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The Myth of Sustainable Livelihoods: A Case Study of the Mnazi Bay Marine Park in Tanzania

Geofrey Mwanjela, MEM 2011

Abstract

The extent to which marine parks influence livelihood strategies and attitudes of local communities towards the conservation of marine biodiversity was studied in Mnazi Bay Marine Park in Tanzania. It was found that the park has had significant, adverse effects on people’s livelihood strategies such that people have developed negative attitudes and practices towards the park and fisheries in general. This is evidenced by increased tensions between local people and park authorities and the outright rejection of the park concept in some villages. These negative attitudes pose considerable challenges to the park’s success and the fishery’s sustainability.

Introduction

In response to the mounting pressure on marine resources in Tanzania and elsewhere, marine protected areas have been established worldwide. In contrast with most terrestrial protected areas where people are excluded from living within the park boundaries (Adams et al. 2004, Barret et al. 2001), some marine parks include residents within the boundaries (Walley 2004). In these instances, park management must ensure that local livelihoods are not adversely affected as a result of the marine park’s creation. Without ensuring protection of livelihoods of the local people living within the marine park, it is likely that local communities will reject the park and marine resources will continue to be degraded (Brown et al. 2001, Mwaipopo 2008, Walley 2004).

Although many studies have attempted to address the relationship between livelihoods and terrestrial protected areas (Adams et al. 2004, Pimbert and Pretty 2000, West 2006), few have been carried out for marine protected areas (Mascia et al. 2010). Despite the uncertainty of marine parks’ impacts on local communities, the use of marine protected areas (MPAs) as a primary mechanism to protect marine resources has increased at a rate of 4.6% per year since 1984, totaling 4,435 MPAs in 2006 (Mascia et al. 2010, Silva 2006, Wood et al. 2008).

This paper, based on data collected in the summer of 2010, seeks to address two questions: how has the creation of the Mnazi Bay Marine Park influenced the livelihoods of local communities, and to what extent has its creation changed the perception of the local people toward the marine protected area? Answering these two questions is critical to ensuring community support of the marine park over the long-term.
Mnazi Bay Marine Park in Tanzania

Although fishing is a major activity, until recently it has been primarily based on traditional and small-scale fishing tools. The inefficiency of traditional fishing gear and the need to increase revenue motivated the communities to use dynamite fishing, which also fueled the efforts to create this marine park (Malleret 2004, URT 1998, URT 2005).

Prior to the park’s establishment, the communities were fishing as far away as Kilwa in northern Tanzania and Mozambique to the south. Periodic migration was also practiced whereby men and women fishers, as well as temporary settlers from other areas, camped in small islets inside the current marine park (Malleret 2004, Muhando et al. 1998). Temporary migration is still practiced in the islands, but to a lesser extent than during the period prior to the park’s creation of fishing zones and the enforcement of restrictions, described below.
Several factors contributed to the selection of the Mnazi Bay Marine Park for this study. First, because the marine park is new, there has been little research of its impacts on local communities. Second, there have been conflicts reported in some villages of the park. Third, the inclusion of people in the marine park offers a counterexample to most existing literature on protected areas because of different characteristics between marine and terrestrial protected areas. Fourth, not only is conservation essential to this marine park, as it ranks among the highest in marine biodiversity in East Africa, but additionally, communities found in the park are poor and depend on the marine resources for their livelihoods (Gawler and Muhando 2004, Malleret 2004, Malleret and Simbu 2004).

The management of Mnazi Bay Marine Park

The park’s general management plan requires collaborative management with villagers through a Board of Trustees under the Marine Parks and Reserve Unit (URT 2005). To bridge the gap between the marine park and local communities, the marine park worked with the United Nations Development Programme (UNDP) to create Village Environmental Management Programmes (VEMPs). These VEMPs exist in the first ten villages that joined the marine park, and are composed of committees that manage different roles. These include mangrove forest management and overseeing conservation activities in collaboration with village governments to coordinate patrols.

