Common Socio-economic Monitoring Indicators for Caribbean Challenge MPAs

Common Socio-economic Monitoring Indicators for Caribbean Challenge MPAs

Comunes de los Indicadores Socioeconómicos de Monitoreo para el Caribe Desafío AMP

Indicateurs de Suivi Communs Socio-économiques pour les Caraïbes Défi AMP

MARIA PENA, PATRICK McCONNEY, and KATHERINE BLACKMAN
CERMES, University of the West Indies, Cave Hill Campus, Barbados

ABSTRACT

The *Socio-economic monitoring by Caribbean Challenge MPA Managers* project (CC SocMon project) implemented by the Centre for Resource Management and Environmental Studies (CERMES), at the University of the West Indies, Cave Hill Campus, has been increasing the capacity for effective Marine Protected Area (MPA) management among Caribbean Challenge countries through promoting the use of social and economic monitoring data in MPA decision-making. Specific project outcomes include thirty-two trained MPA practitioners and seven initiated site assessment and monitoring programs across three Caribbean Challenge countries (Grenada, St. Vincent and the Grenadines and St. Lucia. CC SocMon MPA site assessments and monitoring are varied and have focused on differing socio-economic aspects of MPAs including determining current and potential alternative livelihood options and opportunities for MPA communities; collecting socio-economic data to inform management planning; identifying perceptions of changes and impacts that will accompany the introduction of management planning; collecting data on impacts, attitudes and perceptions trends of communities within and surrounding MPAs; determining MPA awareness; collecting data to guide strategies to mitigate the impacts of planned development on MPAs; and developing core indicators to assist with decision-making and effective management of MPAs.This paper reports on common socio-economic indicators chosen and developed by CC SocMon project sites and assesses those which stand out as being the most useful or feasible to measure.

KEY WORDS: Socio-economic monitoring indicators, Caribbean Challenge, MPAs

SOCIO-ECONOMIC MONITORING FOR COASTAL MANAGEMENT

Socio-economic Monitoring for Coastal Management (SocMon) is a global initiative of the IUCN World Commission on Protected Areas (WCPA-Marine), Global Coral Reef Monitoring Network (GCRMN) and the National Oceanic and Atmospheric Administration (NOAA). The initiative is being implemented at the global and regional levels with the goal of establishing socio-economic coastal and marine monitoring programmes globally at the site level (Bunce et al. 2000, Bunce and Pomeroy 2003).

Coastal resources can no longer be managed from a biophysical focus alone. In order to sustainably manage coastal resources, managers must balance sustainable use, resource protection and conservation with community needs for food security, livelihoods and equitable use of resources. An understanding therefore of human interactions with, and dependence on coastal resources, as well as the socio-economic context of the community is critical (Bunce et al. 2000, Bunce and Pomeroy 2003). SocMon is aimed at helping coastal managers better understand and incorporate the socio-economic context of coastal resource use by various stakeholders into coastal management programs. This is essential for assessing, predicting and managing coastal resource use over time. SocMon is a globally networked, regionally adapted, practical methodology of socio-economic monitoring for coastal management. Globally, six regions are successfully conducting SocMon (with the West Africa SocMon region under development) – the Caribbean, Central America, Pacific Islands, South Asia, South East Asia and the Western Indian Ocean. SocMon works through regional and local partners to facilitate community-based socio-economic monitoring.

SocMon is a set of guidelines for establishing a socio-economic monitoring program at a coastal management site. Each of the regions conducting SocMon have a set of region-specific guidelines for socio-economic monitoring. The guidelines provide a prioritised list of socio-economic variables useful to coastal managers as well as the questions for data collection and tables for data analysis. The guidelines are not rigid and can be tailored to each site's need (Bunce and Pomeroy 2003). There are sixty socio-economic variables that may be used in assessment or monitoring and they are presented in the guidelines according to the means of data collection – key informant interviews and/or secondary sources, and surveys – and are represented by K and S preceding the variable number. The variables are categorised according to type. Key informant and secondary sources variables are categorized according to community-level demographics, community infrastructure and business development, coastal and marine activities and governance. Survey variables are categorized according to household demographics, coastal and marine activities, attitudes and perceptions and, material style of life.

The guidelines provide detailed information on each of the variables – What it is; How to collect it; How to analyse it; and How the results can be useful to managers. In April 2011, an addendum to the regional SocMon and Socio-economic Monitoring for Coastal Managers in the Pacific (SEM-Pasifika) guidelines was published. These guidelines provide an additional set of ten socio-economic indicators related to climate change. These can be included in a socio-economic assessment or monitoring program at any site for which climate change impacts are an important issue. The resulting

information can then inform coastal management needs and adaptive management (Wongbusarakum and Loper 2011). Due to the flexibility of the methodology, new variables for assessment and monitoring may be designed according to site need. Prioritization of variables for measurement according to goal and objectives for assessment or monitoring, the general importance to data collection and site-specific conditions is recommended.

