge the region faces is improving monitoring across the region as outlined in Jackson et al 2013.

One important aspect for the network's future plans is to contribute with capacity building in Caribbean countries for they will inform both local and regional improvement of coral reefs and associated livelihoods by providing access to standardized monitoring data. Network capacity building started in 2016 with the first GCRMN Caribbean workshop for biophysical and socioeconomic monitoring held in Discovery Bay Marine Laboratory, Jamaica. This report documents a workshop conducted in Port Royal Marine Laboratory, Jamaica during 10-14 October 2017 to build capacity in conducting biophysical and socioeconomic monitoring according to the GCRMN-Caribbean biophysical and socioeconomic guidelines.

II. METHODOLOGY

The biophysical training comprised three different stages: (1) introductory session, (2) adaptation of the protocol to be used and (3) application of the biophysical method.

Introductory session *(10 Oct):* The objectives of this session were to: (a) discuss aims and purpose of the GCRMN biophysical monitoring guidelines and elements and (b) to identify the skills and needs of participants. Trainers and site managers determined that participants had mastered the collection of biophysical data and that training would be most effective by emphasizing data entry and management practices. They decided that all participants would collect and enter data to establish a complete GCRMN location in Port Royal according to the most preferred methods of the GCRMN-Caribbean biophysical guidelines.

Adaptation of the biophysical guidelines *(11 Oct):* Trainers led a discussion about theoretical and practical details of the six elements of the GCRMN-Caribbean biophysical guidelines to be collected: (1) abundance and biomass of key reef fish taxa, (2) relative cover of reef-building organisms (corals, coralline algae) and their dominant competitors, (3) assessment of coral health and (4) recruitment of reef-building corals, (5) abundance of key macro-invertebrate species, and (6) water quality. Trainers led a discussion on each element and its purpose in regional standardized monitoring. Participants were also familiarized with field data sheets, metadata protocol, and data entry files used for each element.

Site managers met with trainers to determine site allocation for the establishment of the Port Royal location and to determine adaptations or modifications needed to support local

management. Sites were allocated based on existing monitoring sites that fit site selection guidelines of the GCRMN and expanded to include inner cays of Port Royal (Fig. 1). A total of 8 sites were allocated to the Port Royal GCRMN location. These sites were spread out across Port Royal shelf with varying proximity to Kingston Harbor.

Application of the biophysical guidelines *(11 – 12 Oct):* Trainers and participants collected biophysical data from eight sites at Port Royal. Training days were divided into morning sessions where data were collected in the field and afternoon sessions that focused on data entry and data management. During these sessions, biophysical data were entered and gaps in process and practice were identified and logged to improve data entry and management of GCRMN-Caribbean biophysical data.

Data processing and reporting *(to be completed by April 2018):* The analysis of the photo quadrats is currently being conducted at the Laboratory of Experimental Ecology at Simon Bolivar University, Venezuela. During the workshop, trainers agreed that a report containing describing the condition of marine resources at Port Royal will be produced by the Laboratory of Experimental Ecology delivered to Port Royal Marine Laboratory by April 2018.

III. CONSIDERATIONS AND RECOMMENDATIONS

The monitoring activities of the GCRMN-Caribbean have been steadily increasing since the 2014 workshop in Curacao that established a tiered set of monitoring guidelines for the Caribbean that ensure data are comparable regionally. Members of the GCRMN-Caribbean have established more than 20 new locations since 2014, but these datasets have yet to be submitted and analyzed through a standardized process. Furthermore, there are no guidelines or supplemental materials provided by the GCRMN-Caribbean for standardized analysis of monitoring data. This workshop emphasized these needs, and the GCRMN-Caribbean plans to work towards providing solutions to these problems in 2018.
Discussions took place regarding monitoring precedent and capacity during the workshop to determine aspects of the monitoring process that were functional and those that required attention. The greatest strengths in the Jamaican GCRMN-Caribbean partners (National Environment and Planning Agency, University of the West Indies, Port Royal Marine Laboratory, and Discovery Bay Marine Laboratory) were site establishment and data collection. Jamaican partners, and elsewhere in the Caribbean, cite data entry, management, processing, and reporting as major obstacles in operationalizing data and delivering it to actionable channels.

Supplemental materials and guidance are needed for organizations and individuals interested in joining the network to continue the establishment of new GCRMN-Caribbean monitoring locations. Existing and new monitoring efforts could be made truly productive by ensuring that data are collected, analyzed, reported, and disseminated to local governance bodies that facilitate informed resource management. Furthermore, data must support a system designed for accomplishing efficient and effective regional analysis. This includes: more thorough planning to establish budgets of time, personnel, and funding needed for covering all aspects of monitoring (e.g. work plans, data collection, data processing, reporting, dissemination and communication); access to experts to support proper site establishment in the near future.

Problems arising from global and regional databases are diverse, but must of them have to do with intra and inter variability among observers and photo analysts. The differences in criteria

associated with data collection can be easily standardized by providing training and clear guidelines. However, the bias and differences in judgment among and within observers during the analysis of photo quadrats is more difficult to overcome. Image analysis possesses a myriad of subtle details, some of them related to the expertise of the observer but some others with the quality of the photo. Errors of identification from image analysis also vary depending on substrate types and normally increase with lower taxonomic resolution. If these errors are significant among sites and countries, trends and patterns can be masked. Simple decisions such as the software selected at each site for image processing and the use of different species list or classification schemes may produce profound complications for the analysis of data. There are two ways to deal with this problem: (1) to organize special workshops aimed to standardize the analysis of the photos to produce the data and (2) centralize the analysis of photos in a few number of laboratories using the same criteria for analysis of data processing. In the future the GCRMN-Caribbean must develop a strategy plan to produce the data under the standards that are desired for the type of inferences that are needed.

Figure 1. Geographic distribution of sites sampled in Port Royal

Appendix 1. GCRMN-Caribbean Workshop in Port Royal Marine Laboratory: Opening day

Appendix 2. Trainers Dr. Andy Estep and Aldo Croquer discussing details of the GCRMN-Caribbean biophysical Protocol with participants

Appendix 3. Biophysical trainers and participants after a day of field work

Appendix 4. Group of participants and trainers (SocMon and Biophysical) of the GCRMN-Caribbean workshop in Port Royal Marine Laboratory

III. Report of the Socioeconomic Component of the GCRMN-Caribbean Workshop

GCRMN-CARIBBEAN BUIDLING CAPACITY FOR CORAL REEF AND HUMAN DIMENSIONS MONITORING IN THE WIDER CARIBBEAN

Report of Socio-economic Monitoring for Coastal Management (SocMon) training at the Port Royal Marine Laboratory, The UWI-Mona, Jamaica 10-14 October 2017

Centre for Resource Management and Environmental Studies (CERMES)
University of the West Indies, Faculty of Science and Technology
Cave Hill Campus, Barbados
2018

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1 INTEGRATED CORAL REEF MONITORING THROUGH GCRMN-CARIBBEAN

The Caribbean node of the Global Socio-economic Monitoring Initiative for Coastal Management (SocMon) at the Centre for Resource Management and Environmental Studies (CERMES), The University of the West Indies, Cave Hill Campus (UWI-Cave Hill), develops regional capacity of fisheries divisions, marine protected area (MPA) management authorities and a wide range of stakeholders through training and several projects in socio-economic monitoring. Site assessments are tailored to site needs with goals and objectives aligned to relevant management plans and/or management questions or decisions. Assessment data are often compared to socio-economic and ecological secondary data in order to better understand socio-economic impacts and explain trends in socio-economic characteristics at coastal community sites. However, SocMon has never been deliberately incorporated into biophysical monitoring until recently. SocMon had its beginnings in 2000 from the Global Coral Reef Monitoring Network (GCRMN). In 1994 GCRMN was established to support the International Coral Reef Initiative's (ICRI) call for action to increase research and monitoring of coral reefs to inform policy and decision-making. By 2000, GCRMN recognised the need for collecting socio-economic data in coral reef and other coastal areas. The Caribbean node of the Global Coral Reef Monitoring Network (GCRMN-Caribbean) continues to recognise the value and applicability of SocMon and supports the incorporation of the methodology as needed to achieve relevant resource conservation and management goals.

Since the revitalisation of the GCRMN-Caribbean in 2014, CERMES has been partnering with the network to build capacity for integrated coral reef monitoring in the Caribbean through the facilitation of SocMon training and provision of technical guidance and support for the implementation of site monitoring programmes at GCRMN-Caribbean project countries. This current National Fish and Wildlife Foundation (NFWF) funded project, *Building Capacity for Coral Reef and Human Dimensions Monitoring within the Wider Caribbean*, continues a workshop-based training program developed in 2016 by GCRMN-Caribbean (through SPAW-RAC Parc National de La Guadeloupe) to increase regional capacity for bio-physical and socio-economic monitoring in the Caribbean. The project also seeks to enhance GCRMN-Caribbean efforts towards enhanced data collection and archiving in the Wider Caribbean and expands on previous regional SocMon training. Local capacity for coral reef monitoring at six participating northern Caribbean countries – Jamaica, the French Antilles (Saint Barthélémy and Saint Martin), and the Dutch Antilles (Saint Eustatius, Saba and Sint Maarten) will be expanded during this project through site-specific training workshops in ecological and socio-economic monitoring methodologies.

Methods for participatory monitoring and evaluation such as SocMon (www.socmon.org, Bunce *et al.* 2000; Bunce and Pomeroy 2003) can be a means of promoting social, adaptive and institutional learning aimed at increasing adaptive capacity and informing decision-making within coastal systems in the Caribbean. SocMon aims to advance global and regional level understanding of human interactions with, and dependence on, coastal resources. The flexible and participatory methodology enables coastal managers to identify potential problems and shocks, mitigate negative impacts and focus management priorities accordingly to achieve management objectives. SocMon is therefore a means of promoting the use of social and economic data in coastal management decision-making. It is designed to be combined with many approaches and tools including Ecosystem Based Management (EBM), Ecosystem Approach to

Fisheries (EAF), Sustainable Livelihoods Enhancement and Diversification (SLED), Integrated Coastal Zone Management (ICZM), and Marine Spatial Planning (MSP) (Edwards et al. Forthcoming).

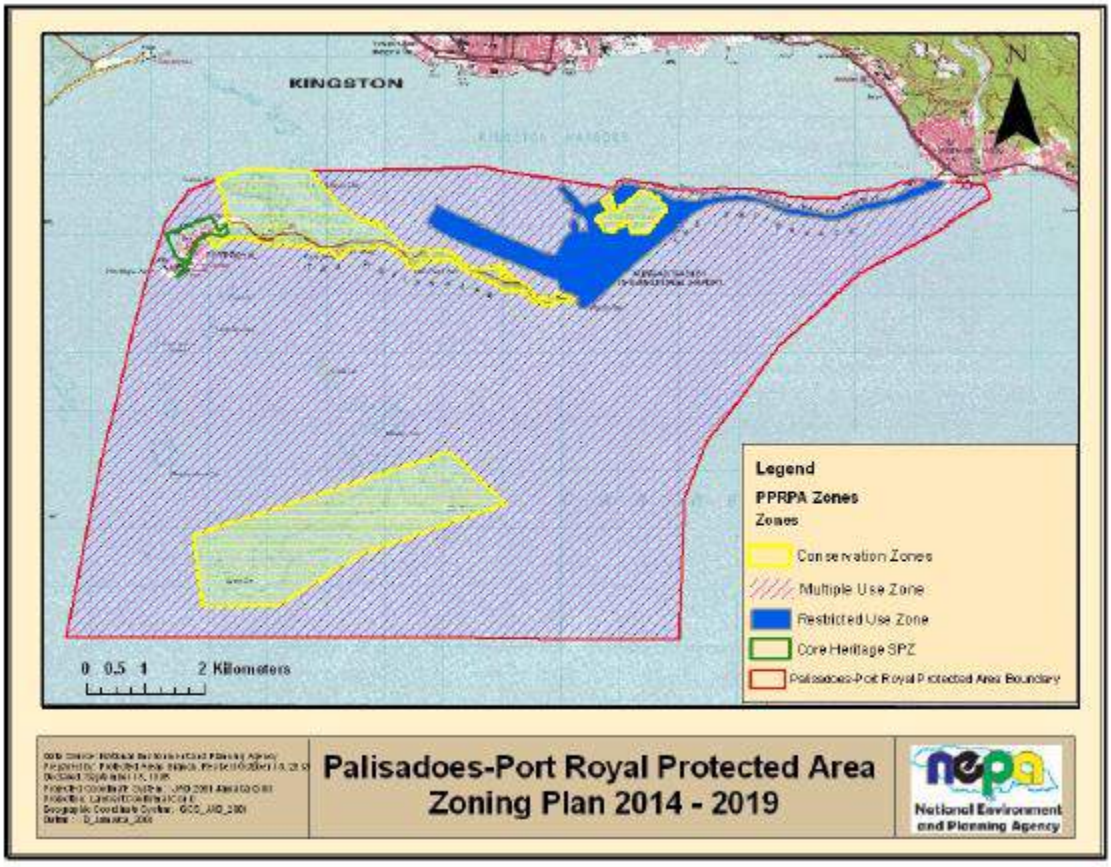

Figure 1 GCRMN-Caribbean SocMon study area
Source: NEPA (2013)

2 SOCMON TRAININGS

Capacity of the Centre for Marine Sciences and Port Royal Marine Laboratory both of the University of the West Indies, Mona, Jamaica; the National Environment and Planning Agency (NEPA), Jamaica; and Cuba National Centre for Protected Areas (CNAP) was built in SocMon via one five-day learning-by-doing SocMon training workshop from 10-14 October 2017. The workshop followed the format of typical SocMon trainings. Participants were (re-)introduced to the Global Socio-economic Monitoring Initiative, the SocMon approach to participatory, community-based socio-economic monitoring, and the newly developed SocMon Spatial tool which integrates SocMon into participatory GIS (see www.socmon.org, Bunce *et al.* 2000; Bunce and Pomeroy 2003). The format for the workshop was similar to that of the 2016 *GCRMN-Caribbean Guidelines Capacity Building Workshop: Towards comprehensive coral reef monitoring* detailed by Pena and Wood (2016) and as such will not be repeated here. See Appendix 1 for the workshop programme. The workshop emphasised practical field exercises and teamwork, seeking to simulate real monitoring programmes as much as possible. The demonstration study site, the Palisadoes-Port Royal Protected Area (P-PRPA) used throughout the training is the GCRMN-Caribbean study site for this NFWF-

funded project. One field scoping visit to the P-PRPA was included in the workshop programme and benefited by being led by NEPA staff. Maria Pena, Regional SocMon Coordinator, and Jehroum Wood, SocMon Spatial trainer, facilitated the training workshop. Bertha Simmons, freelance consultant, was re-trained in SocMon methods and assisted the Cuban participants throughout the workshop. Ms. Simmons is affiliated with the CERMES SocMon team and will assist with the implementation of SocMon in the Spanish-speaking Caribbean.

