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Authors	Pena, M.; Blackman, K.; Hanson, C.; McConney, P.; Miller, M.
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Socioeconomic Information for Managing Fisheries in the Negril Marine Park

MARIA PENA¹, KATHERINE BLACKMAN¹, CARL HANSON²,
PATRICK McCONNERY¹, and MAULDEN MILLER³

¹*Centre for Resource Management and Environmental Studies
UWI, Cave Hill Campus, Barbados*

²*Negril Coral Reef Preservation Society
Negril, Jamaica*

³*Caribbean Regional Environment Programme
Negril, Jamaica*

ABSTRACT

The Negril Marine Park (NMP) was declared a marine protected area (MPA) in 1998. It comprises 160 square kilometers of coral reefs, seagrass beds, mangroves, beaches and cliffs at the western end of Jamaica, and is the marine component of the larger Negril Environmental Protection Area (EPA) that includes five watersheds and a major wetland (the Great Morass). The NMP is co-managed by the Negril Coral Reef Preservation Society (NCRPS), a multi-stakeholder non-governmental organization, under a delegation instrument signed by the government of Jamaica in 2002. Government policy emphasizes effective conservation and sustainable livelihoods as key management goals. Fishing is second only to tourism as the major marine economic activity in the NMP. However, many habitats are severely degraded, and the park is heavily fished in inshore areas by people suspected to be living in or near poverty. Research was conducted in 2004 and 2005 to incorporate socioeconomic information on these people into the first fisheries management plan (FMP) for the NMP. The SocMon Caribbean methodology was used. This included secondary data analysis, interviews with key informants, a survey of households in ten settlements in and bordering the NMP, and validation workshops to confirm the findings with participants while promoting stakeholder involvement in management. Information on education, perceptions of resource status, management responsibility and participation, communication, interactions between fisheries and tourism and among fishers, income sources and livelihood strategies were incorporated into the fisheries management plan. Incorporating socioeconomic information in marine protected area and fisheries management is highly recommended, especially in situations where conservation decisions are likely to impact negatively on livelihoods, and mitigation measures or alternatives need to be developed with the resource users.

KEY WORDS: Fisheries, MPA, Negril, socioeconomic

Información Socioeconómica para el Manejo de Pesquerías en el Parque Marino de Negril

El Parque Marino de Negril (PMN) fue declarado area marina protegida (AMP) en 1998. Se compone de 160 kilometros cuadrados de arrecifes de coral, pastos marinos, manglares, playas y acantilados que se encuentran en el lado oeste de Jamaica, y es el componente marino de una extensa Area Protegida Ambiental de Negril que incluye siete cuencas hidrográficas y un extenso humedal (el Great Morass). El PMN es co-manejado por la Sociedad para la Preservación de Arrecifes de Coral de Negril (NCRPS), una organización no gubernamental compuesta de multi –usuarios, bajo un instrumento de delegación firmado por el gobierno de Jamaica en el 2002. Las políticas gubernamentales enfatizan efectiva conservación y subsistencia sostenible como metas claves de manejo. Despues de turismo la pesca es la mayor actividad económica marina en el PMN. Sin embargo se observa degradacion severa de varios habitats, y la parte costera del parque se encuentra bajo pesca extensiva por parte de pobladores que se sospecha viven en o casi en pobreza extrema. Se condujo una investigación en 2004 y 2005 para incorporar información sobre estos pobladores dentro del primer plan de manejo de pesca (PMP). Se utilizo la metodología de SocmMon caribeño. Esto incluyó análisis de datos secundarios, entrevistas con informantes claves, sondeo de hogares en diez asentamientos dentro y alrededor del PMN, y taller de validación a fin de confirmar los hallazgos con los participantes en tanto se promueve el involucramiento de usuarios en el manejo. Información sobre educación, percepción del estatus de los recursos, participación y responsabilidad en el manejo, comunicación, interacción entre pesca y turismo y entre otros pescadores, fuente de ingreso y estrategias de subsistencia fueron incorporados dentro del plan de manejo de pesca. Incorporar información socioeconómica dentro del APM y manejo de pesca es muy recomendable, especialmente en situaciones donde las decisiones respecto a conservación están sujetas a impactar negativamente en la subsistencia, y alternativas o medidas de mitigación necesitan ser desarrollados en conjunto con los usuarios.