Due to the adaptability of the SocMon methodology to each site's needs, there is little limitation in site assessment or monitoring goals and objectives. The drawback to this is that comparison of data between and among sites may be difficult. Therefore, the development of a core set of variables applicable to coastal management sites at the sub-regional or regional level may overcome this difficulty and accordingly facilitate the scaling up of coastal management decisions in some cases.

SOCIO-ECONOMIC MONITORING BY CARIBBEAN CHALLENGE MARINE PROTECTED AREA MANAGERS

Project Background

The Socio-economic monitoring by Caribbean Challenge MPA Managers project (CC SocMon project) implemented by the Centre for Resource Management and Environmental Studies (CERMES), at the University of the West Indies, Cave Hill Campus, has been increasing the capacity for effective Marine Protected Area (MPA) management among Caribbean Challenge countries through promoting the use of social and economic monitoring data in MPA decision-making.

Small Island Developing States (SIDS) of the Wider Caribbean are highly dependent on coastal living spaces and livelihoods based on coastal resources (Loper et al. 2008, McConney 2003). Caribbean MPAs have succeeded to varying degrees in achieving ecological objectives, but have struggled to gain acceptance from stakeholders (often for socio-economic reasons) and effectively implement management measures. Little attention has been paid to the impact of MPAs and management interventions on adjacent communities who rely on the resources within MPAs – impacts that may help explain some of the problems MPAs have had with implementation and compliance (Garraway and Esteban 2002, Geoghegan et al. 2001, Loper et al. 2008). An understanding of human interactions with and dependence on coastal resources as well as the socio-economic context of the community is essential for assessing, predicting and managing coastal resource use (Bunce and Pomeroy 2003). Tools such as the SocMon Caribbean methodology provide coastal managers with an understanding of the social, economic, cultural and political characteristics and conditions of individuals, households, groups, organizations and communities. Socio-economic information can help coastal managers identify potential problems, mitigate negative impacts and focus management priorities accordingly (Bunce and Pomeroy 2003, Loper et al. 2008) to achieve management objectives.

Despite many projects, Caribbean MPA management authorities with small staffs struggle with inadequate capacity to manage most MPAs in the region. This is in part due to the fact that most of the regional, national and local agencies responsible for MPA management, do not have the training or skills required to achieve effective biodiversity conservation and successfully manage the areas under their supervision (Ebanks 2009, MacLeod 2007, McConney and Pena 2007, Parsram 2007, Pena 2006, Roach 2007). Strengthening skills and knowledge, to manage protected areas adaptively is critical to preventing and/or arresting degradation of natural resources and ensuring sustainable livelihoods for those dependent on these resources. Consultation with representatives of the MPA community in the eight islands associated with the Caribbean Challenge Initiative at a meeting hosted by the Caribbean Marine Protected Areas Management (CaMPAM) Network at the 63rd Gulf and Caribbean Fisheries Institute (GCFI), Puerto Rico, 1 – 5 November 2010 indicated the need for capacity building in socio-economic monitoring for the development of an effective regional system of MPAs.

This need for MPA capacity building in socio-economic assessment and monitoring was previously identified in a regional training needs assessment (Parsram 2007) and most recently in the Gombos et al. (2011) MPA management capacity assessment. This is particularly important since most MPAs in the region focus mainly on ecological monitoring despite provisions in management plans, and research and monitoring frameworks for socio-economic assessment and monitoring (e.g. Soufriere Regional Development Foundation 1994). For some MPAs such as the Tobago Cays Marine Park (TCMP), Sandy Island Oyster Bed MPA (SIOB MPA), Pitons Management Area (PMA) and Point Sable Environmental Protection Area (PSEPA) the need for continuous socio-economic monitoring has been neglected in the management plans (De Beauville-Scott and George 2003, Gardner 2009, Hoggarth 2007, TNC and Grenada Fisheries Division 2007). This critical deficiency must be addressed. MPAs also focus on enforcement and surveillance, administration and public education rather than monitoring. When monitoring occurs, it tends to be bio-physical (De Beauville-Scott 2003, McConney and Pena 2007, Pena 2006, Roach 2007; Steve Nimrod, Molinere-Beausejour Marine Protected Area, Grenada, Personal communication; OlandoHarvey, Tobago Cays Marine Protected Area, St. Vincent and the Grenadines, Personal communication).