Overall eight participants – six Jamaican participants and two Cuban participants[1] received SocMon training. See Appendix 2 for the participants list. One of the six Jamaican participants, Patrice Francis (Centre for Marine Sciences) had been involved in the 2016 GCRMN-Caribbean SocMon training at the Discovery Bay Marine Laboratory in Jamaica and assisted as a workshop facilitator. Due to expressed interest from potential CERMES and GCRMN-Caribbean partners and collaborations on socio-economic monitoring at coastal sites in Cuba, SocMon training was extended to two participants from CNAP, Cuba. CNAP intends to adapt and implement the SocMon methodology in the community of Cocodrilo, Isla de la Juventud in the Archipelago of Canarreos. While the Jamaican participants were fully sponsored under the NFWF project grant with co-funding from SPAW-RAC, the Cuban participants were funded via Ocean Doctor's Cuba Conservancy Program, CERMES, SPAW-RAC and by a grant from the Latin American and Caribbean Environmental Economics (LACEEP) Program.

Critical to the workshop was the drafting of SocMon site monitoring plans for each of the respective sites (P-PRPA, Jamaica and Cocodrilo, Cuba) by the end of training. These plans form the basis of each site monitoring programme and were finalised by the sites subsequent to the completion of training. Each plan includes but is not limited to goals and objectives for site monitoring, defined study area boundaries, primary stakeholder characteristics, SocMon team roles and responsibilities, key indicators for monitoring, sampling design, proposed budget and basic communication plan for initiating monitoring. Appendices 3 and 4 comprise the draft site monitoring plans for the socio-economic monitoring at the P-PRPA, Jamaica and Cocodrilo, Cuba.

Workshop expectations were varied and numerous, some not being expectations of the training but rather future expectations. They included:

- Learn practical methodologies to engage stakeholders
- Post-workshop, integrate new knowledge and pass on to my team
- Learn how to apply the methodology and when to use it
- Develop a SocMon plan that I can implement effectively
- Become better involved in community outreach and get the fishers engaged
- Introduce SocMon methodology to the protected area (Cuba)
- Become part of the SocMon network
- Become Maria in the Spanish-speaking Caribbean

[1] While it is acknowledged that the Cuban participants and any project work implemented in Cuba by SPAW-RAC (and UWI-CERMES) are not funded by the current NFWF Grant #52776, information on future collaboration with CNAP and the implementation of SocMon at Cocodrilo is included here for completion and for GCRMN-Caribbean record-keeping purposes.

- Introduce SocMon to Centre (CNAP, Cuba)
- Validate methodology in at least three pilot sites
- To learn as much as possible

SocMon facilitators began each training day with a review of the previous day in order to capture main points of reflection of the participants as well as to determine if any areas of the SocMon phase required reinforcement. Each day's review is provided below.

Table 1 Training days in review

Day in review	Comments
1	• SocMon is participatory, opposite is extractive • Situation overview of Port Royal – issues and concerns • One stakeholder group can affect progress in a community/area (hold you back or push you ahead) • SocMon is flexible (i.e. can put in [design] own variables) • The exercise should be monitoring based [rather] than [an] assessment • SocMon is very low cost • Regional implementation (many partners) – regional and global • Need to have someone who knows GIS
2	• Follow [SocMon] guideline steps in order • During scoping use a vantage point, act like a tourist and try to blend in • Reconnaissance is the important part of SocMon Spatial • Features [SocMon Spatial] represent what you see • Attributes [SocMon Spatial) represent the information about the real feature • Defining the goal properly [monitoring goal] can be difficult
3	• "Wild and Shelly" (i.e. haphazard planning) is opposite of strategic planning • Hardest part is [development] of goals and objectives [monitoring] but critical • [Choosing SocMon] Variables – process is long • Always keep goals and objectives in mind
4	• Marry techniques with objectives and variables • Key points to remember when designing surveys • Map colour coding scheme [SocMon] interesting • Differentiate attributes and features – realise they can be one and the same • Principal method and way communicated (communication plan)

On the final day of the SocMon training, participants were asked to note activities for follow-up post-workshop and provide information on any challenges, issues or concerns they might have for implementation SocMon at the P-PRPA. Points for follow-up included the need to involve not only technical officers (from NEPA) but also public education officers in the implementation of SocMon at the P-PRPA and the need for formal communication from GCRMN-Caribbean and CERMES to NEPA to indicate the importance of the SocMon project. In the case of the implementation of SocMon at Cocodrilo, Pena, Simmons and Wood would follow-up with Álvarez Carrazana and Gallardo Toirac regarding project approval and preparations to apply SocMon in Cocodrilo.

Challenges, issues or concerns related to implementing SocMon at the P-PRPA included constraints with time to execute the SocMon assessment given that most persons (i.e. those from NEPA) workplans had already been set for 2018; and the need to increase the sub-grant for the assessment from USD 1,500 to

USD 2,500 in order to capture socio-economic information from satellite sites surrounding the P-PRPA. No challenges or issues in implementing SocMon at Cocodrilo were anticipated from the Cuban participants.

The following sub-sections contain brief notes on situation overviews of project sites and participant expectations for training. Specific participants were asked prior to the workshop to prepare situation overviews of each project site to guide planning for site monitoring. The goals and objectives for site monitoring developed by each site during the workshop and finalised subsequent to training are also presented for easy reference.

2.1 SocMon at the Palisadoes Port Royal Protected Area (P-PRPA)

Ms. Patrice Francis, Senior Scientific Officer, UWI Mona-Centre for Marine Sciences and SocMon alumnus provided a brief overview of the project site of interest. The P-PRPA is a both a natural heritage site and Ramsar site. The town of Port Royal was founded in the 1650s by the British. The devastating 1692 earthquake killed approximately 60% of the population. In general, there is a stigma attached to Port Royal due to its history as it used to be referred to as "the most wicked place in the world." The management plan for the P-PRPA is still in draft form and has not been implemented yet. There are a number of community groups within the area. One interesting stakeholder group is the Port Royal Brotherhood (owns houses within the area).

Issues and concerns within the P-PRPA include but are not limited to:

- Pollution – sewage, industrial and solid waste. No treatment systems in Port Royal as opposed to those in Harbour View (treatment facility) and the airport. Sewage and solid waste are the main issues fishermen complain off. Solid waste from gullies enters the protected area – particularly Styrofoam and plastics. There is nowhere to store garbage in the area. One participant explained during the discussion that this is attributed to culture. Jamaicans like to keep their internal environment clean. Garbage cannot be internal, it is external; hence the solid waste issue. PetroJam oil refinery is a source of some of the pollution in the area. Oil spills from ships in the harbor occur.
- Maritime operations and accidents.
- Habitat destruction, particularly related to the cutting of mangrove trees for squatting settlements, and for oysters and crabs.
- Climate impacts – sea level rise, flooding, increased temperatures.
- Use of dynamite in fishing practices.
- Green mussel as invasive species; lionfish not as much of a problem as before.

Other points of interest about the area included in the presentation included:

- The development of the road revetment to lift the coast road
- User group of interest is the Jamaican Surfers Association
- There are proposals for coastal development to make the area an entertainment zone and to develop a cruise terminal

- Most persons in the area are engaged in fishing (artisanal). Most persons will supply the fish restaurant (Gloria's Seafood) and Grand Port Royal hotel. Fishing occurs in the fishing channel (which should not happen). Fishing grounds in Port Royal are contracting due to the extension of the harbor and airport.
- Conflicts occur between fishing and shipping, and industrial versus recreational.
- There is a yacht club in the area and the P-PRPA is heavily used by persons going to the Cays. Port Royal is considered as an intransit point for people going to the Cays. The parties held there are considered to be exclusive. It is estimated that there could be up to 100 persons on Lime Cay (popular party spot) on Public Holidays. Lime Cay is leased by a tourism company. For the protected area there appears to be no organisation regarding managing the use of the area for recreation/parties. No one is allowed to light fires on Lime Cay.

Field scoping included both a land and sea tour of the Palisadoes with stops at Fort Charles, the fish landing site in Port Royal, a tour of the residential area, with specific attention paid to the concentrated industry in and around the southern border Kingston Harbour, the mangrove forest and islands (such as Refuge Cay known locally as "Refuse Cay" due to the major solid waste deposited there due to land-based pollution) and nearby cays such as Gun Cay, Rackhams Cay, Lime Cay (largest) and Drunkenmans Cay. See Figure 2.

The monitoring goal and objectives for site monitoring at the P-PRPA drafted during the workshop are provided below. These are subject to change on finalisation of the site monitoring plan.

Monitoring goal	**Monitoring objectives (up to three SMART ones)**
To promote sustainable use of the natural resources by increasing public awareness and participation in the P-PRPA.	1. To identify and assess key resources and resource use trends in the P-PRPA within the first two months.
	2. To identify stakeholders and assess levels of awareness based on past and current data in the P-PRPA within the first two months.
	3. To encourage stakeholder participation in natural resource management within the P-PRPA over 4 months.

**The goals and objectives outlined above are an adaptation of those in the P-PRPA management plan.*

Some historical perspective prior to field scoping provided by Ava Tomlinson, NEPA

Ranya Reid-Edwards, NEPA, providing some information on the P-PRPA

Time for observations and discussion at the Port Royal fish landing site

Touring the mangroves in the P-PRPA; solid waste is a major issue

A view of the fish landing site and village from the sea

Concentrated industry in Kingston Harbour

Figure 2 Field scoping photos from land and sea tours of the P-PRPA and surrounding areas

2.2 SocMon at Cocodrilo, Isla de Juventud

Ms. Álvarez Carrazana and Mr. Gallardo Toirac, Cuba National Centre for Protected Areas (CNAP), provided the situation overview of protected areas in Cuba with special focus on the community of Cocodrilo.

Cuba has 211 protected areas, 120 'properly' managed. Within these protected areas are coastal and terrestrial communities. Cocodrilo is a national park in Punto Francis. Punto Francis falls within the Protected Area of Managed Resources. Management plan implemented in 2014; operational plan is updated annually. Cuba has eight protected area categories similar to that of the six IUCN categories. The community of Cocodrilo, is within the southern area of Isla de la Juventud. With a population of only 283 people, it is a poor one. CNAP is working jointly with the Marine Research Centre to coordinating a study to economically evaluate Cocodrilo and the surrounding cays. After the recent development of the US-Cuba relationship, cruise ships have been arriving in the area of interest. Challenges include illegal fishing and turtle poaching. There are no alternative sustainable livelihoods for the people of Cocodrilo to pursue. The project focuses on sustainable alternative livelihoods in Cocodrilo and a valuation of ecosystem goods and services in the cays. The Ministry is still to approve the project. Cocodrilo is the second community CNAP has worked with on a project. The Cocodrilo project is a pilot that is hoped will be applied to other protected areas in Cuba.

3 LINKING SOCIO-ECONOMIC MONITORING WITH ECOLOGICAL MONITORING

One of the main aims of GCRMN-Caribbean's capacity building workshop-based training program is integrated coral reef monitoring for enhanced data collection in the region. People's knowledge and attitudes towards an ecosystem, and their interactions with, and dependence on, coastal resources are pivotal to socio-economic monitoring for coastal management. Ecological monitoring on the other hand generally focuses on a specific species or ecosystem, using supporting information on environmental conditions and associated organisms. Together, these two types of monitoring provide us with a picture of the human and environmental changes and trends over time in a particular location, ways in which they are interlinked and how we might improve and/or adapt management in order to address socio-economic and ecological changes and threats.

During the SocMon training component of the GCRMN-Caribbean workshop, Pena and Wood consulted with Aldo Croquer and Andrew Estep, lead ecological monitoring coordinators for the training, to ensure appropriate linkage with socio-economic monitoring parameters would be achieved. Information on proposed reef monitoring sites within and adjacent to the relevant study site (P-PRPA) were discussed to ensure the SocMon study area encompassed these survey sites. Core SocMon indicators that could be matched to key reef monitoring indicators will be identified. Linking these two types of indicators is important to better understand the socio-economic impacts of people and communities on marine resources and ecosystems, explain trends in socio-economic characteristics at each project site and determine the effects of changing resource conditions and management interventions on livelihoods and well-being. These core SocMon indicators would be included in the site monitoring plans where possible, but such inclusion is dependent on the overall goals and objectives developed for monitoring.

Throughout the SocMon training, emphasis was placed on integrating the socio-economic monitoring to be implemented with that of the ecological monitoring. Persons were reminded that all data collection efforts needed to reflect this criterion.

Of benefit to integrating these two types of monitoring was that workshop participants and monitoring teams comprised persons with backgrounds in the natural and social disciplines. For SocMon, this ensured that the ecological perspective would be incorporated into monitoring, where possible.

4 TRAINING EVALUATIONS

At the end of the workshop, all eight participants completed a workshop evaluation form in order to provide feedback to the facilitators on the training experience (Appendix 5). See Figures 1-11 for the results.