PALABRAS CLAVES: Pesca, APM, Negril, socioeconómico

INTRODUCTION

World renown for its long white sand beaches, Negril is a resort town located at the western end of Jamaica. It evolved from an area of rural community tourism in the early 1960s into a premier mass tourism destination, home to large hotel chains, some of which are all-inclusive (Christophersen *et al.* 1997, Otuokon 1997, Jones Williams 2000, Otuokon 2001, Thacker and Hanson, 2003). Negril is Jamaica's third largest tourist area and is reputed to generate more income than either of the other two major resort areas, Ocho Rios and Montego Bay (Otuokon 2001). Growth and development of the area have brought benefits for many but at considerable costs to the environment (Goreau *et al.* 1995). Negril's natural resources, which are the very attractions being promoted, have been degraded mainly due to the rapid and expansive development of the tourist area without systems to protect its resources (Thacker and Hanson 2003). Land-based pollution and natural impacts have caused a decline in the health of habitats and abundance of desirable marine species (Christophersen *et al.* 1997).

In response to concerns that Negril's coral reefs were being negatively impacted by an increase in tourist-related activities, the Negril Coral Reef Preservation Society (NCRPS) was established in 1990 by a group of scuba divers and dive operators (Otuokon 2001, Garaway and Esteban 2002, Thacker and Hanson 2003). The NCRPS is a non-profit, non-governmental, charitable organisation. Initially, the primary goal of the NCRPS was to protect the coral reefs from further decline through the elimination of anchor damage due to increasing numbers of recreational boats in the area and to create a national marine park. However, this was later expanded to include efforts at whole watershed and reef management (Otuokon 2001, Garaway and Esteban 2002, Thacker and Hanson 2003).

Study Site

It was recognised that the establishment of a conservation area that would regulate land use, institute and implement terrestrial and marine public parks, and manage the preservation of Negril's natural resources was required (Otuokon 2001, Garaway and Esteban 2002, Thacker and Hanson 2003). In 1997, the first Environmental Protection Area (EPA) in Jamaica, the Negril EPA, was established. It comprises five watersheds, one major wetland (the Great Morass), and the Negril Marine Park (NMP). The NMP was legally established in 1998, encompassing an area of approximately 160 km², the boundaries of which extend from Davis Cove on the north coast to St. John's Point in the south and seaward from the high water mark to the deep water drop off (NEPT, NRCA and NGIALPA 1997, CARECO 2001, Geoghegan *et al.* 2001, Otuokon 2001, Richards 2001, O'Sullivan 2002, NCRPS 2003, Thacker and Hanson 2003). (Figure 1).