The Caribbean Challenge Initiative (unprecedented commitment by Caribbean governments to support and manage new and existing national parks and protected areas throughout the region) and regional training in SocMon through this project provide a major opportunity for uptake of SocMon for achieving improved MPA management capacity and therefore conservation of coastal

resources. With strengthened capacity for management through socio-economic monitoring MPA managers, authorities and field staffs will also increase their capacity for adaptive management through learning-by-doing. The objectives of the project include:

i) Training approximately 40 MPA managers/staff, from three CC countries (Grenada, St. Vincent and the Grenadines and St. Lucia), in the practical use of SocMon Caribbean methods via three country-specific workshops,
ii) The initiation of eight site assessment and monitoring programs (three in Grenada, two in St. Vincent and the Grenadines, three in St. Lucia) for coastal management with technical assistance and advice provided by CERMES,
iii) Documentation of training and monitoring processes, making them available to a worldwide audience and CERMES communications for replication, with improvement, in future rounds of SocMon activity, and
iv) Submission of data to the Reef Base Socio-Economic global database and CaMPAM database for uptake

The project is funded by a National Fish and Wildlife Foundation (NFWF) Coral Reef Conservation Fund grant (USD 126,000). Originally one year in duration (September 2011 to 31 August 2012), the project has received a no-cost extension to February 2013. Specific project outcomes include thirty-two trained MPA practitioners and seven (six individual sites and one combination of two) initiated site assessment and monitoring programs across three Caribbean Challenge countries (Grenada, St. Vincent and the Grenadines and St. Lucia).

Goals and Objectives for Site Assessment or Monitoring

CC SocMon MPA site assessments and monitoring are varied and have focused on differing socio-economic aspects of MPAs including determining current and potential alternative livelihood options and opportunities for MPA communities; collecting socio-economic data to inform management planning; identifying perceptions of changes and impacts that will accompany the introduction of management planning; collecting data on impacts, attitudes and perceptions trends of communities within and surrounding MPAs; determining MPA awareness; collecting data to guide strategies to mitigate the impacts of planned development on MPAs; and developing core indicators to assist with decision-making and effective management of MPAs (see Table 1).

Table 1. Goals and objectives for socio-economic assessment or monitoring by MPA.

Country	MPA	Goals and objectives
Grenada	Molinière/ Beauséjour MPA	*Goal:* To assess the feasibility of alternative livelihood options for the communities surrounding the Molinière/ Beauséjour Marine protected Area ((MBMPA). *Objectives:* To assess how the MPA impacts livelihoods of the communities in the area. To strengthen community participation in MPA management and MPA.ownership based on examining potential linkages between resource protection and livelihoods. To identify the socio-economic conditions that will enable alternative livelihood options: tourism and its related development.
	Woburn/ Clarke's Court Bay MPA	*Goal:* To determine the changes and impacts, particularly those related to yachting, that accompany the introduction of management planning to the WCCB MPA Objectives: To determine what changes in the WCCB area are perceived by the major stakeholder groups due to the introduction of management. To determine whether changes are perceived as positive or negative, equitable or not, from a socio-economic perspective. To determine the direct and indirect impacts of the yachting sector to WCCB and identifysocio-economic benefits of Marinas. To integrate socio-economic monitoring indicators into the evaluation of management effectiveness during management planning.
	Sandy Island/ Oyster Bed MPA	*Goal:* To determine impacts, and attitudes and perceptions trends of the Sandy Island/Oyster Bed Marine Protected Area (SIOBMPA), on persons living and working in communities adjacent to the MPA. *Objectives:* To obtain MPA stakeholder feedback on the MPA management process, impacts and effectiveness of management activities within the protected area before and after the establishment of the MPA. To determine the current conditions of the coastal and marine resources. To identify the specific uses of the MPA and its resources by households within the adjacent communities.

Table 1 (continued).

St. Vincent and the Grenadines	Tobago Cays Marine Park	*Goal:* To develop a core set of socio-economic indicators to assist with decision-making and the effective adaptive management of the TCMP. *Objectives:* To determine stakeholder perceptions of changes in the conditions of the marine resources since the re-launch of the TCMP in 2006. To determine the level of stakeholder participation and satisfaction in the management of the TCMP since the re-launch of the TCMP in 2006. To determine the perceptions of stakeholders on the level of enforcement, compliance and protection (security) within the TCMP since the re-launch of the TCMP in 2006.
	South Coast Marine Conservation Area	*Goal:* To collect socio-economic data to inform management planning of the South Coast Marine Conservation Area *Objectives:* To identify a core set of socio-economic indicators for assessing change in resource conditions and patterns of use over the next 3-5 years. To identify a range of socio-economic uses/use patterns in the SCMCA. To determine stakeholders awareness, attitudes and perceptions of the coastal and marine resources in the SCMCA. To measure the impact of management arrangements on stakeholders livelihoods and the area's natural resources.
St. Lucia	Pointe Sable Environmental Protection Area	*Goal:* To determine the extent to which the people in the Vieux-Fort community are aware of a) the Pointe Sable Environmental Protection Area (PSEPA) as a protected area and b) the various current and potential livelihood opportunities which exist in the area *Objectives:* To determine the level of awareness of the existence of the PSEPA. To determine the level of awareness of the current livelihoods and potential livelihood opportunities which exist within the PSEPA. To determine the number of households currently benefitting(economically) from the PSEPA.
	Soufriere Marine Management Area and Pitons Management Area (combination site)	*Goal:* To collect data to inform/guide strategies to mitigate the socio-economic impacts of planned development within the Pitons Management Area (PMA) and the Soufriere Marine Management Area (SMMA). *Objectives:* To determine perceived threats of planned development within the SMMA and PMA by residents and other users. To determine the level and extent of use of the PMA and the SMMA by residents and other users. To identify potential management solutions to address impacts identified.