Generally, the workshop was successful with between 100% of participants combined strongly agreeing and agreeing that:

- The workshop goal had been achieved (Figure 1).
- The three objectives associated with the goal - (1) introduce SocMon Caribbean methods, (2) encourage the use of SocMon for coastal management monitoring, and (3) provide practical experience in planning and implementing site monitoring – had been achieved (Figures 2-4).
- Personal expectations for attending the workshop were achieved (Figure 5).
- SocMon preparatory activities worksheets were useful in planning site monitoring (Figure 6).
- SocMon Spatial integrates well into the preparatory activities worksheets (Figure 7).
- The workshop was well organised (Figure 8).
- The workshop was well facilitated (Figure 9).
- They would recommend a similar workshop to their colleagues (Figure 10).
- Their abilities as coastal/resource management professionals and stakeholders had been improved as a result of the workshop (Figure 11).
- They enjoyed participating in the workshop (Figure 12).

No recommended changes to the SocMon preparatory activities worksheets were provided.

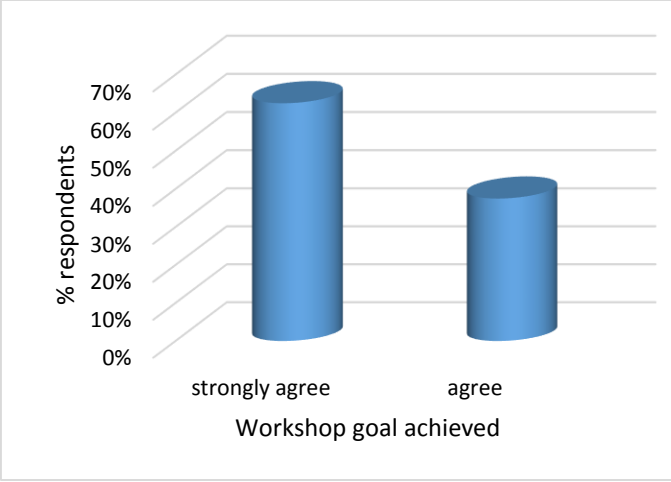

Figure 1: The goal for the workshop was fully achieved

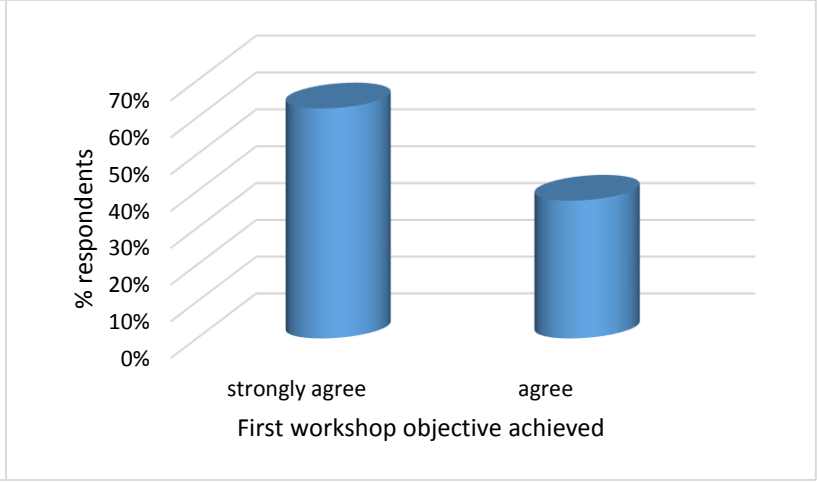

Figure 2: The first objective of the workshop (introduction to SocMon Caribbean methods) was fully achieved

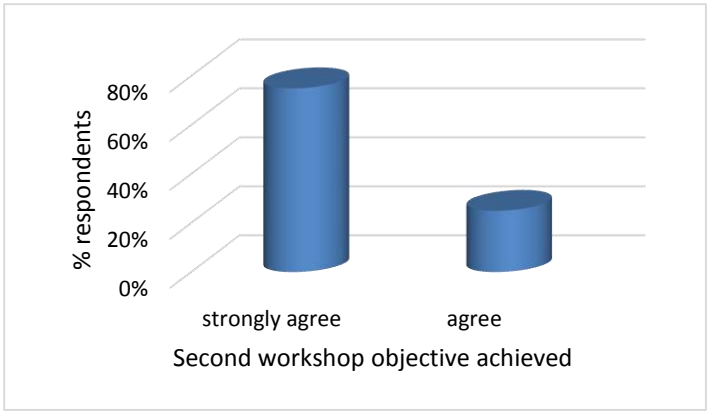

Figure 3: The second objective of the workshop (encourage use of SocMon for monitoring in coastal management) was fully achieved

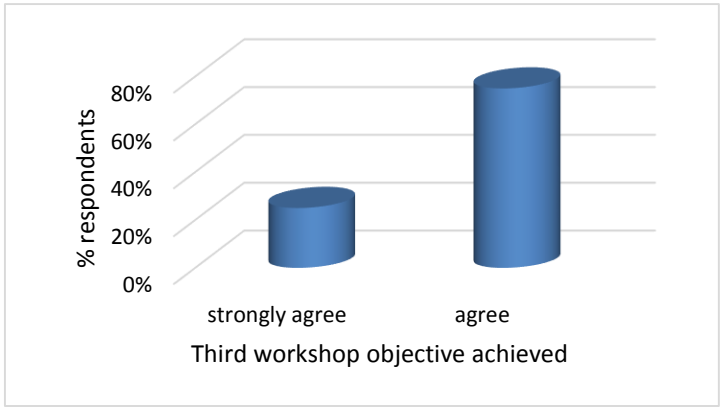

Figure 4: The third objective of the workshop (practical experience in planning and implementing site monitoring) was fully achieved

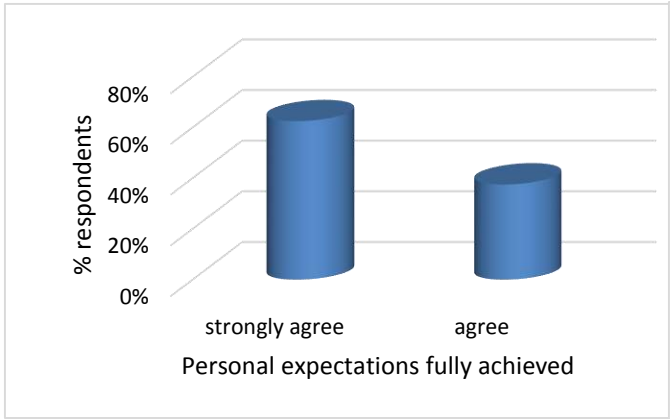

Figure 5: My own personal expectations for why I attended this workshop were fully achieved

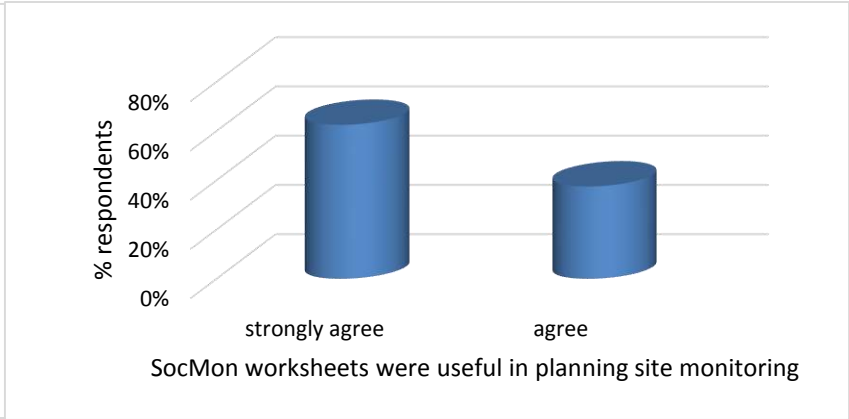

Figure 6: The SocMon Preparatory Activities Worksheets were useful in planning site monitoring

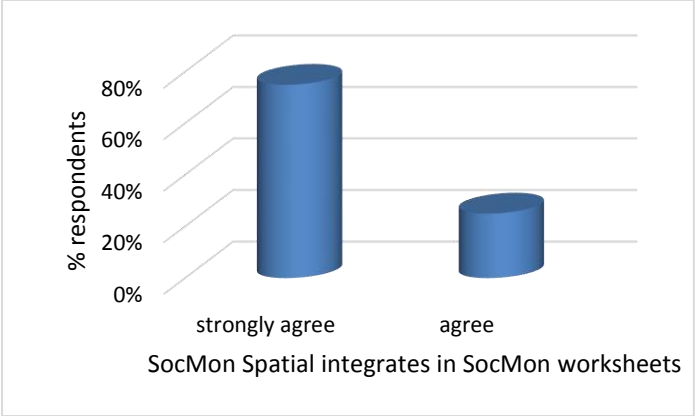

Figure 7: SocMon Spatial integrates well into the SocMon Preparatory Activities Worksheets

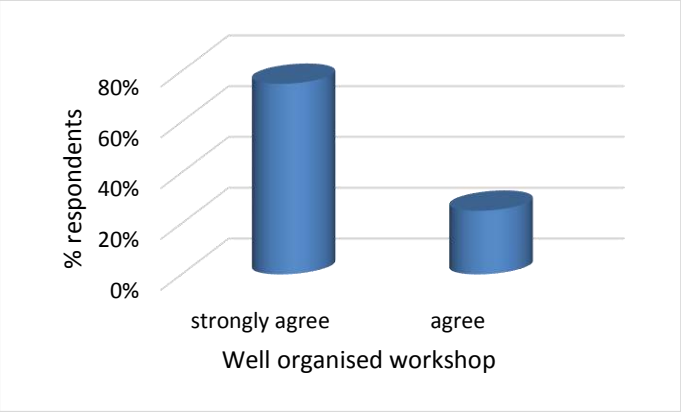

Figure 8: The workshop was well organised

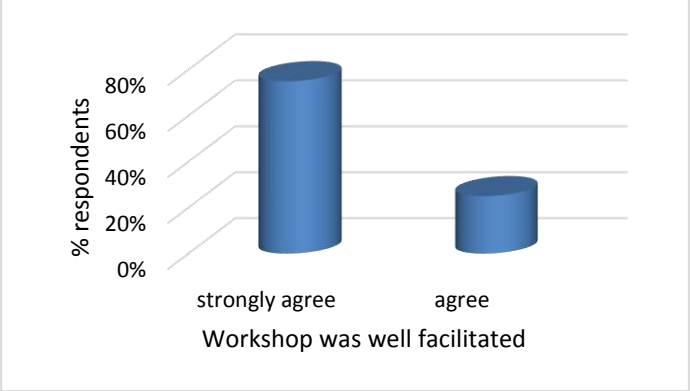

Figure 9: The workshop was well facilitated

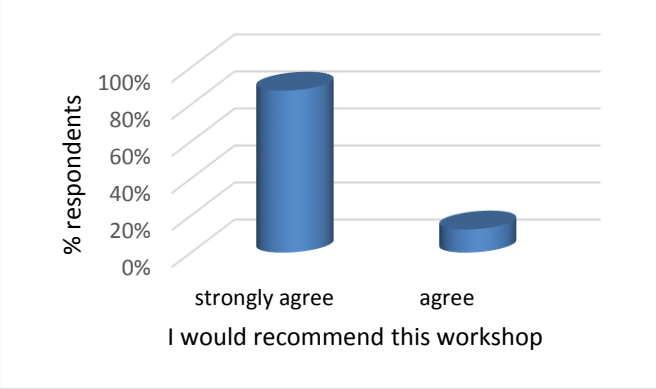

Figure 10: I would recommend my colleagues attend a workshop similar to this one

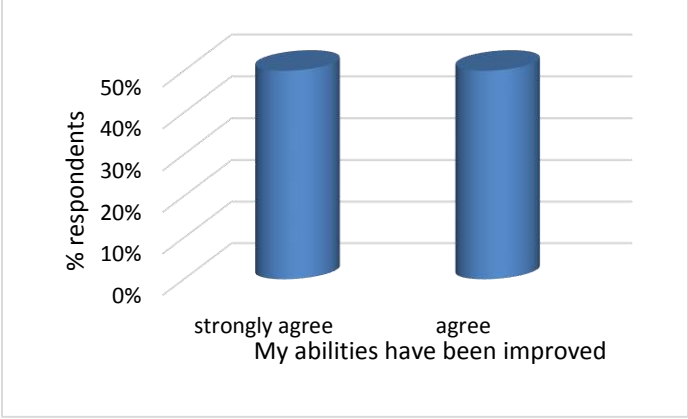

Figure 11: My abilities as a coastal/resource management professional (or stakeholder/student) have been improved as a result of this workshop

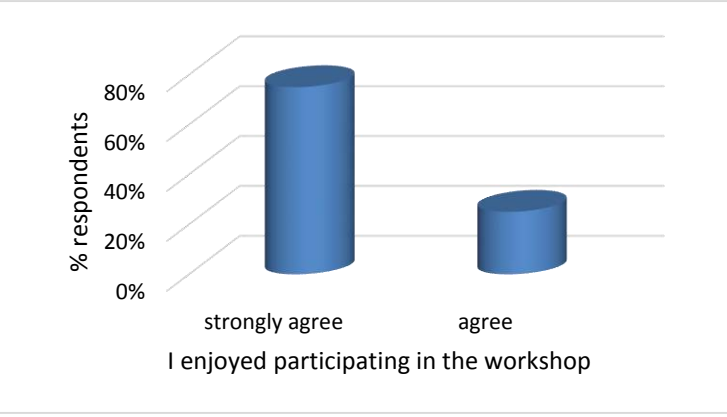

Figure 12: I enjoyed participating in this workshop

Participants liked a variety of things about the workshop:

- The resource materials e.g. manual;
- Additional facilitation techniques;
- Introduction to GIS utlising community data gathering method application;
- The group dynamic;
- The information communicated and how it was communicated;
- Having to utilise the worksheets was very useful;
- The practical illustrations and experiences/examples provided/case examples;
- The ice breakers were good;
- Field trip to /reconnaissance of the site;
- The recap of previous day's knowledge;
- Presentation handouts with space to write notes
- The flexibility of the learning process and ability to adapt the training to the country context;
- Everyone's willingness to participate actively;
- Language and terms during the training were easy to comprehend;
- Lack of internet;
- The facilitation/persons;
- Knowledge integration with SocMon Spatial.