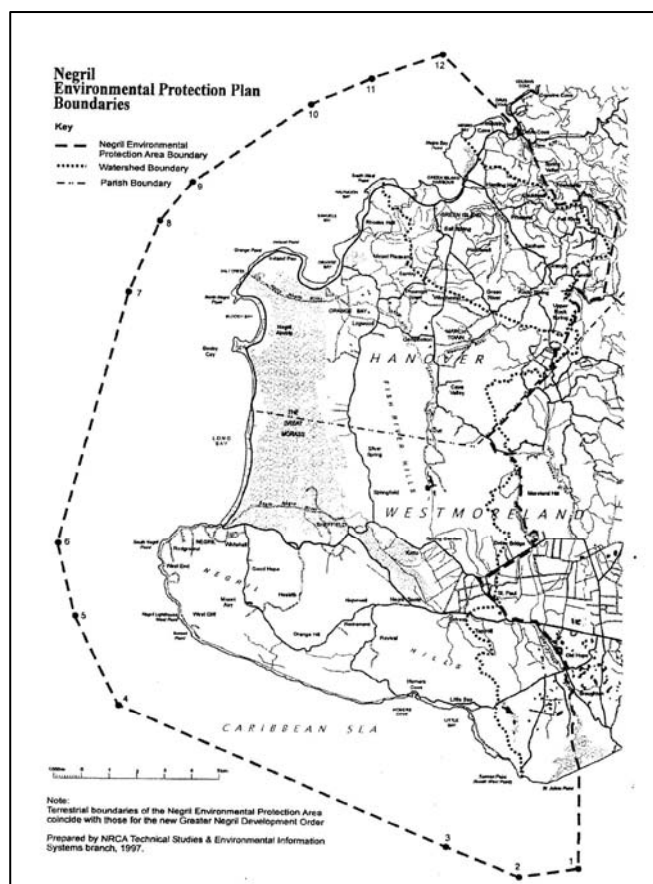


Figure 1. Environmental Protection Area including the Negril Marine Park.

The objective of the NMP is to preserve the natural marine and coastal resources to protect their health and integrity while simultaneously allowing sustainable economic and social development within the Negril EPA (Thacker and Hanson 2003). The NMP has been divided into eight zones (swimming, non-motorized craft, motorized craft, diving, replenishment, fishing, anchorage, and no fly) that are yet to be comprehensively demarcated.

The main recreational activities within the NMP are waterskiing, scuba diving, snorkelling, sunset cruises, parasailing, jet skiing, artisanal, and recreational fishing. Activities of the NMP and surrounding areas in order of socio-economic importance are tourism, fishing and farming (Goreau *et al.* 1995, Christophersen *et al.* 1997, Jones Williams 2000, Otuokon *et al.* 2000, Geoghegan *et al.* 2001, Francis 2002, Garaway and Esteban 2002, O'Sullivan 2002).

Management of the Negril Marine Park

In 2002 the Natural Resources Conservation Authority (NRCA) delegated management of the NMP to the NCRPS. The Delegation Instrument sets out the terms of management including obligations and functions of the parties involved and details the framework of implementa-

tion (NRCA 2002). According to this agreement, the NCRPS must "develop, implement and monitor plans and programmes" for the marine park that are in keeping with the Marine Park Management Plan with activities related to public awareness, research, and training. The NCRPS is also to revise the Management Plan as appropriate, in collaboration with the National Environment and Planning Agency (NEPA), and act as an advisor to the NRCA on policy issues concerning the park's natural resources. The delegation is for a five-year term, renewable on agreement by both parties.

Following consultations of various types (meetings with key stakeholders, government, and private sector representatives, and workshops), a management plan, operations plan and business plan were formulated by the NCRPS during the period 1997 to 2003 for the NMP. The overall aim of the management plan is to guide the management team of the NMP in directing and implementing the programmes and activities necessary for the protection and preservation of the marine and coastal ecosystems within the boundaries of the Park for the sustainable benefit of Negril and Jamaica (Otuokon 1997, Thacker and Hanson 2003). The expansion of tourism, agriculture, logging, and fishing has been placing pressure on the NMP environment (Garaway and Esteban 2002). Since there are numerous varied threats to marine environmental health in the NMP with implications for management, the management plan assumes a multi-faceted approach comprising 12 programmes each with management objectives. These programmes address administration, disaster preparedness and emergency management, education, enforcement, financial sustainability, lobbying, public relations, research and monitoring, resource management, sustainable community development, visitor management, and zoning issues (Otuokon 1997, Thacker and Hanson 2003).

Fisheries Management Planning and Socioeconomic Monitoring at the NMP

Overfishing has impacted on the NMP with heavy fishing occurring in inshore areas by people suspected to be living in or near poverty (Espeut and Grant 1990, Geoghegan *et al.* 2001). Fishery data suggest deterioration in the condition of all resources that the NMP attempts to protect (Garaway and Esteban 2002). In 2000, the NCRPS reported a dramatic decline in fish stocks in Negril. Other research indicated low levels of fish abundance with very few large fish and small sizes of few commercially important species in and adjacent to the NMP (Otuokon 1997, Garaway and Esteban 2002, O'Sullivan 2002). A significant impact on the size of the fish catch due to destructive fishing techniques such as seining, spearfishing and dynamiting has also been observed (Christophersen *et al.* 1997). Many fishermen within the boundaries of the NMP use fish traps or pots having smaller mesh than the size required by law. Some fish are caught before they

have a chance to mature and reproduce (NCRPS 2003). Evidence suggests that stocks are not recovering.