SocMon Variables Chosen by Site for Data Collection

Once site monitoring plans had been prepared by the sites and approved by CERMES for implementation, SocMon teams determined preferred methods to be used for data collection. For the purposes of this paper, we pay attention to the key informant interview and household survey instruments used. However it should be noted that sites are still in the process of gathering data and will use additional methods of gathering information such as secondary sources of data and visualization techniques such as maps. Based on the goals and objectives of the site assessment or monitoring, SocMon teams determined the most appropriate SocMon Caribbean variables to be measured. Variables were chosen from the original set of 60 SocMon Caribbean variables, however, for all sites, new variables had to be designed and developed in order to accurately capture information that could not have been obtained using the original key informant and survey SocMon variables provided in the guidelines. This paper reports on common socio-economic variables chosen and developed by the CC SocMon project sites and assesses those which stand out as being the most useful or feasible to measure.

A total of 57 variables were chosen for assessment among the sites, 24 key informant variables and 33 survey variables. Of these, 14 new key informant variables and 15 survey variables were developed. Revision of two key informant variables and three survey variables was recommended for collecting and measuring some of data required for the studies. Twelve key informant variables and 18 survey variables were shared among sites. Six newly developed variables were applicable as both key informant and survey variables and were used to collect similar data (Tables 2 and 3).

Table 2. Key informant variables chosen according to site.
Variables used at more than one site (potentially comparable) are shaded.

Variable Number	Variable	Grenada		St. Vincent & the Grenadines	St. Lucia
		MBMPA	WCCBMPA	SCMCA	PSEPA
K12	Occupation	I			
K14	Activities			I	I
K15	Goods and services				I
K16	Types of use				I
K17	Value of goods and services			I	I
K19	Use patterns			I	
K20	Levels and types of impacts		I	I	
K23*	Stakeholders	I	I	I	
K31*	Stakeholder participation	I	I		
K33**	MPA changes or impacts	I	I	I	
K34**	Management support	I	I		
K35**	Critical activities for management intervention		I		
K36**	Perceptions of resource conditions (adopted - original survey variable S16)		I	I	
K37**	Perceived threats (adopted - original survey variable S17)		I	I	
K38**	Perceived changes in activities and uses		I	I	
K39**	Perceived MPA benefits		I		
K40**	MPA knowledge and awareness	I	I	I	I
K41**	Business and service provision	I	I		I
K42**	Types of interactions		I		
K43**	Livelihood trends, enhancement and vulnerabilities	I			
K44**	Alternative livelihoods				I
K45**	Best practices		I		
K46**	Perceived management responsibility			I	

*Variables recommended for revision
**New variables
Hatched shading – variables applicable as both key informant and survey variables

Description of Revised and New Variables Developed during SocMon

Following the format used to present the SocMon variables in the SocMon Caribbean guidelines (Bunce et al. 2003), the development of new SocMon variables involved defining the variables by name, developing descriptions of the variable and how to collect the data, providing an explanation of how to analyze the data and discussion of how the information could be useful to MPA managers. For revision of original variables, variable names were not changed but instead descriptions, methods of data collection, explanations for data analysis and importance of the data to managers were modified. Due to space limitations here, only those revised and new variables with a "popularity" rating of 3 and 4, that is, those variables shared by three and four MPA sites, are described below. N.B. Survey variables with a rating of five were original SocMOn Caribbean variables. For brevity, the sample of revised and newly developed variables is presented in Tables 4 and 5 according to name, description and usefulness. It is hoped that in the future the detailed information on the complete set of these variables (revised and newly designed) will be made available for sharing and uptake via the SocMon website (www.socmon.org), CERMES website (http://cavehill.uwi.edu/cermes) and or possibly as an addendum to the current SocMon Caribbean guidelines as MPA-specific SocMon Caribbean variables.

Table 3. Survey variables chosen according to site. Common variables among sites are shaded.