The main things persons liked least about the training workshop was the quantity of information to be assimilated in a short period of time and the lack of practical field experience in implementing SocMon at the demonstration study site. The facilitators agree that the duration of the workshop was too short, only four days, compared to typical SocMon trainings of between 5-7 day in which it is possible to better reinforce concepts and methods, and to capitalise on practical sessions for demonstration. With the recent addition of the SocMon Spatial tool to the SocMon Caribbean approach, it is even more critical that workshops are at least 5 days in duration since the tool requires fairly in-depth instruction and practical sessions. However, usually due to funding constraints it is not possible to have extended training periods.

Recommendations for changes that could be made to the workshop were provided by seven out of the eight persons who answered the evaluation. All recommendations related to the need for more practical, hands-on experience at implementing SocMon and SocMon Spatial. With a full five-day SocMon training exercise, usually one day is devoted to data collection and analysis. It was unfortunate that this could not be the model implemented during this training.

Other thoughts, comments or suggestions were provided by three persons and were very positive. These included:

- Very good workshop and looking forward to utilising tools
- Many thanks for the great experience
- I am inspired (and follow-up reporting on the use of the technique should be required)

5 NEXT STEPS

Next steps include preparations for monitoring. The P-PRPA SocMon site team is required to finalise the SocMon site monitoring plan for the study, conduct a secondary data analysis for identification of gaps in knowledge, develop data collection instruments, submit them to CERMES for review, ensure pre-testing

of each instrument is undertaken, and provide training to interviewers (if needed) prior to collecting data. Presently, teams seem to have adequate capacity or can acquire adequate capacity to initiate data collection.

To ensure the link between socio-economic and ecological monitoring is maintained, where possible, CERMES will consult with the lead ecological monitoring coordinators during the design and review phase of all data collection instruments.

The implementation of SocMon in Cuba should begin in the mid to latter part of 2018 once the project receives government approval. CERMES will provide technical guidance and support during the implementation phase.

6 REFERENCES

Bunce, L. and R. Pomeroy. 2003. Socio-economic monitoring guidelines for coastal managers in the Caribbean: SocMon Caribbean. World Commission on Protected Areas and Australian Institute of Marine Science. 88pp.

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Pena, M. and J. Wood. 2016. Report of the Socio-economic Monitoring for Coastal Management (SocMon) Training Component, GCRMN-Caribbean Guidelines Capacity Building Workshop: Towards Comprehensive Coral Reef Monitoring, Discovery Bay Marine Lab, UWI, Jamaica, 18-22 April 2016 (DRAFT). A workshop under the framework of UNEP-Caribbean Environment Programme and in collaboration with the SPAW Regional Activity Centre. 55pp.

7 APPENDICES

APPENDIX 1: SOCMON WORKSHOP TRAINING PROGRAMME

Building Capacity for Coral Reef and Human Dimensions Monitoring
Port Royal Marine Laboratory, The UWI-Mona, Jamaica
10-14 October 2017

A workshop under the framework of UN-Environment Caribbean Environment Programme and in collaboration with the SPAW Regional Activity Centre

SOCIO-ECONOMIC MONITORING FOR COASTAL MANAGEMENT (SOCMON) PROGRAMME

Day and time	Activity
Tuesday [10 Oct]	
8:30 – 3:30	**General workshop introductory session with all workshop participants**
3:45 – 4:45	Welcome and introduction to SocMon training component SocMon participant introductions Workshop goals and objectives Workshop schedule Workshop expectations Questions and answers about the Global SocMon Initiative
4:45 – 5:30	*Speed session:* Socio-economic conditions at participating country sites (5 min presentations from participants)
Wednesday [11 Oct]	
8:30 – 9:00	Introduction to SocMon Caribbean
9:00 – 10:00	Overview: The Six Steps to SocMon
10:00 – 10:15	***BREAK***
10:15 – 12:00	Introduction to SocMon Spatial
12:00 – 12:30	*Situation overview:* Palisadoes-Port Royal Protected Area
12:30 – 1:30	***LUNCH***
1:30 – 3:30	**Group work: Site monitoring plan development** *SocMon preparatory activities for socio-economic assessment and monitoring* - Goals and objectives for monitoring; - Boundaries for monitoring; - Identification of stakeholders; - Location of stakeholders and key informants; - SocMon Spatial reconnaissance check list; - SocMon team *(SocMon Preparatory Activities Worksheet, pages 1-4)*
3:30 – 5:30	Field trip to Palisadoes-Port Royal Protected Area for field scoping and de-brief on site
	Homework: • *Prepare 5-10 slides of interesting field scoping photos (per team)* • *Identify major spatial issues, conflicts for resolution and messages for communication within and about Palisadoes-Port Royal Protected Area*

1

Day and time	Activity
Thursday [12 Oct]	
8:30 – 9:00	Review of Day 1 Palisadoes-Port Royal Protected Area field scoping discussion and slideshows by teams
9:00 – 10:00	Introduction to field data collection methods: - Secondary sources of data - Semi-structured interviews (key informants) - Structured surveys (household) - Group interviews - Focus groups - Visualisation techniques - Web-based mapping exercises and tools for SocMon Spatial
10:00 – 10:15	***BREAK***
10:15 – 12:30	**Group work: Site monitoring plan development continued** *SocMon preparatory activities and planning for socio-economic assessment and monitoring* - Refine goals and objectives for monitoring based on scoping visit; - Refine boundaries for monitoring based on field scoping; - Select SocMon variables for monitoring;
12:30 – 1:30	***LUNCH***
1:30 – 3:30	**Group work: Site monitoring plan development continued** *SocMon preparatory activities and planning for socio-economic assessment and monitoring continued.* - Link SocMon variables as features and attributes; - Organise SocMon Spatial variable packages; and - Review and compile available sources of secondary data, including secondary spatial data; - Determine gaps in information *(SocMon Preparatory Activities Worksheet, pages 3, 5-15)*
3:30 – 3:45	***BREAK***
3:45 – 5:30	*Planning for field data collection* Determine data collection methods to be used, type of sampling and sample sizes - Formulate semi-structured interview guides for key informants - Select and develop visualisation techniques for data collection - [Develop key informant interview guide] - Create maps for collecting spatial data - Select type of web tools for SocMon Spatial outputs *(SocMon Preparatory Activities Worksheet, pages 16-19)*
Friday [13 Oct]	
8:30 – 9:00	Review of Day 2
9:00 – 12:30	**Data analysis** - How to analyse data - Developing key informant narratives

Day and time	Activity
	- Developing survey coding sheets and data tables - Examples of displaying assessment results
12:30 – 1:30	***LUNCH***
1:30 – 3:30	**Post data analysis: Validation and communicating results** - Social Media Revolution 2015 video S - SocMon Spatial outputs and communication
3:30 – 3:45	***BREAK***
3:45 – 5:30	**Group work: Site monitoring plan development continued** Communication plan essentials – Who, how and what?; - Develop workplan for site assessment; - Determine critical resources required for the assessment; - Develop the budget for implementation of the assessment. *(SocMon Preparatory Activities Worksheet, pages17-20)*
Saturday [14 Oct]	
8:30 – 9:00	Review of Day 3
9:00 – 10:00	SocMon Spatial outputs and communication contd.
10:00 – 10:15	***BREAK***
10:15 – 11:00	Linking data to decision-making
11:00 – 11:30	Key lessons learned by participants about SocMon and SocMon Spatial
11:30 – 12:30	Final discussions: Next steps for implementing SocMon in Jamaica and Cuba - Capacity for socio-economic monitoring (including GIS capacity) - Activities for follow-up post workshop (next steps) - Challenges, issues or concerns - Workshop evaluation Wrap-up
12:30 – 1:30	***LUNCH***
1:30 – 5:30	**General GCRMN-Caribbean session with all workshop participants**

APPENDIX 2: PARTICIPANT LIST

Name	Country	Institution
Patrice Francis	Jamaica	Centre for Marine Sciences – UWI, Mona
Kellie Gough	Jamaica	National Environment and Planning Agency (NEPA)
Chauntelle Green	Jamaica	Port Royal Marine Laboratory (PRML)
Maureen Milbourn	Jamaica	National Environment and Planning Agency (NEPA)
Ranya Reid-Edwards	Jamaica	National Environment and Planning Agency (NEPA)
Ava Tomlinson	Jamaica	National Environment and Planning Agency (NEPA)
Yunaika Álvarez Carrazana	Cuba	Cuba National Centre for Protected Areas (CNAP)
Carlos Gallardo Toirac	Cuba	Cuba National Centre for Protected Areas (CNAP)

APPENDIX 3: PALISADOES-PORT ROYAL PROTECTED AREA DRAFT SOCMON SITE MONITORING PLAN

Socio-economic Monitoring for Coastal Management (SocMon)

Building Capacity for Coral Reef and Human Dimensions Monitoring
Port Royal Marine Laboratory, The UWI-Mona, Jamaica, 10-14 October 2017

A workshop under the framework of UNEnvironment- Caribbean Environment Programme and in collaboration withthe SPAW Regional Activity Centre

SocMon preparatory activities worksheets used to plan monitoring

These worksheets are *guides* to organising the preparatory activities for a socio-economic assessment or monitoring programme. They can be modified in any way you find useful. Other worksheets are in the GCRMN manual. Spreadsheets are often more convenient than word processing applications for working with tables of all types.

1 Introduction

You may use this worksheet to help structure your formulation of an ecosystem-based socio-economic monitoring plan for the study site of interest. The worksheet forms the basis of your SocMon site monitoring plan. Feel free to provide explanations, where applicable, for your choices in each of the section notes.

Read the SocMon literature — GCRMN manual, Caribbean guidelines and climate addendum. Also read relevant literature on the study site of interest and adjacent areas from which you can gather useful information on what should be monitored, how, when and where.

The socio-economic data and information from monitoring need to be useful for management planning, decision-making and adaptive management. A monitoring plan must take into account the local reality - available funds, human resource capacity and the demands of decisions. It has to prioritise particular variables to monitor, with good reasoning behind choices. When completing the worksheet, be sure to refer to the SocMon Caribbean guidelines and GCRMN manual for guidance.

2 Goals and objectives guiding socio-economic monitoring

Monitoring must have a goal and specific objectives for being undertaken. These are often based on management plans (e.g. fisheries, MPA, tourism) or other expressions of policy.

Monitoring goal	Monitoring objectives (up to three SMART ones)
To promote sustainable use of the natural resources by increasing public awareness and participation in the P-PRPA.	1. To identify and assess key resources and resource use trends in the P-PRPA within the first two months.
	2. To identify stakeholders and assess levels of awareness based on past and current data in the P-PRPA within the first two months.
	3. To encourage stakeholder participation in natural resource management within the P-PRPA over 4 months.

Notes:

Its an adaptation of the PRPA Management plan

GCRMN Manual: Pages 19-20, 36-40

1

3 Defining the study area

Using the information on issues and stakeholders, define the geographic area appropriate for the study site (contains all or most critical activities/issues and stakeholders). Document the specific selection criteria that you used. Clearly identifying the study area is important in identifying use patterns and potential threats to resources. The study area should include where the stakeholders live and work.

Study area selection criteria	Study area description (or attach area map)
The town of Port Royal (activities and issues)	Area which is bounded to the north by the Kingston Harbour in the vicinity of the Jamaica Constabulary Force, south by the Caribbean sea, to the east by the Admiralty Buildings and to the west by the JDF Coast Guard.
Institutional and commercial entities within	
proposed restricted area use zone	
Satellite areas: Outside fishing beaches	

Notes:

GCRMN Manual: Pages 26-28

4 Stakeholder identification

Stakeholder identification and selecting the boundaries for the study site are iterative processes. Start by identifying the activities in the area and then determine who the likely stakeholders are. Name their organisation, if any.

Study area activity or issue	Primary stakeholder [and organisation]	Secondary stakeholder [and organisation]
Fishing	Fisherfolk from satellite areas, residents	Gloria's, Hotel,
Solid Waste	Residents , NSWMA	Tourist, NEPA, TDPCO
Sewage Pollution	Residents, Fisherfolk, NWC	
Water pollution(oil)	Fishing industry	Yatchclub,
Tourism and recreational activities	Residents, Port Royal Neighborhood and Benevolent Society, YKnot, Royal Jamaica Yatch Club, Jamaica Karting Association, Jamaica Surfing Association	Rockfort Mineral Spa, Incoming visitors, JHTA, TEF, TDPCO
Commercial activity	Business owners, shops, AAJ, Ministry of Agriculture(Plant and	Chamber of Commerce

Study area activity or issue	Primary stakeholder [and organisation]	Secondary stakeholder [and organisation]
	Quarentine),	
Industrial activity	KFTL, PAJ, Caribbean Cement Company	Petrojam
Research/education	Caribbean Maritime University	

Notes:

GCRMN Manual: Pages 21-25

5 Stakeholder locations and key informants

The communities where SocMon will take place will depend primarily on the stakeholders involved in coastal management. Suggest key persons who can talk about the larger population.

Stakeholders (1° and 2°)	Location of stakeholder	Key informants for stakeholders
Residents of fishing beach	Town/satellite areas	Fishermen
Fishing Co-ops		President
Coast Guard Marine Police	Town	Sea-men, Head
Educational Institutions		Key Researchers: Brotherhood, JNHT, TEF,UDC,NEPA,UWI,CMU
Residents		

N

GCRMN Manual: Pages 21-25

6 SocMon Spatial reconnaissance checklist

Good reconnaissance is critical in the initial phases of the SocMon Spatial process. In this phase, researchers gain an understanding of on-the-ground spatial interactions which guide future monitoring activities. A checklist should be created to guide reconnaissance observations. Information of importance is "What are we looking for?", "Where is it?" and "Who can tell us?"These questions are related to the monitoring objectives, and later to the specific variables selected for monitoring.