Of special relevance is the resource management programme of the NMP management plan, particularly the third objective: the improvement of fish stocks within the NMP through implementation of a Fisheries Management Plan (FMP) for the marine park. Related to this programme is the NMP's sustainable community development programme, one objective of which is to support and implement training programmes that promote projects designed to sustain the community economically and protect the resources. Our paper focuses on the socioeconomic information on Negril fisheries required for the formulation of the marine park's first FMP.

In general, the benefits that most fisheries produce diminish if there is no proper management. Since management of natural resources requires people, and it is the people who ultimately either mismanage or sustainably manage natural resources, then approaches to fisheries management which involve stakeholders and use social science are desirable (Berkes *et al.* 2001). Local community attitudes towards, and the uses of, coastal resources have serious implications for the health of coastal marine systems. Simultaneously, the management of coastal resources has equally significant implications for the socioeconomic health of the community. Socioeconomic information is crucial for effective coastal management (Bunce and Pomeroy 2003) and hence, should be incorporated in fisheries management planning (Berkes *et al.* 2001).

Socioeconomic monitoring can help us to understand the contexts of coastal resource use by various stakeholders. This is essential for assessing, predicting and managing coastal resource use over time (McConney 2005). SocMon is a set of guidelines for establishing a socioeconomic monitoring programme useful for coastal management at the site level. These guidelines (Bunce and Pomeroy 2003) provide a prioritized list of socioeconomic variables useful to coastal managers as well as questions for data collection and the tables for data analysis and are used in combination with the *Socioeconomic Manual for Coral Reef Management*.

METHOD

Following extensive review of the secondary data available on the Negril area, 88 household surveys were conducted by the NCRPS in 2005 to gather further information on ways to improve management in the NMP. The convenience sample was not designed to be statistically representative, but mainly to provide better understanding of perceptions, practices, and attitudes. The surveys were conducted in 10 fisheries-oriented communities within and adjacent to the NMP: Little Bay, Savanna-la-mar, Lucea, Orange Bay, Salmon Point, Green Island, Brighton, Broughton, South Negril, and Davis Cove. Survey data analysed via SPSS and EXCEL provided

descriptive statistics. These results were presented at workshops with the interviewers and fisheries stakeholders (including fisheries officials, NCRPS, Caribbean Regional Environmental Programme (CREP)) for comments and to gain their input on how this information will assist management of the NMP. Data and information considered to be relevant to fisheries management were selected for incorporation into the FMP.

RESULTS

Demographics

Most of the respondents (95%) were male and over 40 years old with primary school education (56%). Over 35% of the respondents were Pentecostal, 15% were Roman Catholic, and 10% were Seventh Day Adventist.

Perceptions of Resource Status

The state of the coastal and marine resources (inshore and offshore reefs, mangroves, seagrass beds, and beaches) has declined over the years. The majority of the respondents believe that ten years ago both the inshore and offshore reefs were in very good condition, but are now in very bad shape (Figure 2).

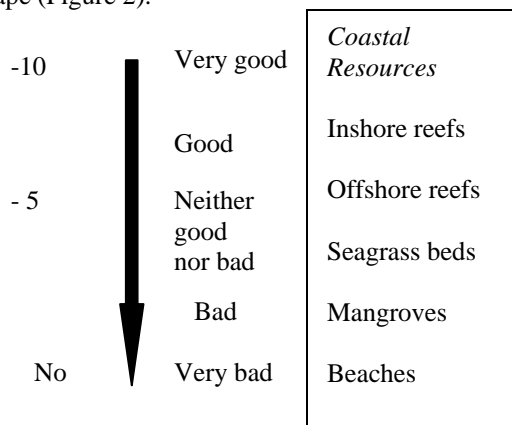


Figure 2. Worsening state of coastal resources over the past 10 years.

