Socio-economic Conditions in the Caribbean: Scrutinizing SocMon Caribbean Data

Las Condiciones Socioeconómicas en las Zonas Marinas Protegidas en el Caribe: Escrutando SocMon Proyectos del Caribe de Datos

Les Conditions Socio-économiques au MPA dans les Caraïbes : Scrutant SocMon Caraïbes Projets Informatiques

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ABSTRACT

A number of socio-economic assessments and monitoring programmes have been implemented at coastal management sites and communities throughout the Caribbean as components of Global Socio-economic Monitoring Initiative for Coastal Management (SocMon) projects implemented by the Centre for Resource Management and Environmental Studies, at The University of the West Indies, Cave Hill Campus, Barbados. Goals and objectives for assessment and monitoring have focused on differing socio-economic aspects of coastal communities and coastal management sites such as MPAs including collection of baseline data; informing MPA and fisheries management and planning; promoting the use of socio-economic data in fisheries and MPA management; developing socio-economic profiles of fisheries; and enhancing the management capacity of stakeholders. This paper describes the process used to statistically examine data from nineteen individual SocMon project sites collected from 2005 to 2013 in order to build a socio-economic picture of coastal management sites and communities in the English-speaking Caribbean. This will be useful in developing a baseline of regional socio-economic conditions from which future changes could be measured.

KEY WORDS: Socio-economic monitoring variables, Caribbean, coastal management

BACKGROUND

Since the establishment of the Global Socio-economic Monitoring Initiative for Coastal Management (SocMon) in 2003, the number of sites at which socio-economic monitoring has been conducted in the English-speaking Caribbean has steadily increased. After the inauguration of the SocMon Caribbean methodology in 2003 the regional SocMon node for the English-speaking Caribbean, the Centre for Resource Management and Environmental Studies (CERMES) at the University of the West Indies, Cave Hill Campus, implemented a number of grant funded SocMon projects. These projects have been primarily funded by the United Nations Environmental Programme-Caribbean Environment Programme (UNEP-CEP), National Oceanic and Atmospheric Administration (NOAA) Coral Reef Conservation Programme and the National Fish and Wildlife Foundation (NFWF). In addition to grant funded projects, graduate students of The University of the West Indies have conducted MSc research using the SocMon Caribbean methodology. The reference section contains a list of project reports and MSc research that covers the last decade.

Socio-economic monitoring has been implemented in 11 countries in the region at 19 study sites, 13 of which have been Marine Protected Area (MPA) sites and seven at coastal community sites, particularly fishing villages. Goals and objectives for monitoring are usually tailored to each site's needs and have focused on a variety of socio-economic aspects of these sites. Sample survey sizes for SocMon studies have ranged from 26 to 290 respondents, with studies comprising one to 10 communities. Project and research profiles of SocMon study studies being analysed are outlined in Table 1.

Currently, there are six regions around the world conducting socio-economic monitoring through the SocMon Initiative – Caribbean, Central America, Western Indian Ocean, South Asia, Southeast Asia and the Pacific Islands. During the period over which the projects and MSc research studies were conducted there has been only one attempt at aggregating regional SocMon site assessments globally across the six regions using SocMon. The synthesis undertaken by Loper et al. (2008) focused on SocMon assessments conducted at 49 sites globally with the primary goal of enhancing the global and regional understanding of human interactions with and dependence on coastal resources. The analysis for the Caribbean comprised eight countries and nine sites, the majority of which were MPA sites. Our analysis in this paper includes a more in-depth examination of all socio-economic monitoring conducted between 2005 and 2013. It will attempt to analyse socio-economic data measured by similar SocMon variables across the region in order to build a socio-economic picture of coastal management sites and communities in the English-speaking Caribbean. This will be useful in developing a baseline of regional socio-economic conditions against which future changes could be measured.

Table 1. SocMon project/MSc research profiles of Caribbean study sites.