3

Feature (What are we looking for?)	Location (Where is it?, What is it close to?)	Key informants (Who can tell us about it?, Who uses this space?)
Activities		
Fishing	Habour, Port Royal Cays	Fisherfolk Including satellite areas (Mr Lim-Chino). Fisheries Division, Fishing Co-orporatives
Tourism/Recreation	Cays, Gloria, Grand Port Royal Marina and Spa,	Owners, workers, TPDCO,TEF, Yknot, Tashina Tomlinson
Illegal dumping	Intersection New Street and High Street(infront of ONH), Surfers Point, Lady Lightbourne Corner	Residents, NSWMA
Water Pollution(Effluent)	Port Royal's landing area Broad Street	Residents, fisherfolk,
Resources		
Natural resources (marine & terrestrial) eg. Mangrove	Gypsum Wharf to Gallows Point(replanted site),	fisherfolk
Coral	Port Royal Cays	UWI, NEPA, Fisherfolk
Cays	Port Royal Cays	UWI, NEPA, Fisherfolk
Sand dune	Opposite Gunboat Beach to Fort Rocky	JNHT, NEPA, Squatters,
Fish		Fisherfolk, residents
Cultural resources:		
• Heritage	Fort Charles, Fort Rocky,	JNHT, PAJ
• archaeology	Sunken City,	JNHT
• Light house	Plumb Point	JNHT, PAJ
Schools/Educational Institution	UWI,CMI, Port Royal Primary and Infant School	Outreach Officers, Environment officers, Principals
Key infrastructure		
Utilities(cable, light, water, sewage & internet)	Town of Port Royal, Norman Manley Highway, NMIA	
transportation	Adjacent to Morgan's Harbor, Roadway into Port Royal Town	JUTC, CMU, Yknot
Fire station	Cannon Street & Tower Street	JFB, JDF CG
Police station		JCF
shops	Town Centre	
Customs		
Post office		

JDF		

7 SocMon leader and team

Although an initial study or monitoring program can be done by a single person (e.g. MSc student), the process is intended to be undertaken by an interdisciplinary team, the size and the required talents of which partly depend on the goal and objectives of the study or monitoring program. What types of expertise do you need and where from?

Skill requirement or role on team	Names and affiliations of team leader and members
GIS	GIS unit,NEPA-TBD
Public Education	Outreach officer, NEPA-TBD
Environmental Economist	NEPA –TBD
Fisheries Liasion	Fisheries Division TBD
Community gate keeper	Port Royal Neighborhood(TBD)
PAB-coordinator/team leader	NEPA-Maureen Melbourne
Survey Analyst	NEPA- Projects(TBD)
Ecologist	UWI/NEPA(TBD)

Notes:

GCRMN Manual: Pages 43-47

8 Secondary data sources

One of the first steps in SocMon is to consult secondary data sources that can be used for guiding the investigation and interpreting the results. Use this table to identify the sources of secondary data based on the objectives set for your SocMon. When completing the table also think about secondary spatial data. In future monitoring you can check if additional sources of information on the objectives become available. One row is added for general types of information. Where possible make notes about the suitability, quality, method(s) of collecting the data, when it was collected, who collected, analysed and interpreted it. When reporting, documents should also be listed in your 'References'.

Tips for scoping secondary spatial data:

- Look for information that is specifically related to the area of interest.

- Information should not be restricted to GIS data and/maps; descriptive information is important as well. For example, newspaper articles about user conflicts within a specific area.
- For GIS data:
    1. Look for information on data collection methodologies that can be easily replicated in your study, and
    2. Ensure quality by looking out for the 5 Ws: What, Where, When, hoW and by Whom.

SocMon objective	Sources of secondary data	Notes
1. To identify, collect and assess stakeholder awareness from past and current data in the P-PRPA within first month.	NEPA Reports, Fisheries Division assessment, SDC, Fishing Co-op, UDC	Reports on public awareness activity
2. Increase the stakeholder awareness about the resources and participation of the P-PRPA within 6 months.	??	
3. To identify and assess key resources and resource use trends within the P-PRPA.	Fisheries Division, PIOJ, JET, NEPA, UWI, KFTL, UDC	Reports on the fish stock, landing catch
General types of information		

Notes:

GCRMN Manual: Pages 53-57

9 Key indicators to be monitored

Based on the goal and objectives of the monitoring, you need to determine which (if not all) of the SocMon Caribbean variables[1] need to be measured, sources of secondary information to consult before interviewing (key informant, household, visualisation techniques), and practical considerations for each variable. The practical considerations include levels of difficulty in acquiring information, issues, error or uncertainty, challenges in implementing fieldwork, links to data sources that are desirable, etc. Refer to the Caribbean guidelines when selecting the variables to determine the information measured by the variable and its suitability for monitoring based on its relevance to monitoring goals and objectives.Recently, broad socio-economic parameters with links to drivers of ecological change have been developed by GCRMN-Caribbean. See below.

**Since most socio-economic information can be gathered from secondary data rather than interviews (key informant) and surveys (household) rigid distinction between variables (as shown in the SocMon Caribbean guidelines) is unnecessary. Select your variables and choose the most appropriate data collection method.*

Also remember that if a variable/indicator specific to your purposes of monitoring is not available among the suite ofSocMon Caribbean and GCRMN-Caribbeanparameters, you can design new variables.

The variable selection process for SocMon Spatial must consider the spatial relationships between features. Certain spatial representation goals may require the packaging of related variables E.g. We may have to group *Use Patterns* and *Types of Impacts* if we are monitoring. In selecting variables for monitoring, identify whether they represent a feature, an attribute or both. This will help in determining which variables must be linked as features and attributes for monitoring of spatial characteristics in this assessment.

GIS abbreviations:

a. F = Feature (These are physical points and/or areas highlighted on the map)
b. A = Attributes (These are sets of information which describe the features that they are related to)

[1]For the purpose of these worksheets, variable and indicator are being used synonymously

a) SocMon Caribbean variables

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Demographics				
K1. Study area	1-3	Topo & Google Earth/Community personnel (Mr. Lim, Resource Users)	H	F
K2. Population	1-3	Census (STATIN & PIOJ)	H	A
K3. Number of households	1-3	Census	H	A
K4. Migration rate				
K5/S1. Age	1-3	Census		
K6/S2. Gender	1-3	Census		
K7/S4. Education	1-3	Census		
S5. Religion	1-3	Census		
K8. Literacy	1-3	Census		
K9/S3. Ethnicity				
K10/S5. Religion	1-3	Census, SDC community profile	M	A
K11/S6. Language				
K12/S7. Occupation	1-3	Census, SDC community profile	H	A

8

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
S8. Household size	2-3	Census, SDC community profile	H	A
S9. Household income	1-3	Census, SDC community profile	H	A
Community infrastructure and business development				
K13. Community infrastructure and business development	1-3	Census?, SDC community profile, PIOJ	H	FA
Coastal and marine activities				
K14/S10. Activities Household Activities	1-	SDC community profile	H	A
K 15/S11. Goods and services (from activities)/ Household goods and services	1	SDC community profile, TPDCO	H	A
K16/S12 Types of use (of good/service)/Types of household uses	1-2	SDC community profile, Fisheries Division(MOE)	H	A
K17. Value of goods and services	1-3	Fisheries Division, TPDCO, Chamber of Commerce, Consumer Affairs Commission (CAC)	H	A
K18/S13. Goods and services market orientation/Household market orientation				
K19. Use patterns	1-3	Fisheries Division, TDPCO, SDC Community Profile	H	A, F
K20. Levels and types of impact	1-3	UWI, Library, Fisheries Division	H	A

9

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
K21. Level of use by outsiders	1	Fisheries Division, JDF Coast Guard	H	A
K22/S14 Household use(s)	1-2	Fisheries Division(FD)	H	A
K23. Stakeholders	1-3	UWI, KFTL, FD	H	AF
K24. Tourist profile	1-3	Ministry of Tourism (MOT)	M	A
Governance				
K25. Management body	1-3	NEPA,MOT,FD,PAJ, AAJ,UDC, SAJ	H	A
K26. Management plan	1-3	NEPA,MOT,FD,PAJ, AAJ,UDC, SAJ	H	A
K27. Enabling legislation	1-3	NEPA,MOT,FD,PAJ, AAJ,UDC, SAJ	H	A
K28. Management resources	1,3	NEPA,MOT,FD,PAJ, AAJ,UDC, SAJ	H	A
K29. Formal tenure and rules	1-3	FD	H	A
K30. Informal tenure, rules, customs and traditions	1, 3	SDC community profile	M	A
K31. Stakeholder participation	1-3	SDC Community Profile, NEPA	M	A
K32. Community and stakeholder organisations	1-3	PIOJ, UDC, Port Royal Brotherhood, Port Royal Action Team, Fishermans Cooperative	H	A
Attitudes and perceptions				

10

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
S15. Non-market and non-use values				
S16. Perceptions of resource conditions	1-3	Fisheries Division	M	A
S17. Perceived threats				
S18. Awareness of rules and regulations				
S19. Compliance				
S20. Enforcement				
S21. Participation in decision-making				
S22. Membership in stakeholder organizations				
S23. Perceived coastal management problems				
S24. Perceived coastal management solutions				
S25. Perceived community problems				
S26. Successes in coastal management				
S27. Challenges in coastal management				

11

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Material style of life				
S28. Material style of life				

See SocMon Caribbean Guidelines: Bunce and Pomeroy (2003); Pages 18-23, 30 – 68

Notes:

b) GCRMN-Caribbean parameters

Parameter to monitor (see the GCRMN-Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Tourism arrivals				
Tourism recreation				
Tourism infrastructure				
Fishing infrastructure				
Fishing pressure				
Agriculture (large-scale)				

12

Parameter to monitor (see the GCRMN-Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Other point sources pollution				

See GCRMN-Caribbean Socio-economic Guidelines

10 Variables associated with climate change

Abbreviations are used for data collecting methods:

a. BM = Biological monitoring
b. FG = Focus group interview/survey
c. HH = Household survey
d. KI = Key informant interview/survey
e. M = Mapping
f. O = Observation
g. S = Secondary data (referenced from the SEM-Pasifika Guidelines)

Area and Indicator number	Indicator and data collecting methods	Obj. # 1, 2, 3	How information might be used	Priority (high, med, or low)	Spatial info F/A
Exposure					
CC1	Demographically vulnerable groups **KI, S, HH**				
Sensitivity					
CC2	Dependence on resources and services vulnerable to climate change impacts **S, M, BM, KI, HH**				
Existing SocMon and SEM-Pasifika	Perception of resource conditions **HH**				
Adaptive Capacity					

Area and Indicator number	Indicator and data collecting methods	Obj. # 1, 2, 3	How information might be used	Priority (high, med, or low)	Spatial info F/A
CC3	Current livelihood and income diversity of household **HH, KI, seasonal calendar**				
CC4	Perceived alternative and supplemental livelihoods **HH, KI**				
CC5	Awareness of household vulnerability to climate hazards **HH (S, KI)**				
CC6	Access to, and use of, climate related knowledge **KI, HH**				
CC7	Formal and informal networks supporting climate hazard reduction and adaptation **KI**				
CC8	Ability of community to reorganise **KI, HH**				
CC9	Leadership and governance **KI, HH**				
CC10	Equitable access to resources **HH**				

Notes:

See Climate Change addendum Guidelines, Wongbusarakum and Loper (2011)

14

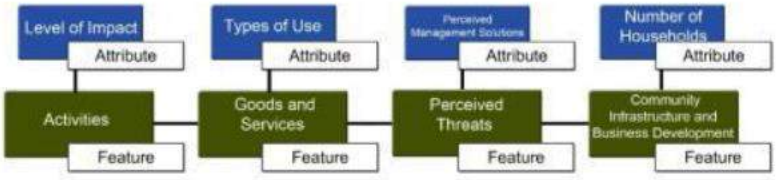
11 Organising SocMon Spatial variable packages

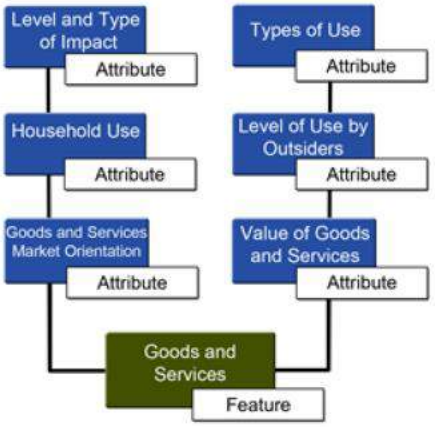
What features must be visualised?

Depending on your management objectives, feature variables can sometimes be closely linked. For example, if you are monitoring fishing pressure on coral reef re

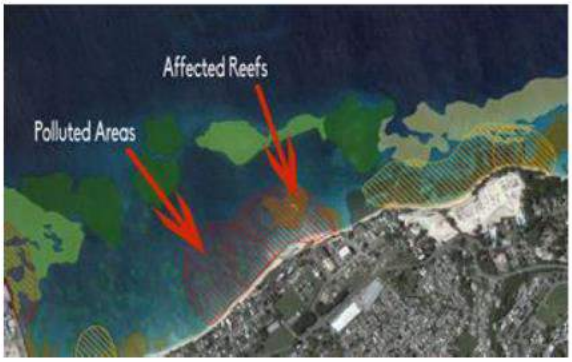
sources, you may want to show both where coral reef habitat is located and where fishing pressure is greatest. As a result you may be required to represent both *Goods and Services* and *Use Patterns* as features.

How do you want features and attributes to interact within your database? In the space provided on the following page, show which attributes are used to describe which features. Remember that attribute variables will be used to provide descriptive information about the features you are highlighting.Draw diagrams (flow charts, matrices etc.) as outlined below, which show how your feature and attribute variables are linked.





E.g Output – If we are analysing pollution effects, we must look at it in relation to the affected feature.