Management Responsibility and Participation

Most of the respondents believed that the NCRPS (71%), government (65%) and resource users (64%) were the three main groups responsible for solving problems of the park; while Negril Green Island Area Local Planning Authority (NGIALPA) and parish councils were thought to have the least responsibility (Figure 3). The government was suggested as being the most responsible for taking decisions for managing the marine park (37%). Thirty-six percent believed that NCRPS was the second most responsible followed by resource users (15%). Respondents (36%) believed they had little influence on management; 26% had none while 25% believed they had some

influence (Figure 4). 51% of respondents did not participate in NMP management. The main reason for their lack of participation (according to 58%) was due to not being informed. Of the respondents, 22% would be motivated to participate if they were aware of the meetings; 12% would be motivated if benefits were provided; while 14% would not be motivated at all.

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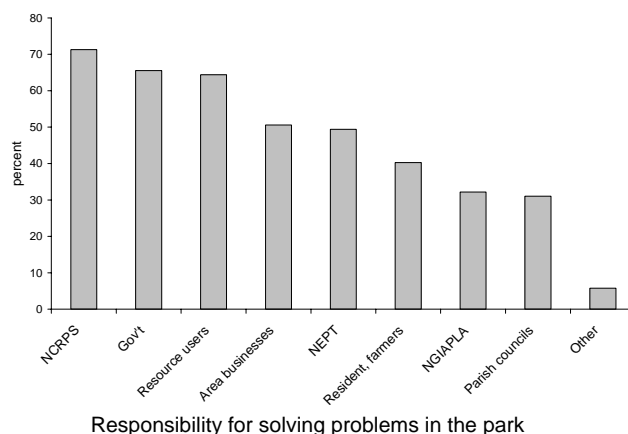


Figure 3. Responsibility for solving problems of the park.

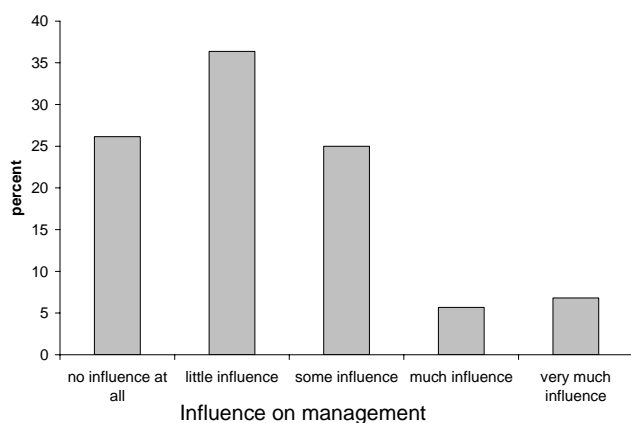


Figure 4. Comparison of influence on management.

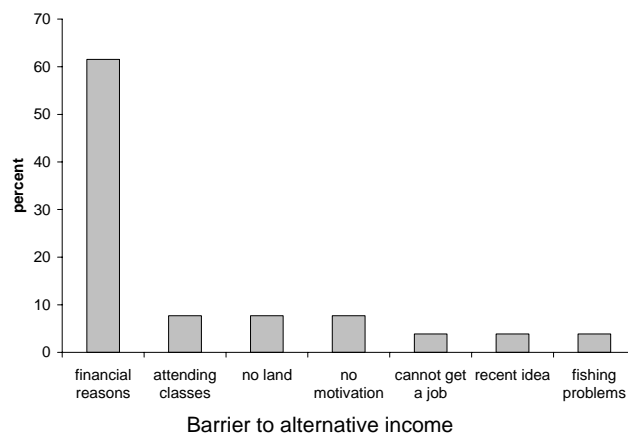


Figure 6. Barriers to achieving alternative income.

Communication

Twenty-six percent of the respondents suggested multiple methods for disseminating information about the NMP to the public; but 20% suggested the television to be the best source of information. Thirty percent believed the telephone was the most successful means of informing the NCRPS about NMP issues; while 20% suggested a visit to the office.