Study type	Year	Country	Study site(s)	Monitoring goals
Project				
UNEP-CEP	2005/2006	Anguilla	Shoal Bay/Island Harbour Marine Park	To collect and document baseline socio-economic data of the Shoal Bay-Island Harbour Marine Park
		Antigua	Cades Bay Marine Reserve	To protect and conserve the resources of CBMR; To develop strategies that can be used in other MPAs in Antigua and Barbuda; To detect changes in social and economic conditions within CBMR; Creating a shared vision of development within CBMR
		Carriacou, Grenada	Sandy Island/Oyster Bed MPA	To gather baseline SocMon data to assess and monitor the main activities within the Sandy Island/ Oyster Bed area, to include, fishing, diving and recreation.
		Jamaica	Montego Bay Marine Park	To inform the development of management strategies for the Montego Bay Marine Park, based on a survey of stakeholder attitudes and perceptions.
		St. Lucia	Soufriere Marine Management Area	To determine the social and economic factors affecting the SMMA inorder to tailor management strategies to suit the current socio-economic climate.
Fisheries SocMon* NOAA funded	2009/2010	Barbados	Oistins	To monitor the impacts of present and proposed development in Oistins on its fisheries-based culture
		Dominica	Colihaut, Dublanc, Bioche	To monitor impacts of present and proposed development with a view to ensure sustainable use of the resource base of the Dublanc, Bioche, and Colihaut communities.
		Grenada	Nine east coast settlements - comprising primarily fishing villages	To assess the stakeholders in coastal settlements.
		St. Kitts and Nevis	The Narrows	To collect socio-economic data to inform marine conservation and development decision-making.
		St. Vincent and the Grendines	Rose Place	To gather baseline socio-economic information, in order to inform development decision-making and enhance the environmental condition of Rose Place.
Caribbean Challenge SocMon** NFWF funded	2011-2013	Carriacou, Grenada	Sandy Island/Oyster Bed MPA	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.
		Grenada	Molinière/Beauséjour Marine protected Area	To assess the feasibility of alternative livelihood options for the communities surrounding the Molinière/Beauséjour Marine protected Area (MBMPA).
Project				
Caribbean Challenge SocMon** NFWF funded	2011-2013	Grenada	Woburn/Clarke's Court Bay MPA	To determine the changes and impacts, particularly those related to yachting, that accompany the introduction of management planning to the WCCBMPA.
		St. Lucia	Pointe Sable Environmental Protection Area	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.
		St. Lucia	Soufriere Marine Management Area and Pitons Management Area	To collect data to design strategies to mitigate the socio-economic impacts of planned development within the Pitons Management Area (PMA) and the Soufriere Marine Management Area (SMMA).
		St. Vincent and the Grenadines	South Coast Marine Conservation Area	To collect socio-economic data to inform management planning of the South Coast Marine Conservation Area.
		St. Vincent and the Grenadines	Tobago Cays Marine Park	To develop a core set of socio-economic indicators to assist with the effective management of the TCMP.

Table 1. (continued)

Study type	Year	Country	Study site(s)	Monitoring goals
MSc research				
Blackman, K	2005	Jamaica	Negril Marine Park	To inform fisheries management planning at the Negril Marine Park
Franklin, G	2007	British Virgin Islands	Anegada, Tortola, Jost Van Dyke and Virgin Gorda	Determination of the socio-economic importance of the lobster fishery of the British Virgin Islands
Gill, D	2007	St. Vincent and the Grenadines	Grenadines Islands	To acquire socio-economic information on fisheries in the Grenadines for future use in fisheries and integrated coastal management decision-making.
Mannette, K	2005	Tobago	Speyside	To investigate the factors that contribute to an environmental education strategy for the Speyside community.

* Fisheries SocMon: Socio-economic Monitoring by Caribbean Fishery Authorities
** Caribbean Challenge SocMon: Socio-economic Monitoring by Caribbean Challenge MPA Managers

METHODS

Raw data from projects and MSc research were collected from project partners and authors for inventorying, data mining and editing (where necessary). Where raw data were not available or accessible, relevant data were extracted from site monitoring reports. Project and MSc research profiles were compiled in an Excel spreadsheet according to CERMES project/MSc research, year of initiation, country, study site(s), goals and objectives for monitoring and SocMon variables monitored – key informant/secondary sources and survey. SocMon uses 60 variables for monitoring – 32 for collecting socio-economic data from secondary sources and/or key informants and 28 for collecting socio-economic data through surveys (Bunce and Pomeroy 2003). In 2011, 10 climate change SocMon variables were added to the suite of original variables (Wongbusarakum and Loper 2011).