Variable Number	Variable	Grenada	St. Vincent and the Grenadines		St. Lucia	
		SIOB	TCMP	SCMCA	SMMA/PMA	PSEPA
S1	Age	I	I	I	I	I
S2	Gender	I	I	I	I	I
S4	Education	I	I	I	I	I
S7	Occupation	I		I	I	I
S8	Household size		I		I	I
S9	HH income	I	I			I
S10	HH activities	I		I	I	
S16*	Perceptions of resource conditions	I	I	I		
S17*	Perceived threats	I		I		
S18	Awareness of rules and regulations		I	I		I
S19	Compliance		I			I
S20	Enforcement		I			
S21*	Participation in decision-making		I			
S23	Perceived coastal management problems	I	I			
S24	Perceived coastal management solutions	I	I			
S25	Perceived community problems		I			
S26	Successes in coastal management	I	I			
S27	Challenges in coastal management	I				
S29**	MPA knowledge and awareness	I	I	I		I
S30**	Types and changes in MPA livelihoods	I	I	I		I
S31**	Alternative livelihoods					I
S32**	HH MPA livelihoods	I			I	I
S33**	MPA changes or impacts	I	I	I		
S34**	Perceived management responsibility			I		
S35**	Management priorty(ies)	I				
S36**	Sector development and sector impacts					I
S37**	Knowledge and perceptions of physical development, impacts and negative impact reduction				I	
S38**	Perceived responsibility for impact reduction				I	
S39**	Best practices		I			
S40**	Perceived MPA benefits			I		
S41**	MPA user frequency and type of MPA uses(s)		I		I	
S42**	Use patterns (adopted – original key informant variable K19)			I		
S43**	Perceptions of changes in species abundance		I			

* Original SocMon variables recommended for revision
**New variables
Hatched shading – variables applicable as both key informant and survey variables

Table 4. Description of a sample of "popular" revised and newly developed key informant variables.

Key informant variables			
Variable Number	**Variable name**	**What it is**	**How the information can be useful to managers**
K23*	Stakeholders	Stakeholders interested, involved or affected by coastal resource management (original) Stakeholders who would like to be involved in management (revised) Stakeholder willingness to participate in management (revised) How should stakeholders be involved in management (revised) Ways of encouraging participation in management (revised)	Identification of individuals or groups that may be impacted by management measures and addressing the impacts with stakeholders (original) Identification of stakeholders who have a vested interest in MPA management and decision-making (revised) Identification of potential champions for MPA management (revised) Understanding ways in which stakeholders can be involved in management to get useful inputs (revised) Understanding ways in which managers can encourage stakeholder participation in management and decision-making (revised) *All important for gaining buy-in and support for management*

Table 4 (continued).

K33**	MPA changes or impacts	Positive and/or negative effects or impacts of the MPA and its management on stakeholders and resource users Includes changes or impacts on uses, activities and livelihoods as a result of management measures	Identification of vulnerable groups, those that are most impacted by management interventions Identification of threats to the local community and dependency on MPA resources Determination of issues critical for scientific study (e.g. diversification of occupational and income structure, alternative livelihoods). Critical in guiding the direction of, and adaptation of MPA management. Examination of the impact of management on stakeholders and for evaluating management effectiveness.
K40**	MPA knowledge and awareness	General understanding of people about MPAs, protection and sustainable use of MPA resources How informed stakeholders are about a specific MPA and its purpose/objectives. The variable also measures people's perceptions of education efforts made by MPA management, government and non-government agencies (NGOs and community groups) towards raising awareness about the MPA and its resources The variable also measures what people think should be done to improve or increase MPA awareness	Critical for developing awareness programs Important for encouraging stakeholder participation in management and support for the MPA. Important for influencing MPA compliance and management Information on education/awareness-raising efforts is useful to managers in identifying the level of outreach and information dissemination occurring and any changes that may need to be made to such

Table 5. Description of a sample of "popular" revised and newly developed survey variables.

		Survey variables	
Variable Number	**Variable name**	**What it is**	**How the information can be useful to managers**
S16*	Perceptions of resource conditions	The original variable measures what people think about the condition of coastal and marine resources of the MPA. The variable can measure both current and past conditions The variable should also measure expected changes in resource condition after introduction of management - what changes in the condition of resources do people expect once management is implemented	Useful for identifying threats to coastal and marine resources. Monitoring perceived changes in resource condition could also indicate success and effectiveness of management through management interventions (change in people's attitudes and perceptions). Information on perceived and expected changes is critical for developing awareness programs and seeking stakeholder participation Developing biophysical research and monitoring programs guided by stakeholder knowledge
S29**	MPA knowledge and awareness	General understanding of people about MPAs, protection and sustainable use of MPA resources How informed stakeholders are about a specific MPA and its purpose/objectives. The variable also measures people's perceptions of education efforts made by MPA management, government and non-government agencies (NGOs and community groups) towards raising awareness about the MPA and its resources The variable also measures what people think should be done to improve or increase MPA awareness	Critical for developing awareness programs Important for encouraging stakeholder participation in management and support for the MPA. Important for influencing MPA compliance and management Information on education/awareness-raising efforts is useful to managers in identifying the level of outreach and information dissemination occurring and any changes that may need to be made to such

Table 5 (continued).