The creation of this marine park led to the restriction of the traditional fishing methods, closure of some fishing grounds, and controlled harvest of fish and other marine resources (e.g. mangrove) through the creation of four zones in the marine park. The core zone prohibits the extraction of resources. The specified user zone provides certain use rights to park residents but restricts use by non-residents. The general use zone only allows access to non-residents through permits. Additionally, an encircling buffer zone acts to protect the park from activities occurring outside its boundaries (URT 2005).

Sampling and analysis plan

I conducted this study in six villages for a period of six weeks. Five of the six villages are located in the park while the other village is located in the buffer zone. A multi-method approach was used to increase reliability of the primary data. A total of 160 semi-structured interviews were conducted with the heads of households in four villages, with 40 interviews in each village. Four villages were selected based...
on the following criteria: a village which has over time shown negative attitudes towards the park; a village that is far from the park (inland village); a village that is close to the ocean (seafront village); and a village with high dependency on marine resources (fisheries). The other two villages were selected based on two criteria: one village is the site of recently increased conflicts with the park, and the other village is located in the buffer zone but refused to join the marine park. This inclusion of villages with various characteristics during research enabled me to understand the heterogeneity of dependency on fisheries; trends and possible sources of conflicts by village and across the park; perception of the park by villages; and the patterns of livelihood diversification and strategy across the park.

Questionnaires, focus group discussions, archival research, participant observation and interviews with park officials were used as methods of primary data collection. The combination of several methodologies provided detailed information on the interaction between the marine park and communities at both household and village level. Households for interviews were selected by random sampling, and were stratified based on the occupation of the head of household (in fisheries or agriculture) and presence in the village before and after the park establishment. Focus group discussions were conducted in all six villages based on the occupation and position of villagers in the decision making process of the village. Participant observation during interviews and focus group discussions facilitated the understanding of attitudes and perceptions toward the park.

Quantitative primary data were analyzed using binary logistic regression, in which several variables were regressed to understand perceptions towards the park and patterns of livelihood strategy in villages and across the park (Stevens 2002, Peng et al. 2002). The value of regression coefficient ($\beta$) determines the direction between the outcome variable (fisheries and agriculture) and the predictor variable (e.g., gender) (Peng et al., 2002). $\beta$ is significant at 1%, 5% and 10%. $\exp(\beta)$ is the odds ratio.

### Results and Discussion

Agriculture and fisheries were found to be the main essential livelihood strategies for the local communities in the marine park, showing equal importance among all village locations. Among all age groups and genders, both strategies appear to be significantly affected by the marine park’s implementation (Table 1). This influence was detected in all villages. Because this marine park is characterized by sandy soils, which do not support agriculture very well, food security could be a serious concern. As a result, communities depend more on fishing than on farming during times of food scarcity, regardless of the village’s proximity to the seafront.

Most villagers also practice a variety of productive activities. One underlying factor

### Table 1. The relationship between main economic activities (fisheries and agriculture) and other variables.

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Fisheries</th>
<th>Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine park officials performance rate</td>
<td>0.048</td>
<td>0.238</td>
</tr>
<tr>
<td>Village location (seafront versus inland)</td>
<td>0.88</td>
<td>0.043</td>
</tr>
<tr>
<td>Attitude towards fishing</td>
<td>0.831</td>
<td>-0.587</td>
</tr>
<tr>
<td>Age (above 18)</td>
<td>0.024</td>
<td>-0.071</td>
</tr>
<tr>
<td>Gender (male)</td>
<td>0.066</td>
<td>0.931</td>
</tr>
<tr>
<td>Coping mechanism during food scarcity</td>
<td>0.005</td>
<td>0.929</td>
</tr>
<tr>
<td>Education (formal)</td>
<td>0.249</td>
<td>-0.311</td>
</tr>
</tbody>
</table>