In two additional spreadsheets, key informant/ secondary source and survey variables were inventoried according to study site to determine the variables that were shared among sites (Figure 1). Variables chosen for site monitoring had to be identified for most sites by reviewing the relevant data collection instruments used (key informant interview guides and surveys) and linking questions for primary data collection or information provided by secondary sources to relevant variables. In some cases, particularly research by Gill (2005) and the Caribbean Challenge SocMon project, variables chosen by sites for monitoring had been tabulated by the authors and presented within reports, which made the process of variable inventorying easier.

Due to the low use of key informant/secondary sources SocMon variables across study sites, our analysis focuses only on survey variable data. Each SocMon survey variable was assigned a score or popularity rating based on the number of sites monitoring the specific variable. Since nineteen study sites are being analysed, any SocMon survey variable with a popularity rating of nine or more (i.e. monitored at nine or more sites) has been included in the analysis (Table 2). As such, fourteen variables have been chosen for analysis – six measuring household demographics, three measuring coastal and marine activities, four measuring attitudes and perceptions and one measuring material style of life. Generally, household demographic SocMon variables were chosen by the majority of sites that implemented socio-economic monitoring programmes, being selected by 16 sites on average. Coastal and Marine Activities variables as well as Attitudes and Perceptions variables were chosen by more than half of the sites, with an average of 11 sites measuring each of these categories of variables. Material Style of Life was monitored by 10 sites (Table 2).

Upon selection of SocMon variables most commonly monitored among sites, raw data, where available, were extracted and compiled in a series of Excel spreadsheets according to variable. Where raw data were not available, statistical information on each variable of interest was extracted from site monitoring reports. Due to the complexity of the data from multiple sites, statistical methods for application to the combined data across sites are now being determined, and the generation of results is a work in progress.

LIMITATIONS AND CHALLENGES OF THE ANALYSIS

As noted by Loper et al. (2008), due to the nature of the SocMon process (Bunce et al. 2000), the opportunity for combining standardized data at the regional level is limited. Since the SocMon methodology is flexible with monitoring tailored to site needs, data standardization and therefore statistical analysis is challenging due to a number of reasons including:

i) Varied goals and objectives for monitoring which inform the selection of variables, resulting in differences in variables chosen for monitoring across sites;