Draw your variable packages here

15

12 Interview sample design

Depending on many factors ranging from the objectives of monitoring to area demographics, you need to determine 'how' and 'how many' for selection of key informants and households.

a. Key informants	b. Households
Critical information areas • Types of resources • use patterns • perceptions of the threats • location of resources • Levels of stakeholder participation	**Estimated number of households in study area and means of obtaining estimate**
No. of informants: Fishing- 2 Fisheries officer and Chino-Mr Lim Tourism- 5 TDPCO, JNHT,YKNOT, Grand Port Royal Hotel, Royal Jamaica Yatch Club(RJYC) Shipping - 4, KFTL, Shipping Association Jamaica,Ports Authority Jamaica, Mr Lim	**Approx. sample size:**
Selection process: **Same as**	**Sample selection method:**

GCRMN Manual: Pages 72-73, 229-234

13 Draft interview (key informant and household) questions

There are many ways of asking the same question (content) and many types of question layout (structure). Rules apply. Select variables in your study and draft questions per variable to get information from respondents. Demonstrate that you can craft questions well using a variety of layouts, and ensure that each question is designed to provide data related to one or more of the objectives.

Questions (for key informant or household survey). Try a mix of both open and closed-ended questions		
Var. No.	**Var. name**	**Question**
K14	Activities	What types of activities happen in this area? What do people to make money in Port Royal?
K16	Type of Use	What do people fish? What do people use to fish?
K19	Use pattern	Where do people fish in Port Royal?
S17	Perceived threats	What are some of the problems you have with your activity in Port Royal? Do you have issues with any of your activities in Port Royal? What is the most important issue in the area to you? Are there any issues in this area?
K31	Stakeholder participation	What activities are stakeholders asked to participate in this area?

GCRMN Manual: Pages 96-100, 109-112

14 Visualisation techniques

The GCRMN manual describes several visualisation techniques that are useful for collecting, displaying and communicating socio-economic data informatively to document or assist decision-making. Many methods may be used simultaneously or sequentially. The means of presenting socio-economic monitoring results is critical in showing relationships among the data. Which methods will you use?

Technique and page in manual	**Variable and objective nos.**	**Notes on application of the technique to the variable and objectives (e.g. for all or some stakeholders? Issues?)**
Maps – 113	Objective 1&2 KI, K16, K19, S17	Study area, Use patterns, Threats, Types of use
Transects – 119	KI, K19	Study area,

17

Technique and page in manual	Variable and objective nos.	Notes on application of the technique to the variable and objectives (e.g. for all or some stakeholders? Issues?)
	K14	activities, Use patterns
Timelines – 121	K31, K14, K19, S17	Activities, Use patterns, Stakeholder participation, Threats
Seasonal calendars - 125		
Historical transects - 129		
Decision trees - 131		
Venn diagrams - 133		
Flow charts – 136		
Ranking - 138		

GCRMN Manual: Pages 113-145

15 Communication plan

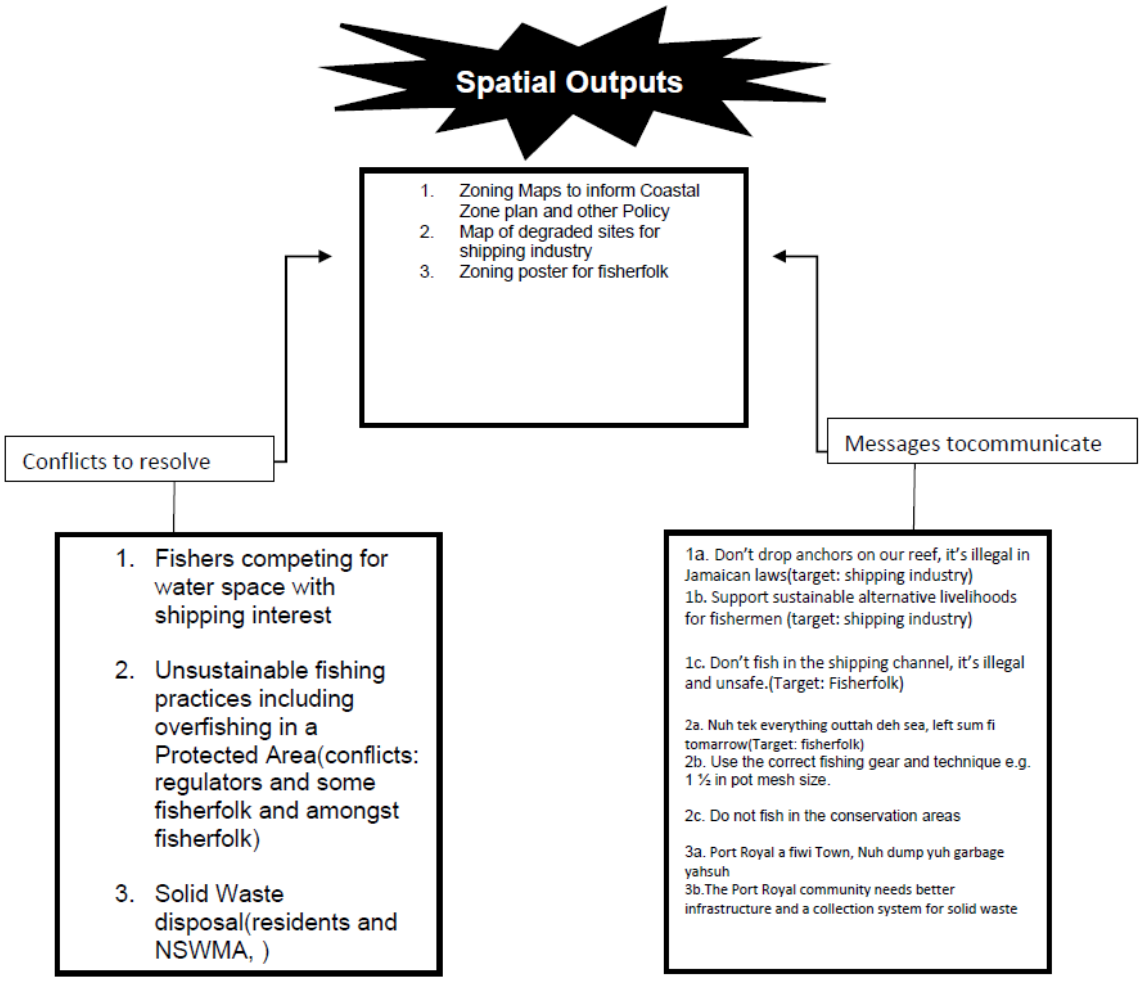
Communication of results and key learning is often done in terminal workshops, but other means are used to supplement this and ensure that various audiences receive the outputs.

Target audience	Main message	Communication product + pathway
Residents of Port Royal	Port Royal a fiwi Town, Nuh dump yuh garbage yahsuh	Jinge, poster, Pathway: radio, party
Fisherfolk	Nuh tek everything outtah deh sea, left sum fi tomarrow	Jingle, Poster, promotional items- (water bottle, raincoat) Pathway: video, radio, town cry
Shipping industry	Don't drop anchors on our reef, it's illegal in Jamaican laws	Multilingual fact sheet, posters, video, enforcement instrument:

Notes:

16 Determining spatial outputs

Using a "bottom-up" approach complete the diagram below. Start by identifying the major spatial issues and work your way up.



Major Spatial Issues

- Unsustainable fishing in a Protected Area
- Solid Waste disposal
- Resource use conflicts (fishers competing for water space with shipping interest)

17 Work plan schedule

A SocMon study should take no more than one month (at most 6 weeks), so you need to schedule your work accordingly, remembering the SocMon stages including validation. For the purposes of this training workshop, set out tasks under each heading for the implementation of the SocMon assessment at the chosen study area. Provide an estimate of the number of /weeks required for each task.

Activity / task Month →	**1**	**2**	**3**	**4**	**5**	**6**
Preparatory activities						
Proposal Preparation • Refine/adjust, goals, objectives • Determine/identify additional resources required (human resources, financial) inclusive of SocMon Team • prepare draft proposal inclusive of evaluation methods • Request approval and support of Senior management Team • Identify sources of secondary data (maps, reports documents etc.) and begin collection						
Community Walk • Identify community liaison • Arrange dates • Prepare material for sensitization • Undertake activity						
Secondary data collection						
Undertake desktop research • Gather data from sources identified • Prepare bibliography • Undertake content analysis and identify gaps						
Primary data collection and observation						
Identify instruments/techniques to be used to collect and analyse data						

Activity / task Month →	1	2	3	4	5	6
Design data collection instruments and techniques						
Meet with data collection team and undertake prep						
Pre-test instruments and make adjustments where necessary						
Administer surveys/data collection instruments/techniques (spatial etc.)						
Data analysis and interpretation						
Collate and input responses						
Undertake analyses						
Prepare draft report based on data analysis						
Determine communication approaches						
Validation, communication, adaptation						
Arrange validation exercises with stakeholders						
Amend and finalize report						
Develop communication products						
Disseminate communication products						
Determine aspects of management plan/stratgey for adaptation						
Undertake project evaluation						

Notes:

18 Critical research resources required (budget and non-budget)

Many resources will be used in the research, but there are usually just a few that are so critical the assessment may not be able to proceed without them. You must know early what these are.

Resource description	Use of resource	Comments on availability

Vehicle	Transportation to the site	NEPA fleet or personal vehicles of travelling officers
Boat and fuel	Transportation and reconnaissance activities	UWI, Mr. Lim and other community members, Yacht Club
Venue	Meeting place for project activities	Church, CMU, Primary school
Base maps/shapefiles	To support spatial/GIS work	NEPA maps, NLA, NEPA GIS personnel
Printer /plotter access	Preparation of surveys, printing of large maps, posters, fact sheets	Not readily available, outsource when necessary
paper	posters, fact sheets, maps	Purchase through project
Communication products e.g. jingles, posters, promotional items, fact sheets, maps	Message communication	NEPA to design, outsource Jingle production and airing to JIS, Outsource promotional items

19 Budget

The SocMon methodology is intended to be affordable so that monitoring can be sustained. Pay close attention to what are realistic costs, including in-kind contributions that may be available.

Amend budget to $2500 USD

Description of expense	**No. of units**	**Unit cost***	**Total cost***
Secondary data (SDC reports, census data, maps etc.)			
Transportation (car)	20 trips to Port Royal 10 trips to satellite locations	$2500 per trip $2500 per trip	$50,000.00 $25,000.00
Transportation (boat)	5 trips	$10,000	$ 50,000.00
Communication products	a. 50 fact sheet b. 1 30 sec.jingle production and airings-town crier c. 3 sets	$0.00 Production of jingle-$30,000 (three sites, three airings per site @$10,000 each)$30,000.00 $0.00	$0.00 $60,000.00

	of posters -75 fliers(letter size). d. 12 posters (4 per site) 12x36 50 hats-promotional items	$24,000.00	
Venue rental	4 meetings	$40,0000	
Refreshment/Food	200 cups soup Kool aid/Virginia Deer/Pure Bulk Syrup	$15,000 $2500	
Ink for printing survey tools	2 black cartridges 2 Colour cartridges	$20,000.00 $40,000.00	
Plotter paper	1 roll	$8000.00	
Letter size paper	10 reams	$7000.00	
Resources for facilitation (markers, labels, cartridge paper)		$5000.00	
Subsistence	7 officers, 10 days @$2000 per day	$140,000.00	
		Sum total of SocMoncosts	$486,500 $3713.74 USD using exchange rate of $131JMD to 1 USD

* = currency used [JMD]

Budget explanatory notes (use if needed to explain calculations/estimations)

APPENDIX 4: COCODRILO DRAFT SOCMON SITE MONITORING PLAN

1 Introduction

You may use this worksheet to help structure your formulation of an ecosystem-based socio-economic monitoring plan for the study site of interest. The worksheet forms the basis of your SocMon site monitoring plan. Feel free to provide explanations, where applicable, for your choices in each of the section notes.

Read the SocMon literature — GCRMN manual, Caribbean guidelines and climate addendum. Also read relevant literature on the study site of interest and adjacent areas from which you can gather useful information on what should be monitored, how, when and where.

The socio-economic data and information from monitoring need to be useful for management planning, decision-making and adaptive management. A monitoring plan must take into account the local reality - available funds, human resource capacity and the demands of decisions. It has to prioritise particular variables to monitor, with good reasoning behind choices. When completing the worksheet, be sure to refer to the SocMon Caribbean guidelines and GCRMN manual for guidance.

2 Goals and objectives guiding socio-economic monitoring

Monitoring must have a goal and specific objectives for being undertaken. These are often based on management plans (e.g. fisheries, MPA, tourism) or other expressions of policy.

Monitoring goal	**Monitoring objectives (up to three SMART ones)**
Monitorear las alternativas socioeconómicas de subsistencia para la comunidad de Cocodrilo. To monitor sustainable alternative livelihood options for the community of Cocodrilo	1. Caracterizar la comunidad de Cocodrilo desde indicadores socioeconómicos. Characterize the Cocodrilo community using socioeconomic indicators
	2. Identificar condiciones socioeconómicas que posibiliten opciones de alternativas de subsistencia To identify the socio-economics conditions that will enalble alternative livelihood options.
	3. Definir alternativas socioeconómicas sostenibles en la comunidad de Cocodrilo. Define sustainable socio-economic alternatives within the Cocodrilo community

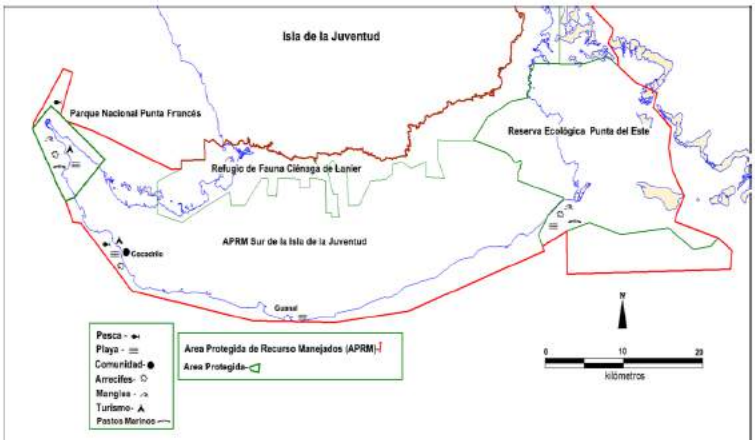
Notes:

1

GCRMN Manual: Pages 19-20, 36-40

3 Defining the study area

Using the information on issues and stakeholders, define the geographic area appropriate for the study site (contains all or most critical activities/issues and stakeholders). Document the specific selection criteria that you used. Clearly identifying the study area is important in identifying use patterns and potential threats to resources. The study area should include where the stakeholders live and work.