S30**	Types of and changes in MPA livelihoods	Ways in which people make a living from MPA resources This variable also measures seasonality of livelihoods People's perceptions of or knowledge of changes in MPA livelihoods due to MPA management or external factors (such as physical development)	Indication of the degree of people's dependency on the MPA and its resources. This is critical to informing the manager about heavily utilized resources that may require management intervention to improve their condition as well as impacts management may have on earning power (such as livelihood displacement). Changes in MPA livelihoods may inform managers about the impacts certain management actions have had on people living in communities adjacent to the MPA Seasonality of MPA livelihoods can provide information on occupational structure of and help MPA managers tailor management programmes
S32**	HH MPA livelihoods	Ways in which household members make a living from the resources in and around MPAs	Indication of the degree of dependency of households on the MPA and its resources. Critical to informing the manager about heavily utilized resources that may require management intervention to improve their condition Important in determining impacts management may have on household earning power
S33**	MPA changes or impacts	Positive and/or negative effects or impacts of the MPA and its management on stakeholders, households and resource users Includes changes or impacts on uses, activities and livelihoods as a result of management measures	Identification of vulnerable groups, those that are most impacted by management interventions Identification of threats to the local community and dependency on MPA resources Determination of issues critical for scientific study (e.g. diversification of occupational and income structure, alternative livelihoods). Critical in guiding the direction of, and adaptation of MPA management. Examination of the impact of management on stakeholders and for evaluating management effectiveness.

POPULARITY POTENTIAL FOR USING VARIABLES FOR COMPARISON AMONG SITES

Popularity of Variables and Feasibility for Measurement

The frequency of the variables chosen by each site was quantified by rating each variable. A rating score of 1 – 5 was used to indicate the number of sites using the variable of relevance. The 'popularity' of variables across sites is illustrated in Figures 1 and 2.

Based on the "popularity" ratings for the variables shown above, the key informant variables that stand out as most feasible to compare are those related to coastal and marine activities, governance, knowledge and awareness, business and service provision (Table 6). For surveys the variables are: household demographics, coastal and marine activities, attitudes and perceptions, knowledge and awareness, livelihoods and governance (Table 7). Note that some variable categories have been specifically developed to group newly designed variables.

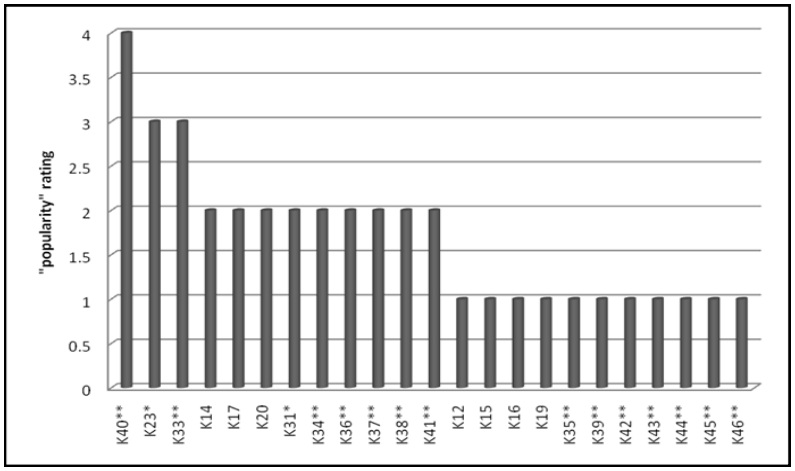

Figure 1. "Popularity" of key informant variables chosen by all sites.

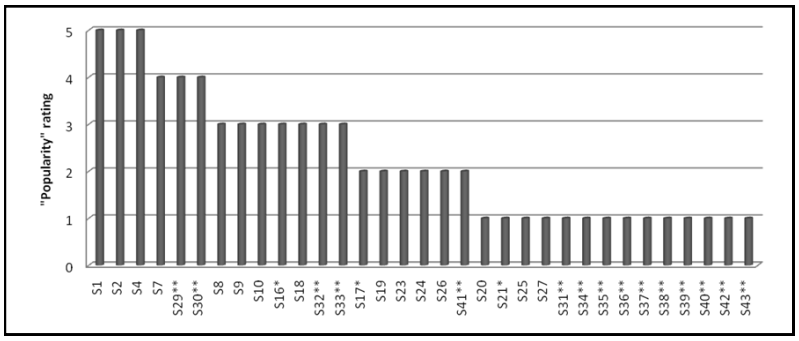

Figure 2. "Popularity" rating of survey variables chosen by all sites.

Table 6. Key informant variables most feasible to measure by type.