Notes: Education, marine park officials performance rate, village location, attitude towards fishing, age, gender, and coping mechanisms were used as control variables (predictors) for both fisheries and agriculture. The value of regression coefficient ($\beta$) determines the direction between the outcome variable (fisheries and agriculture) and the predictor variable (e.g., gender) (Peng et al., 2002). $\beta$ is significant at 1%, 5% and 10%. $\exp(\beta)$ is the odds ratio.
According to villagers, the park officials made several promises during the establishment of the marine park. Villagers were promised that they would receive legal fishing nets, modern fishing boats, and development of alternative income generating activities. The nets were aimed at controlling illegal fishing of undersized fish and destructive fishing practices that were originally seen as evidence for the need to create the marine park (Malleret 2004). The boats were promised to ensure that livelihoods of the local communities living within the park boundaries would not be compromised by the new fishing restrictions. To offer alternative sources of income, the park proposed beekeeping projects and the establishment of home vegetable gardens. These activities were expected to generate tangible benefits so that people could reduce their dependency on fisheries and support the conservation goals of the marine park.

Because fisheries form one of the primary livelihood strategies, the local communities have raised serious concerns about restricted access to fishing. In surveys and focus groups, villagers indicated that the most significant adverse impacts of the park have been the confiscation of fishing nets that do not meet the appropriate mesh criteria and the inability of the traditional fishing boats to reach the allocated areas for fishing.

Although the creation of different zones was essential for biodiversity conservation (URT 2005), losses from the reallocation led to negative social impacts in Mnazi. Many villagers are unable to fish in the new areas that the park has allocated. They claim that new fishing grounds are located in the deeper waters far from shore where their traditional dugout canoes cannot reach.

For this diversity of livelihood strategies is the increased responsibility to earn money that men face when they have many wives. Other studies have also shown that multiple livelihood strategies are typically practiced in poor communities (Banerjee and Duflo 2007). This extends to small businesses and casual labor on others’ farms. This finding also contradicts the assumption that only fishing households were vulnerable to the effects of the park creation (Gawler and Muhando 2004).

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Mnazi Bay Marine Park in Tanzania

changed attitudes towards fishing than women. This could be due to greater participation in fishing by men (Malleret 2004). However, it is difficult to conclude whether this pattern is normal or transitional because of the short period of this study. Ongoing research still occurring in the marine park should clarify this.

Prior to the formation of the marine park it was common for villagers to make decisions individually and independently about the intensity of their fishing activities. The transition towards the marine park has therefore acted as a shock to most villagers. The changes in attitudes are driven by a decline in the marine resources business and the belief that outsiders (marine park officials), who represent the state, control the resources.

Trade in marine resources was carried out extensively in villages such as Msimbati before the park’s creation, with traders coming from as far as Mozambique to trade fish, octopus, and sea cucumbers (Malleret and Simbua 2004). Some villagers indicated that the period of trade before the park was the most significant economic boom of their lifetime (1980s to mid 1990s). Other villagers point to the past boom in market-based fisheries as evidence that the park’s creation has reduced revenues. This is the reason why other villages such as Nalingu remain unwilling to join the marine park because they feel that revenues obtained from the fishery will diminish due to the imposition of fishery

top-down approach by marine park officials during implementation contributed to the failure of local adoption among villagers. During the planning of park activities, there were no comprehensive educational or training programs provided to demonstrate the proposed income-generating activities, and no study was conducted to estimate their feasibility.

Evidence shows, however, that the park administrators were more concerned with conservation of biodiversity and enforcing the new fishing restrictions than they were with supporting the economic well-being of community members. Ten years since its creation, the park has failed to carry out its promises to the community. Rather, the park has focused its efforts on ensuring that the locals conform to the park regulations. The promises and hopes for livelihood improvements remain a myth and have triggered social tensions, created conflicts, and have changed some people’s perceptions about the value of the marine park. For example, marine park officials often travel in groups to avoid confrontations in some villages.

The changes of attitudes and perceptions towards fishing tend to vary significantly with gender and village location (Table 2). People in the seafront villages are more likely to have changed attitudes as they showed more disapproval and frustrations with the park’s creation. Men appear to be more likely to have changed attitudes towards fishing than women.