Study area selection criteria	Study area description (or attach area map)
Comunidad con difícil acceso y emprobrecida	
Única comunidad dentro del área protegida de recursos manejados (APRM)	
Reducida opción de empleos formales e informales	
Comunidad vulnerable antes los efectos del cambio climático	
Área Protegida con elevada presión sobre los recursos naturales.	

Notes: Poner el mapa desde Punta Francés hasta un poco más allá de la comunidad de cocodrilo

GCRMN Manual: Pages 26-28

4 Stakeholder identification

Stakeholder identification and selecting the boundaries for the study site are iterative processes. Start by identifying the activities in the area and then determine who the likely stakeholders are. Name their organisation, if any.

Study area activity or issue	Primary stakeholder [and organisation]	Secondary stakeholder [and organisation]

Study area activity or issue	Primary stakeholder [and organisation]	Secondary stakeholder [and organisation]
Sobrepesca, pesca ilegal	Pescadores y empresa pesquera,	Hotel, restaurantes, turismo, Oficina de ciencia y regulaciones pesqueras del Ministerio de la Industria Alimentaria.
Turismo	Guía de buceo (dive shop) hotel	Ministerio de Turismo adminstración del área protegida
Acceso a la comunidad	Pobladores, trabajadores de la conservación y del turismo	Gobierno Local, Empresa para la protección de Flora y la Fauna y Ministerio del Turismo
Insuficientes opciones de empleo	Pobladores de la comunidad	Gobierno Local y el Ministerio de Trabajo y Seguridad Social

Notes:

GCRMN Manual: Pages 21-25

5 Stakeholder locations and key informants

The communities where SocMon will take place will depend primarily on the stakeholders involved in coastal management. Suggest key persons who can talk about the larger population.

Stakeholders (1° and 2°)	Location of stakeholder	Key informants for stakeholders
Líder comunitario	En la comunidad	Armando
Dive shop operator	En la comunidad	Fidel
Delegado de la circunscripción y administración del área	Cocodrilo y área protegida	Pedro, Carlos y Reinaldo
Presidente de la cooperativa	En la comunidad	Marlon
Gerente del hotel	En la comunidad	Enrique
Gobierno local(turismo y pesca)	Nueva Gerona	Carlos y Augusto

Notes:

3

GCRMN Manual: Pages 21-25

6 SocMon Spatial reconnaissance checklist

Good reconnaissance is critical in the initial phases of the SocMon Spatial process. In this phase, researchers gain an understanding of on-the-ground spatial interactions which guide future monitoring activities. A checklist should be created to guide reconnaissance observations. Information of importance is "What are we looking for?", "Where is it?" and "Who can tell us?" These questions are related to the monitoring objectives, and later to the specific variables selected for monitoring.

Feature (What are we looking for?)	**Location (Where is it?, What is it close to?)**	**Key informants (Who can tell us about it?, Who uses this space?) and association**
Activities		
Fishing (fly, with harpoon)		Community leader, fishermen
Watersports (snorkeling, Scuba dive)	National Park (dive site)	Dive shop operator
Tourism	North-South area of the Island and inside of the community	Area manager, tourism agent
Charcoal productions	North of the community	Communal members
Houses for rent	Distributed in the community	Owners of rentals
Apiculture	North of the community	Bee keepers, communal leaders
Resources		
Mangroves		Area manager, research and management centres
Marabú ()		Community members
Coral Reef	Sorrounding the South, west and north of the community	Area manager, diver shop operator, research and management centres
Rentals	Distributed around the community	House owners
Key infrastructure		
Rentals	In the community	House owners
Hotel	North-West of the community	Hotel administrator
Primary and Secondary School	Inside the community	School principal
Bodega	Inside the community	Bodeguero

4

Pd: Pendient (the location of the apiculture activity)

Poner la localización e la actividad de apicultura

7 SocMon leader and team

Although an initial study or monitoring program can be done by a single person (e.g. MSc student), the process is intended to be undertaken by an interdisciplinary team, the size and the required talents of which partly depend on the goal and objectives of the study or monitoring program. What types of expertise do you need and where from?

Skill requirement or role on team	Names and affiliations of team leader and members
SocMon Coordinator/Sociologist	Yunaika
Coordinador técnico para la recolección y análisis de dato	Carlos
Data collection Data Analysis	Zulema
Data collection and Analysis	Miguel
Data collection and analysis	Maria Rosa
SIG	Jose Augusto

Notes:

GCRMN Manual: Pages 43-47

8 Secondary data sources

One of the first steps in SocMon is to consult secondary data sources that can be used for guiding the investigation and interpreting the results. Use this table to identify the sources of secondary data based on the objectives set for your SocMon. When completing the table also think about secondary spatial data. In future monitoring you can check if additional sources of information on the objectives become available. One row is added for general types of information. Where possible make notes about the suitability, quality, method(s) of collecting the data, when it was collected, who collected, analysed and interpreted it. When reporting, documents should also be listed in your 'References'.

Tips for scoping secondary spatial data:

- Look for information that is specifically related to the area of interest.

- Information should not be restricted to GIS data and/maps; descriptive information is important as well. For example, newspaper articles about user conflicts within a specific area.
- For GIS data:
    1. Look for information on data collection methodologies that can be easily replicated in your study, and
    2. Ensure quality by looking out for the 5 Ws: What, Where, When, How and by Whom.

SocMon objective	Sources of secondary data	Notes
1.		
2.		
3.		
General types of information		

Notes:

GCRMN Manual: Pages 53-57

6

9 Key indicators to be monitored

Based on the goal and objectives of the monitoring, you need to determine which (if not all) of the SocMon Caribbean variables[1] need to be measured, sources of secondary information to consult before interviewing (key informant, household, visualisation techniques), and practical considerations for each variable. The practical considerations include levels of difficulty in acquiring information, issues, error or uncertainty, challenges in implementing fieldwork, links to data sources that are desirable, etc. Refer to the Caribbean guidelines when selecting the variables to determine the information measured by the variable and its suitability for monitoring based on its relevance to monitoring goals and objectives. Recently, broad socio-economic parameters with links to drivers of ecological change have been developed by GCRMN-Caribbean. See below.

**Since most socio-economic information can be gathered from secondary data rather than interviews (key informant) and surveys (household) rigid distinction between variables (as shown in the SocMon Caribbean guidelines) is unnecessary. Select your variables and choose the most appropriate data collection method.*

Also remember that if a variable/indicator specific to your purposes of monitoring is not available among the suite of SocMon Caribbean and GCRMN-Caribbean parameters, you can design new variables.

The variable selection process for SocMon Spatial must consider the spatial relationships between features. Certain spatial representation goals may require the packaging of related variables E.g. We may have to group *Use Patterns* and *Types of Impacts* if we are monitoring. In selecting variables for monitoring, identify whether they represent a feature, an attribute or both. This will help in determining which variables must be linked as features and attributes for monitoring of spatial characteristics in this assessment.

GIS abbreviations:

a. F = Feature (These are physical points and/or areas highlighted on the map)
b. A = Attributes (These are sets of information which describe the features that they are related to)

[1] For the purpose of these worksheets, variable and indicator are being used synonymously

a) SocMon Caribbean variables

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Demographics				
K1. Study area	1	Plan de manejo, investigaciones sociales de la UH, centro de investigaciones marinas UH. Management plan of the area, social investigations of the University of Havana, marine research center of the University of Havana.	Alta (A) High (H)	Rasgo (R) Feature (F)
K2. Population	1	Plan de manejo, investigaciones sociales de la UH, centro de investigaciones marinas UH. Management plan of the area, social investigations of the University of Havana, marine research center of the University of Havana.	Alta	Atributo (A) Atribute (A)
K3. Number of households	1	Plan de manejo, investigaciones sociales de la UH, centro de investigaciones marinas UH. Management plan of the area, social investigations of the University of Havana, marine research center of the University of Havana.	Alta	A A
K4. Migration rate				
K5/S1. Age	1	Plan de manejo, investigaciones sociales de la UH, centro de investigaciones marinas UH. Management plan of the area, social investigations of the University of Havana, marine research center of the University of Havana.	Alta	A A

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
K6/S2. Gender	1	Plan de manejo, investigaciones sociales de la UH, centro de investigaciones marinas UH. Management plan of the area, social investigations of the University of Havana, marine research center of the University of Havana.	Alta	A
K7/S4. Education	1	Plan de manejo, investigaciones sociales de la UH, centro de investigaciones marinas UH. Management plan of the area, social investigations of the University of Havana, marine research center of the University of Havana.	Alta	A
S5. Religion				
K8. Literacy				
K9/S3. Ethnicity				
K10/S5. Religion				
K11/S6. Language				
K12/S7. Occupation		Encuestas Survey	Alta H	Atributo A
S8. Household size			Alta H	Atributo A
S9. Household income				
Community infrastructure and business development				

9

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
K13. Community infrastructure and business development	1	Plan de manejo del área. Management plan of the area.	Media (M) Medium (M)	Rasgo F
Coastal and marine activities				
K14/S10. Activities Household Activities	1,2	Encuestas Survey	Alta	Atributo
K 15/S11. Goods and services (from activities)/ Household goods and services	2,3	Encuestas Survey	Alta	Atribto
K16/S12 Types of use (of good/service) /Types of household uses	2, 3	Encuestas Survey	Alta	Atributo
~~K17. Value of goods and services~~				
K18/S13. Goods and services market orientation/Household market orientation	2,3	Encuestas Survey	Media	Atributo
~~K19. Use patterns~~				
~~K20. Levels and types of impact~~				
~~K21. Level of use by outsiders~~				
~~K22/S14 Household use(s)~~				
K23. Stakeholders	1,2	Plan de manejo del área. Management plan of the area.	Alta	Atributo

10

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
K24. Tourist profile	1,2,3	Informantes claves, entrevista. Key informant, survey.	Alta	Atributo
Governance				
K25. Management body	1	Plan de manejo del área. Management plan of the area.	Alta	Atributo
K26. Management plan	2,3	Plan de manejo del área y administración del área. Management plan of the area and area´s administration.	Alta	Atributo
K27. Enabling legislation	3	Plan de manejo del área. Management plan of the area.	Alta	Alta
K28. Management resources	2,3	Plan de manejo del área, administración del área y gobierno local. Management plan of the area, area´s administration and local government.	Alta	Atributo
K29. Formal tenure and rules	2,3	Plan de manejo del área. Management plan of the area.	Media	Atributo
K30. Informal tenure, rules, customs and traditions	1,2,3	Plan de manejo del área, encuestas Management plan of the area and survey.	Alta	Atributo
K31. Stakeholder participation	2,3	Encuesta, plan de manejo del área y gobierno local Survey, Management plan of the area and local government.	Alta	Atributo
K32. Community and stakeholder organisations	1,2,3	Plan de manejo del área, gobierno local y encuesta. Management plan of the area, local government and survey.	Alta	Atributo
Attitudes and perceptions				

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
~~S15. Non-market and non-use values~~				
S16. Perceptions of resource conditions	2	Entrevista semi-estructurada a informantes claves. Semi-structured interview with key informants.	Alta	Atributo
S17. Perceived threats (cambio climático)	1,2,3	Plan de manejo del área y encuestas. Management plan of the area and survey.	Alta	Atributo
~~S18. Awareness of rules and regulations~~				
~~S19. Compliance~~				
~~S20. Enforcement~~				
S21. Participation in decision-making	1,2,3	Plan de manejo del área y encuestas. Management plan of the area and survey.	Alta	Atributo
~~S22. Membership in stakeholder organizations~~				
S23. Perceived coastal management problems	1,2,3	Plan de manejo del área y encuestas. Management plan of the area and survey.	Media	Atributo y Rasgo
~~S24. Perceived coastal management solutions~~				
S25. Perceived community problems	1,2,	Encuesta y entrevista semiestructurada. Survey an semi-structured interview whit key informants.	Alta	Atributo
S26. Successes in coastal management				

Variable to monitor (see the Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
S27. Challenges in coastal management				
Material style of life				
S28. Material style of life				

See SocMon Caribbean Guidelines: Bunce and Pomeroy (2003); Pages 18-23, 30 – 68

Notes:

b) GCRMN-Caribbean parameters

Parameter to monitor (see the GCRMN-Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Tourism arrivals				
Tourism recreation				
Tourism infrastructure	2	Plan de manejo del área, observación. Management plan of the area and observation.	Media	Rasgo
Fishing infrastructure	2	Plan de manejo del área, observación. Management plan of the area and observation.	Media	Rasgo
Fishing pressure				
Agriculture (large-scale)				

13

Parameter to monitor (see the GCRMN-Caribbean Guidelines)	Obj. # 1, 2, 3	Secondary and key sources of information and comments on factors to be taken into account	Priority (high, med, or low)	Spatial info F/A
Other point sources pollution				

See GCRMN-Caribbean Socio-economic Guidelines

10 Variables associated with climate change

Abbreviations are used for data collecting methods:

a. BM = Biological monitoring
b. FG = Focus group interview/survey
c. HH = Household survey
d. KI = Key informant interview/survey
e. M = Mapping
f. O = Observation
g. S = Secondary data (referenced from the SEM-Pasifika Guidelines)

Area and Indicator number	Indicator and data collecting methods	Obj. # 1, 2, 3	How information might be used	Priority (high, med, or low)	Spatial info F/A
Exposure					
CC1	Demographically vulnerable groups **KI, S, HH**				
Sensitivity					
CC2	Dependence on resources and services vulnerable to climate change impacts **S, M, BM, KI, HH**	2,3	Plan de manejo, encuestas y entrevista semi-estructurada. Management plan of the area and survey and semi-structured interview.	H	A
Existing SocMon and SEM-Pasifika	Perception of resource conditions **HH**				
Adaptive Capacity					