Category	Variable
Coastal and marine activities	K14 Activities
	K17 Value of goods and services
	K20 Levels and types of impacts
	K23* Stakeholders
	K33** Management changes or impacts
Governance	K31* Stakeholder participation
	K34** Management support
	K36** Perceptions of resource conditions
	K37** Perceived threats
	K38** Perceived changes in activities and uses
Knowledge and awareness	K40** MPA knowledge and awareness
Business and service provision	K41** Business and service provision

* Original SocMon variables recommended for revision
**New variables

Table 7. Survey variables most feasible to measure by type.

Category	Variable
Household demographics	S1 Age
	S2 Gender
	S4 Education
	S7 Occupation
	S8 Household size
	S9 Household income
Coastal and marine activities	S10 Household activities
	S41** MPA user frequency and type of MPA use(s)
Attitudes and perceptions	S16 Perceptions of resource conditions
	S17 Perceived threats
	S18 Awareness of rules and regulations
	S19 Compliance
	S23 Perceived coastal management problems
	S24 Perceived coastal management solutions
	S26 Successes in coastal management
Knowledge and awareness	S29** MPA knowledge and awareness
Livelihoods	S30** Types of and changes in MPA livelihoods
	S32** Household MPA livelihoods
Governance	S33** MPA changes or impacts

* Original SocMon variables recommended for revision
**New variables

Potential for Comparison Among Sites

Due to similarity in variables chosen, questions asked and sampling designs that include similar stakeholders among the Caribbean Challenge MPA sites, there are a number of variables that can be potentially qualitatively and quantitatively compared. The opportunity therefore exists for building a sub-regional socio-economic picture of Caribbean Challenge MPAs and regional MPAs in general.

Generally, goals and objectives for monitoring vary according to site and as such drive the selection of variables for the SocMon process. However based on the "popularity" of specific variables identified in this project, the potential exists for development of a core set of variables or indicators that can be rapidly monitored in future rounds of SocMon by each site in addition to other goals and objectives. A standardized key informant interview and survey could be developed for rapid SocMon assessment or monitoring ("SocCheck") using the most popular variables as a base. Sustained monitoring using this core set of variables will provide valuable data for determination of trends, changes, and MPA management effectiveness within and among sites. All of these can be used to inform and adapt MPA management.

The uptake of a core set of variables for building a socio-economic picture of these MPAs is further made possible by this project since the potential for the development of local and even transboundary SocMon networks (in the case of Grenada and St. Vincent and the Grenadines) exists. The latter is especially probable with the establishment in January 2011 of the Grenadines Network of Protected Areas comprising, the Sandy Island/Oyster Bed (SIOB) MPA, Molinère/Beauséjour (MB MPA) and Tobago Cays Marine Park (TCMP). The establishment of these SocMon networks should enable collaboration among sites to enhance socio-economic monitoring and promote the incorporation of SocMon (and a core set of SocMon variables) in MPA monitoring and research frameworks. Further, the investigation in the future of developing a database of core sets of variables used for assessment and monitoring at regional MPAs could make the aggregation and manipulation of data easier for comparison among sites.

Comments on New Directions for SocMon

The use of SocMon in the Caribbean is approaching its 10-year anniversary and as such, the current SocMon Caribbean variables should be evaluated to determine applicability and relevance to present coastal and marine resource management. As illustrated in this project some of the original SocMon variables have been recommended for revision in order to allow the measurement of critical information issues. This may also be true of some of the other original variables.

With the exception of the use of socio-economic data collected during monitoring at the Negril Marine Park (NMP) in Jamaica, to address information needs for the first Fisheries Management Plan (FMP) for the NMP (Blackman 2005), there has been little feedback as to how SocMon data have been used to inform and adapt management in SocMon study areas (Loper et al. 2008). Sustained socio-economic monitoring using the SocMon Caribbean methodology and the use of SocMon data to guide policy-making is not typical at coastal management sites in the region although coastal managers recognize the importance of collecting socio-economic data. Whether this reflects a deficiency in follow-up or whether monitoring was not sustainable in the first place is debatable. Additionally, due to the lack of fully functional integrated coastal management decision-making mechanisms in the SocMon study areas in the Caribbean, it is not clear if or how the socio-economic information will be used in coastal management in the region. The evolution of SocMon is therefore important.

There is potential to expand the SocMon methodology at the spatial level using geographic information systems (GIS) and core sets of variables, both existing and to be developed, (specific to fisheries, MPAs, etc.) to answer questions about the success of coastal management and to build a sub-regional and/or regional profile of coastal management sites in the Caribbean. Linking SocMon with GIS provides the opportunity for mapping and visualizing trends, attitudes and perceptions, and changes at appropriate geographic scales that could promote the uptake of SocMon at sites and the use of SocMon to inform and adapt management and guide policy. The development of SocMon Spatial will be investigated by CERMES.