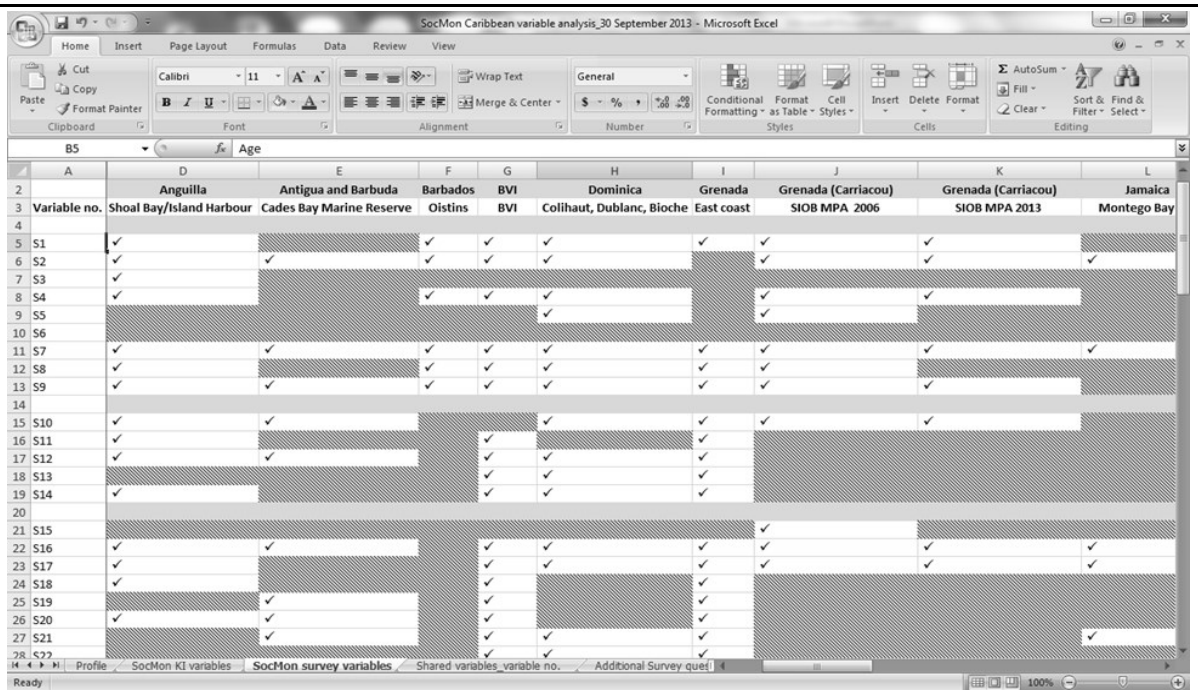

Figure 1. Screen shot of a section of the SocMon survey variable inventory by site

Table 2. Survey variable popularity rating

	Variable	Popularity rating
Household demographics		
S1	Age	17
S2	Gender	17
S3	Ethnicity	3
S4	Education	15
S5	Religion	5
S6	Language	0
S7	Occupation	16
S8	Household size	13
S9	Household income	17
Coastal and marine activities		
S10	Household activities	14
S11	Household goods and services	7
S12	Types of household uses	9
S13	Household market orientation	5
S14	Household uses	9
Attitudes and perceptions		
S15	Non-market and non-use values	6
S16	Perceptions of resource conditions	15
S17	Perceived threats	13
S18	Awareness of rules and regulations	9
S19	Compliance	7
S20	Enforcement	7
S21	Participation in decision-making	9
S22	Membership in stakeholder organisations	7
S23	Perceived coastal management problems	7
S24	Perceived coastal management solutions	6
S25	Perceived community problems	2
S26	Successes in coastal management	5
S27	Challenges in coastal management	3
Material style of life		
S28	Material style of life	10

ii) Differing sampling design resulting in non-comparable data even when the information on the same variables is collected;
iii) Small response sample sizes, especially when less than 30, may be challenging for analysis;
iv) Lack of standardized questions used in primary data collection; questions are usually crafted differently among sites based on education level of the community and local colloquialisms. Therefore, differences in coding used for survey responses among sites makes combining and comparing data as well as determination of appropriate statistical methods for analysis challenging;
v) Exclusion of data in monitoring and research reports. Even though variables may have been chosen for monitoring in the various SocMon studies, the data collected on these variables may not be stated in reports. Therefore where raw data are not available, this results in a loss of data for aggregation.

IMPORTANCE OF SCRUTINIZING SOCMON CARIBBEAN DATA

Although results are currently unavailable it is useful to note the potential importance of this analysis and how its outputs may be employed. The detailed examination and combination of data collected in SocMon Caribbean projects and research will be important for a number of reasons including:

i) Developing an understanding of the socio-economic context of coastal resource use and dependence on coastal and marine resources in the

region which is necessary in assessing, predicting and managing resource use over time. The information is therefore critical to building a regional socio-economic picture of coastal management sites and communities in the Caribbean.

ii) Fine-tuning knowledge of the regional socio-economic context of coastal sites and communities at the sub-regional level through clustering of country sites with similar socio-economic characteristics and conditions.

iii) Determining the statistical significance of current regional data and making recommendations for improvements to allow greater comparability in the future. Statistically representative data are crucial to reliably informing resource management and decision-making.

iv) Identifying a core set of variables that should be included in regional socio-economic monitoring to further enhance the development of the regional socio-economic context of fisheries, MPAs and other coastal management sites. That is, introducing a component of standardization to the SocMon Caribbean methodology to allow comparison of data across sites.

v) Assessing datasets for coding challenges at the regional level as well as storage of SocMon Caribbean data, providing recommendations for standardizing both for ease of interpretation and sharing in future replications of SocMon.

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