14

Area and Indicator number	Indicator and data collecting methods	Obj. # 1, 2, 3	How information might be used	Priority (high, med, or low)	Spatial info F/A
CC3	Current livelihood and income diversity of household **HH, KI, seasonal calendar**	2			
CC4	Perceived alternative and supplemental livelihoods **HH, KI**	1,2,3	Encuenta Survey	H	A
CC5	Awareness of household vulnerability to climate hazards **HH (S, KI)**				
CC6	Access to, and use of, climate related knowledge **KI, HH**				
CC7	Formal and informal networks supporting climate hazard reduction and adaptation **KI**				
CC8	Ability of community to reorganise **KI, HH**	3	Encuesta Survey	M	A
CC9	Leadership and governance **KI, HH**				
CC10	Equitable access to resources **HH**				

Notes:

See Climate Change addendum Guidelines, Wongbusarakum and Loper (2011)

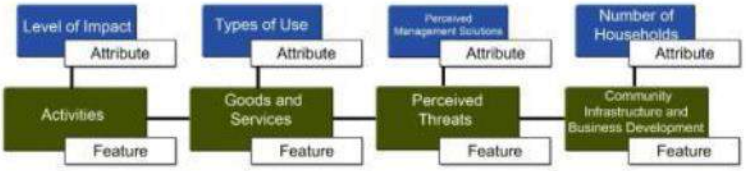
15

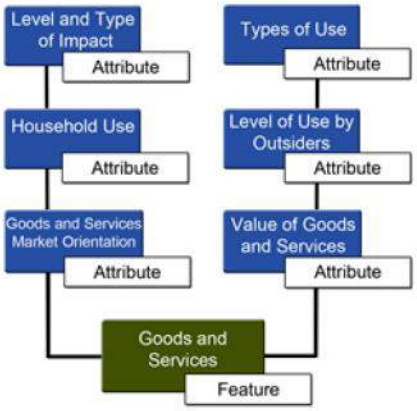
11 Organising SocMon Spatial variable packages

What features must be visualised?

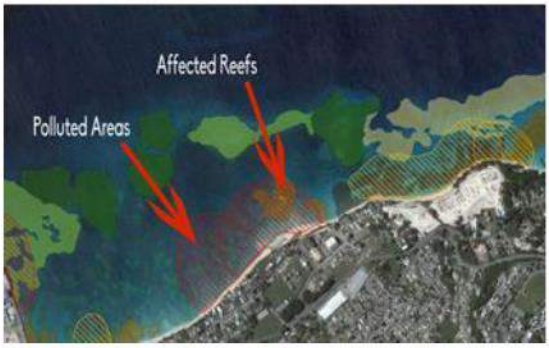
Depending on your management objectives, feature variables can sometimes be closely linked. For example, if you are monitoring fishing pressure on coral reef resources, you may want to show both where coral reef habitat is located and where fishing pressure is greatest. As a result you may be required to represent both *Goods and Services* and *Use Patterns* as features.

How do you want features and attributes to interact within your database? In the space provided on the following page, show which attributes are used to describe which features. Remember that attribute variables will be used to provide descriptive information about the features you are highlighting. Draw diagrams (flow charts, matrices etc.) as outlined below, which show how your feature and attribute variables are linked.





E.g Output – If we are analysing pollution effects, we must look at it in relation to the affected feature.



Draw your variable packages here

16

12 Interview sample design

Depending on many factors ranging from the objectives of monitoring to area demographics, you need to determine 'how' and 'how many' for selection of key informants and households.

a. Key informants	b. Households
Critical information areas	**Estimated number of households in study area and means of obtaining estimate**
No. of informants:	**Approx. sample size:**
Selection process:	**Sample selection method:**

GCRMN Manual: Pages 72-73, 229-234

13 Draft interview (key informant and household) questions

There are many ways of asking the same question (content) and many types of question layout (structure). Rules apply. Select variables in your study and draft questions per variable to get information from respondents. Demonstrate that you can craft questions well using a variety of layouts, and ensure that each question is designed to provide data related to one or more of the objectives.

Questions (for key informant or household survey). Try a mix of both open and closed-ended questions		
Var. No.	**Var. name**	**Question**

17

Questions (for key informant or household survey). Try a mix of both open and closed-ended questions		
Var. No.	**Var. name**	**Question**

GCRMN Manual: Pages 96-100, 109-112

Nota: La realización de las preguntas estructuradas y semiestructuradas dirigidas a informantes claves se elaborará de conjunto con el equipo de SocMon una vez realizada la primera visita a la comunidad.

14 Visualisation techniques

The GCRMN manual describes several visualisation techniques that are useful for collecting, displaying and communicating socio-economic data informatively to document or assist decision-making. Many methods may be used simultaneously or sequentially. The means of presenting socio-economic monitoring results is critical in showing relationships among the data. Which methods will you use?

Technique and page in manual	Variable and objective nos.	Notes on application of the technique to the variable and objectives (e.g. for all or some stakeholders? Issues?)
Maps – 113		
Transects - 119		
Timelines - 121		
Seasonal calendars - 125		
Historical transects - 129		
Decision trees - 131		
Venn diagrams - 133		
Flow charts – 136		
Ranking - 138		

GCRMN Manual: Pages 113-145

15 Communication plan

Communication of results and key learning is often done in terminal workshops, but other means are used to supplement this and ensure that various audiences receive the outputs.

Target audience	Main message	Communication product + pathway

Notes:

19

16 Determining spatial outputs

Using a "bottom-up" approach complete the diagram below. Start by identifying the major spatial issues and work your way up.

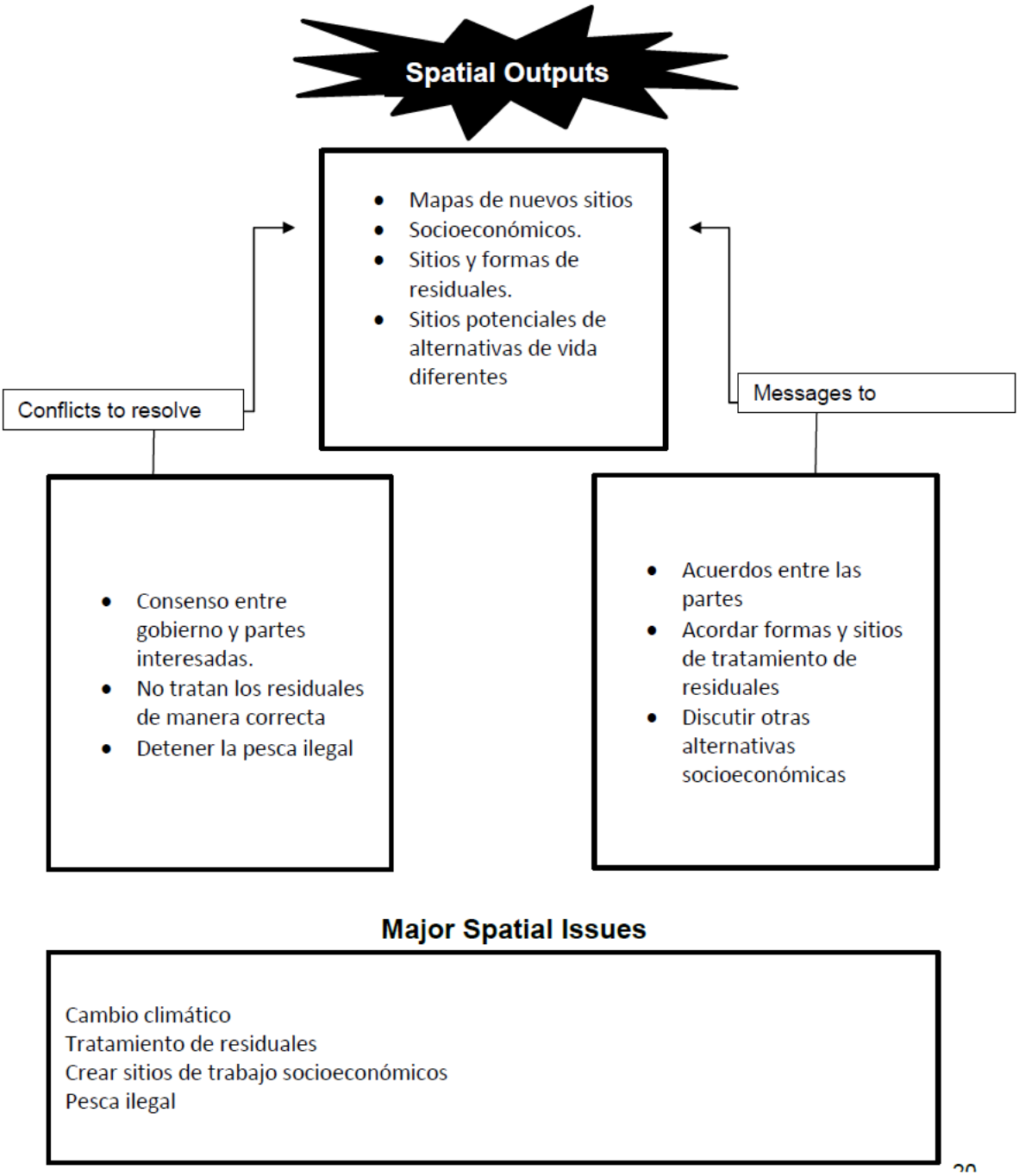


Ilustración 2

17 Work plan schedule

A SocMon study should take no more than one month (at most 6 weeks), so you need to schedule your work accordingly, remembering the SocMon stages including validation. For the purposes of this training workshop, set out tasks under each heading for the implementation of the SocMon assessment at the chosen study area. Provide an estimate of the number of /weeks required for each task.

Activity / task Week →	**1**	**2**	**3 Jul**	**4 Ago**	**5 Sep**	**6 Oct**	**7 Nov**	**8 Dic**	**9 Ene**
Preparatory activities									
logística			X	X					
Partes involucradas			X						
Consulta con las partes y nivel de participación			X	X					
Identificación de variable y equipo de trabajo			X	X					
Secondary data collection									
Revisión de bibliografía			X						
Revisión de datos			X						
Primary data collection and observation									
Encuestas, entrevistas, talleres con gobierno local y comunidad					X	X			
Data analysis and interpretation									
Montaje de los datos							X		
Análisis de los datos							X	X	
Validation, communication, adaptation									
								X	X

Notes:

18 Critical research resources required (budget and non-budget)

Many resources will be used in the research, but there are usually just a few that are so critical the assessment may not be able to proceed without them. You must know early what these are.

Resource description	Use of resource	Comments on availability
Combustible	Movilidad hacía la comunidad	Fácil acceso para la compra
Alojamiento/Alimentación	Estancia en la comunidad	Disponible y fácil acceso

19 Budget

The SocMon methodology is intended to be affordable so that monitoring can be sustained. Pay close attention to what are realistic costs, including in-kind contributions that may be available.

Description of expense	No. of units	Unit cost*	Total cost*
Contratación en especie	7	-	-
Materiales de oficina			
Transporte	-	-	300.00
Combustible	-	-	200.00
Alojamiento/Alimentación	-	-	500.00
Equipamiento digital	-	-	-
Capacitación del staff	-	-	-
Análisis de datos	-	-	-
Elaboración de documental	1	-	1500.00
Elaborar materiales comunicativos impresos	2	-	2000.00
Difundir por medios masivos	-	-	-
		Sum total of SocMon costs	4500.00

* = currency used [ ]

Budget explanatory notes (use if needed to explain calculations/estimations)

El proyecto no tiene presupuesto definido

APPENDIX 5: WORKSHOP EVALUATION FORM

Building Capacity for Coral Reef and Human Dimensions Monitoring
Port Royal Marine Laboratory, The UWI-Mona, Jamaica, 10-14 October 2017
A workshop under the framework of UN-Environment Caribbean Environment Programme
and in collaboration with the SPAW Regional Activity Centre

Participant Evaluation of the
Socio-economic Monitoring for Coastal Management (SocMon) Training Workshop

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Directions: Please rate how much you agree or disagree with each of the statements listed below.

The **goal** of this workshop was to prepare participants to increase and improve the use of socio-economic information in coastal management decision-making by stakeholders using integrated processes.

1. The goal for this workshop was fully achieved.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

There were **three objectives** associated with this goal to be achieved by workshop participants:

- To introduce socio-economic monitoring using SocMon Caribbean methods illustrated by Caribbean sites and experiences.
- To encourage participants to use SocMon for monitoring in coastal management.
- To provide practical experience in planning and implementing site monitoring.

2. The first objective of this workshop (introduction to SocMon Caribbean methods) was fully achieved.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

3. The second objective of this workshop (encourage use of SocMon for monitoring in coastal management) was fully achieved.

___ strongly agree
___ agree
___ neither agree nor disagree

Page 1 of 4

___ disagree
___ strongly disagree
___ I don't know

4. The third objective of this workshop (practical experience in planning and implementing site monitoring) was fully achieved

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

5. My own (personal) expectations for why I attended this workshop were fully achieved.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

6. The SocMon Preparatory Activities Worksheets were useful in planning site monitoring.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

7. SocMon Spatial integrates well into the SocMon Preparatory Activities Worksheets.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

8. If I had to recommend that some changes be made to the SocMon Preparatory Activities Worksheets, they would be: (list/write)

9. The workshop was well organised.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

10. The workshop was well facilitated.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

11. I would recommend my colleagues to attend a workshop similar to this one.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

12. My abilities as a coastal/resource management professional (or stakeholder or student) have been improved as a result of this workshop.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

13. I enjoyed participating in this workshop.

___ strongly agree
___ agree
___ neither agree nor disagree
___ disagree
___ strongly disagree
___ I don't know

14. The things I liked most about this workshop were: (list/write)

15. The things I liked least about this workshop were: (list/write)

16. If I had to recommend that some changes be made to the workshop, they would be: (list/write)

17. Other thoughts, comments, or suggestions?