LITERATURE CITED

Blackman, K. [2005]. Information for the Negril Marine Park's Fisheries Management Plan. Unpublished Ms. Centre for Resource and Environmental Studies, University of the West Indies, Cave Hill Campus, Barbados. 100 pp.

Bunce, L., P. Townsley, R. Pomeroy, and R. Pollnac. 2000. *Socioeconomic Manual for Coral Reef Management*. Australian Institute of Marine Science, Townsville, Australia. 251 pp.

Bunce, L. and R. Pomeroy. 2003. *Socioeconomic monitoring guidelines for coastal managers in the Caribbean (SocMon Caribbean)*. Australian Institute of Marine Science, Townsville, Australia. 91 pp.

DeBeauville-Scott, S. and S. George 2003. *Pitons Management Area management Plan*. Saint Lucia World Heritage Committee and The World Heritage Fund. 83 pp.

Ebanks, A.E., M. Miller, and R. Mahon. 2009. Best Management Practices for Marine Protected Areas of the Wider Caribbean Region. CERMES Technical Report No 19. Centre for Resource Management and Environmental Studies. 40 pp.

Garaway, C. and N. Esteban. 2002. The impact of marine protected areas on poorer communities living in and around them: Institutional opportunities and constraints. Appendix 5 – Case study of Negril Marine Park, Jamaica. December 2002. MRAG Ltd., London, UK. 37 pp.

Gardner, Lloyd. 2009. Management Plan for the Pointe Sable Environmental Protection Area, 2009-2014. Government of Saint Lucia. 86 pp.

Geoghegan, T., A.H. Smith, and K. Thacker. 2001. Characterization of Caribbean marine protected areas: An analysis of ecological, organisational and socio-economic factors. CANARI Technical Report Nº. 287 pp.

Gombos, M., A. Arrivillaga, D. Wusinich-Mendez, B. Glazer, S. Frew, G. Bustamante, E. Doyle, A. Vanzella-Khouri, A. Acosta, and B. Causey. 2011. A Management Capacity Assessment of Selected Coral Reef Marine Protected Areas in the Caribbean. Commissioned by the National Oceanic and Atmospheric Administration (NOAA) Coral Reef Conservation Program (CRCP), the Gulf and Caribbean Fisheries Institute (GCFI) and by the UNEP-CEP Caribbean Marine Protected Area Management Network and Forum (CaMPAM). 269 pp.

Hoggarth, D. 2007. Tobago Cays Marine Park (TCMP) 2007-2009 Management Plan Revised November 2007 Draft. Prepared for the Organisation of Caribbean States (OECS) Environment and Sustainable Development Unit (ESDU), St. Lucia. 100 pp.

Loper, C., R. Pomeroy, V. Hoon, P. McConney, M. Pena, A. Sanders, G. Sriskanthan,S. Vergara, M. Pido, R. Vave, C. Vieux and I. Wanyonyi. 2008. Socioeconomic conditions along the world's tropical coasts: 2008. National Oceanic and Atmospheric Administration (NOAA), Global Coral Reef Monitoring Network (GCRMN) and Conservation International (CI). 56 pp.

MacLeod, P. 2007. Grenada's National Protected Areas System capacity development. Final draft Plan. July 2007. United States Agency for International Development and The Nature Conservancy. 53 pp.

McConney, P., R. Pomeroy and R. Mahon. 2003. Guidelines for coastal resource comanagement in the Caribbean: Communicating the concepts and conditions that favour success. Caribbean Coastal Comanagement Guidelines Project. Caribbean Conservation Association, Barbados. 56 pp.

McConney, P and M. Pena. 2007. Final Technical Report. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize Report No. 15. 22 pp.

Parsram, K. 2007. Protected areas planning and management regional training needs assessment. OECS Protected Areas and Associated Livelihoods Project. 73 pp.

Pena, M. 2006. Report on Management Effectiveness at the Tobago Cays Marine Park (TCMP), St. Vincent and the Grenadines. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize. Report No. 5. 59 pp.

Roach, D. 2007. Report on Evaluating Management Effectiveness at the Negril Marine Park (NMP), Jamaica. CERMES Regional Project on Enhancing Management Effectiveness at Three Marine Protected Areas in St. Vincent and the Grenadines, Jamaica and Belize Report No. 7. 68 pp.

The Nature Conservancy and Grenada Fisheries Division. 2007. Sandy Island/Oyster Bed Marine Protected Area, Management Plan, US Virgin Islands. 100 pp.

Wongbusarakum, S. and C. Loper. 2011. Indicators to assess community-level social vulnerability to climate change: An addendum to SocMon and SEM-Pasifika regional socio-economic monitoring guidelines. April 2011. First draft for public circulation and field testing. 41 pp.