Income Sources and Livelihoods Strategies

The majority of respondents were fishers (76%) and have no secondary occupation (Figure 5). Eighty percent of the respondents had no other sources of income. In terms of alternative income generation strategies, 23% of respondents would like to get into tourism; however 39% had no other alternative income generation strategies. The barrier to this alternative income is mainly financial reasons (60%) (Figure 6). Most of the respondents (88.2%) were not involved in training for alternative occupations (Figure 6). Thirty five percent believe that training is not necessary, while 25% said no opportunity existed for them and 13% noted that age constraints prohibited them from participating in job training.

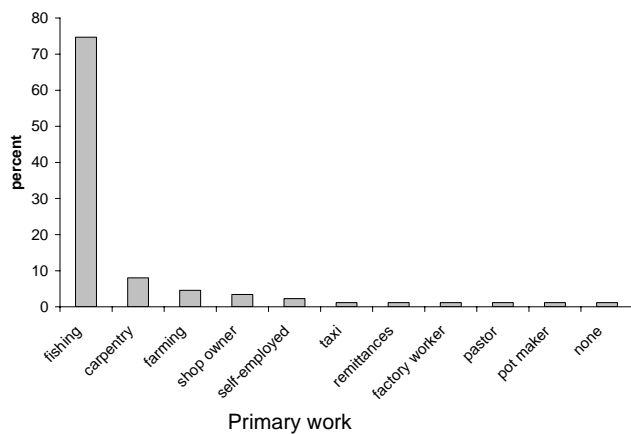


Figure 5. Primary work of respondents.

Interactions Between Fishers and Tourism

Most of the respondents (92%) believed that fishing and tourism were compatible activities within the NMP. Of that 92%, 51% believed both were compatible as they provided income and employment. The largest response (38%) believed the amount of tourism in the NMP was just right. Similarly, they (52%) believed the amount of fishing was just right (Figure 7).

Most of the respondents (67%) believed that fishers could work together among themselves to solve fishery problems in the marine park. Means of cooperation included sharing ideas (56%) and holding discussion meetings (15%). Thirty-six percent of respondents stated that fishers would be unable to work together among themselves to solve fishery problems in the marine park without assistance and supervision.

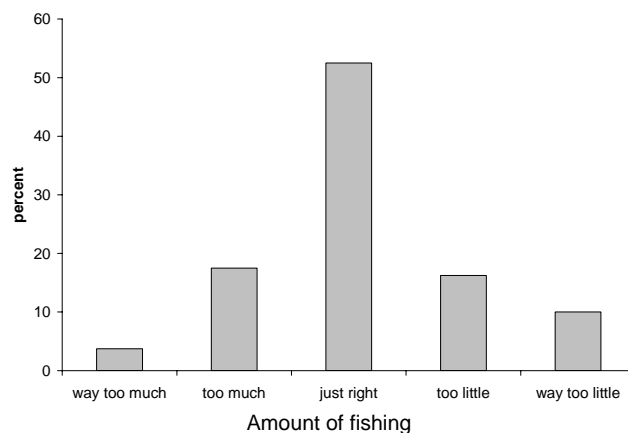


Figure 7. Perception of amount of fishing throughout the settlement in the NMP.

DISCUSSION

There has been no pro-active management of fisheries in the NMP. With the exception of sparse commercial fish landing data, and annual Reef Check monitoring initiated in 2001, detailed surveys of the fishery resources in the NMP have not been conducted on a regular basis. However, Christophersen *et al.* note that the Plan for Managing the Marine Fisheries of Jamaica (1997) and discussions with Negril fishermen indicate that several species are targeted depending on the location and time of the year. Numerous studies have noted that size and type of catch have declined mainly as a result of habitat degradation and increased fishing pressure (Espeut and Grant 1990, Aiken 1991, Christophersen *et al.* 1997, Otuokon 1997, Garaway and Esteban 2002, O'Sullivan 2002). Without suitable management interventions fish stocks will continue to decline, thus ensuring that the objective of the NMP will not be met.