Table 2. The relationship between attitude towards fishing and other variables.

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>p</th>
<th>Coefficient (β)</th>
<th>Exp (β)</th>
<th>95% C.I. for Exp (β)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Marine park officials performance</td>
<td>1.57</td>
<td>-0.404</td>
<td>0.668</td>
<td>0.382</td>
</tr>
<tr>
<td>Village location (seafront versus</td>
<td>0.002</td>
<td>1.365</td>
<td>3.915</td>
<td>1.618</td>
</tr>
<tr>
<td>Economic activities (Fisheries and</td>
<td>1.47</td>
<td>0.385</td>
<td>1.47</td>
<td>0.818</td>
</tr>
<tr>
<td>Age (above 18)</td>
<td>0.678</td>
<td>-0.388</td>
<td>0.678</td>
<td>0.333</td>
</tr>
<tr>
<td>Gender (male)</td>
<td>0.042</td>
<td>1.538</td>
<td>4.656</td>
<td>1.054</td>
</tr>
<tr>
<td>Education (formal)</td>
<td>0.966</td>
<td>0.011</td>
<td>1.011</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Notes: Age, education, economic activity dependency, marine park officials performance rate, village location and gender were used as controls. C.I. is the confidence interval. β is significant at 1%, 5% and 10%. The description of other variables is the same as in Table 1 above.
recommendations. During the interviews and focus group discussion, many villagers commented that "the ocean has been sold, we don't own anything." These comments indicate the growth of fear of marine parks by the communities and an increasing gap between them and the marine park administration. These outcomes have led to a decline in the sense of ownership of the marine resources by the local communities.

Other factors that drive the changes in perception include the failure of the marine park to deliver promises and the information gap that exists between villagers and the park. Despite the fact that the marine park officials have actively promoted the enforcement of regulations, they remain relatively unknown by most of the community. For example, about 70% of the sampled head of households were not aware of the park regulations and the existence of park boundaries. This does not prove that the information is not available, but it does reveal that park officials are not getting their message out. Though several village committees were created to bridge the gap between the villagers and the marine park and promote conservation, fishers expressed a lack of trust in these committees and claimed that they were not their true representatives in the marine park.

Conclusion
The results reveal that interactions between the park and local communities have worsened perceptions and attitudes largely due to the failure of alternative income-generating activities and the lack of participation by local communities in the marine park management. This has fueled the rejection of the marine park by villagers and increased conflicts in villages such as Nalingu. The increased separation between the park authorities and the villagers present major challenges and prevent the marine park from achieving its goals of sustainable conservation and livelihood improvement.

Recommendations
It is not too late for the Mnazi Bay Marine Park to reverse its rejection by communities and its failure to implement income-generating activities. There is a promising window for building confidence in communities because the villages have similar cultural norms and very close relationships due to intermarriage. Approaches such as the provision of environmental education to villagers and employment of locals in the marine park management will help to build confidence and increase the participation of local communities in conservation. By overcoming the challenges addressed in this paper, the marine park should be able to set a platform for enormous change in the social structure of the marine park and promote a promising future for the local communities.

The claim is not that marine parks are bad options for conserving biodiversity and protecting livelihoods, since they offer many benefits toward achieving these goals (Sanchirico et al. 2002). Instead, this paper demonstrates that the failure to integrate livelihoods and conservation provides significant challenges to the success of any conservation area (Mwaipopo 2008). These results should provide a warning to other marine park planners: bridging the gap between local communities and the marine park administration is a fundamental requirement for sound conservation.

Endnotes
1. The complete name of the park is the Mnazi Bay Ruvuma Estuary Marine Park.
2. Throughout this paper, the term ‘user’ means a villager, resident, or non-resident who can have access to resources in the designated areas of the Marine Park and the term ‘zone’ refers to the area set aside for protection of both marine and coastal environments.
Acknowledgements

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