Socio-economic and demographic data are important indicators for monitoring the impact of management and development regulations (Christophersen *et al.* 1997). As such, with the drafting and ultimate implementation of the first FMP for the NMP, it is essential that social, economic and demographic information of all stakeholders (specifically fishers engaged in fishing in the inshore areas of the NMP) be incorporated into the planning process since it is these people who will potentially be impacted by the regulations.

The overall findings of socio-economic surveys reveal that communities in Negril accept co-management of the NMP, leaving responsibility to the government and non-governmental organizations. Furthermore, the communities believe they have limited influence in management of the park. Communities must therefore be encouraged to participate in managing the Negril Marine Park. Fishermen need to be made aware of the fact that they have a key role to play in the management of marine resources and are necessary as partners in the management of the NMP. Most of the communities do not participate in management due to the lack of communication and inadequacy in informing the communities on management issues.

In order to increase the level of stakeholder participation in natural resource management within the NMP, park managers must find other effective methods of informing the communities and continually keeping them involved in the park management process. However, in order to be effective, approaches to public education should be carefully chosen or designed to cater to both the literate and illiterate members of these communities, especially since the majority of respondents have only a primary level of formal education. Participation may be encouraged through several methods such as regular community meetings at appropriate venues for the fishing community, community liaisons, developing community outreach programmes to raise the awareness and enhance the public's participation and developing stable organisations

for stakeholders in the harvest sector (e.g. fishers, charter boat fishers) and those within the post harvest sector (e.g. restaurant owners, sea food outlets). Additionally, the development and strengthening of community associations to assist stakeholder groups in participating in management of the area should be addressed as another means of increasing participation.

Co-management of the NMP is essential to successful fisheries management. Communities can work with the government combining scientific and local knowledge while sharing responsibility in decision-making. Co-management can also be helpful in resolving resource user conflicts. Results have shown that in the NMP it is possible that fishers can cooperate with each other and also cooperate with other users in the tourism sector in the management of coastal resources specifically because both depend on these resources for income and employment. However, communities must have a sense of ownership of the park resources, in order for fisheries protection to be successful. From the surveys it is apparent that communities surrounding the NMP do feel a sense of ownership for the resources since many of the respondents thought that resource users were responsible for solving problems in the park. However, they continue to contribute to resource decline.

The surveys showed that local knowledge of the resource condition is consistent with scientific evidence which documents deterioration of coastal and marine resources. The concept of stakeholder ownership of the park's resources should be encouraged and could be a means of contributing to the improved management of fishery resources through adherence to management regulations. However, although communities have recognised that there have been declines in fishery resources, when surveyed they stated that the amount of fishing within the NMP was 'just right' indicating that they believed fishing was not a problem there.

For the communities surveyed, fishing is the primary and secondary occupation with the majority of them dependent on fish as a major source of food. Fishing may therefore be considered to be the mainstay of community livelihoods adjacent to the NMP. Full and part-time fisher families from communities in and around the NMP may be affected by possible restrictions on fishing and fishing effort within the NMP with the implementation of the FMP. It should also be noted that displacement of these fishers (who represent the poorest fishermen in Negril) due to management regulations will have a significant impact on their income generation capabilities.

Therefore, the government should seek to create alternative job opportunities and implement other strategies to protect the livelihoods of the people living in and around the park. Training for alternative livelihood opportunities and re-training in areas that would provide fishermen with the necessary skills to compete for employment in the NMP or park-related activities should be examined and

initiated. Alternative livelihood options are limited and should be related to their present profession to be successful. They must also be economically feasible from the fishermen's perspective. If alternatives are not financially appealing, adoption of the regulations to protect the marine and coastal resources of the park will not be forthcoming unless subsidies and or incentives are offered. Moreover, the older population may be reluctant to change from fishing to an alternative occupation. Most of the respondents are not pursuing any training in alternative occupations therefore the park must aim towards training the minority of younger fishers in new fishing techniques, practices or new occupations. New job opportunities can include tourism and alternative types of fishing and these are consistent with the fishers' culture and knowledge base. New strategies must be developed to deal with the older fishers. Emphasis should be placed on educating them on sustainable fishing practices and introducing the concept of complimentary livelihoods.

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