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What does it take to be heard in managing marine protected areas? Insights from Tanzania coastal communities

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Abstract:
This paper explores the debate on participatory approach by presenting evidence from the local communities practices living within the marine protected area in Tanzania (Mnazi Bay Ruvuma-Estuary Marine Park). Five out of fifteen villages that exist in Mnazi Bay Marine Park were selected for this study after consultation with the park authority. Stratified sampling of villages was conducted based on the location from the Indian Ocean: three villages located close to the sea (sea front villages) and two villages located far from the sea (inland villages). Both quantitative and qualitative data were collected using semi-structured questionnaires, focus group discussions, participant observation and interviews. The findings are presented using the local community narratives on livelihoods strategies and participation in decision-making processes to highlight the challenges of a participatory conservation approach in marine resources management within MPAs and also using regression analysis to explain the factors determining their participation. A Logit regression model is run. Results show that participatory approach in MPAs is a challenging phenomenon due to existence of multifaceted layers in marine resources management and use. These layers exist in terms of power struggle to manage resources and extract benefits associated with marine resources between state and local communities. This power struggle tends to undermine the ability of local communities to use and manage marine resources, threatening the attainment of the main objective of establishing the MPAs that's improving the livelihood of the adjacent communities and improving the resources.

Keywords: participatory approach, local communities, marine protected areas, fisheries management, marine resources governance, livelihood strategies

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1. Introduction

The use of marine protected areas (MPAs) is a common practice in marine biodiversity conservation in most developing countries and many of these MPAs incorporate local communities within their boundaries. These local communities draw on various resources from the marine and coastal ecosystem for their livelihood (Sanchirico *et al*., 2002). The proximity to- and dependency on marine and coastal resources has led to the development of a new management approach in which the local communities are involved in both managing and sharing benefits associated with marine biodiversity (Mwaipopo, 2008; Walley, 2004). Through participatory management, the local communities are granted by the state some powers, responsibility and ability to extract marine resources in a sustainable way.

There is a debate that questions the effectiveness of both the participatory approach and performance of MPAs worldwide. The debate centers on the premise that both the participatory approach and MPAs are not performing well, mostly because the participatory approach in marine resources management has become complicated than previously thought (Mwaipopo, 2008; Walley, 2004; Wilson *et al*., 2009; World Bank, 2005). This is mainly due to many reasons: the integration of conservation and development has become biased towards biodiversity goals (Barret *et al*., 1995; Nelson, 2010; Walley, 2004); and MPAs relationships with the local communities are not well understood (Mascia *et al.*, 2010; Mascia and Claus, 2009). Given that, the use of the participatory approach for MPAs may be particularly challenging since MPAs in most developing countries are a relatively new concept compared to terrestrial protected areas that have a long history, extensive literature and exclude local communities from living within the boundaries (Adams *et al*., 2004; Mascia *et al.*, 2010; Walley, 2004). We explore this issue by looking at the communities leaving with the boundaries of the protected MPAs.

The rest of this paper is organized as follows: first, literature review on the historical development of the participatory approach of marine resources management is presented. Second, the paper discusses the integration of participatory approach in MPAs in Tanzania. Then, the paper explores, in brief, the establishment of Mnazi Bay Marine Park. The last section of this paper provides the contextual methodology used and I discuss the research findings.

1.1 Participatory Approach: Concept and Meaning

The concept behind the participatory approach is that local communities receive some, but not all, powers in managing marine resources. In many cases, the state retains more control over resource management than local communities (URT, 2005; Walley, 2004). The degree to which resource control is distributed among various actors is a determining feature of the relationship between the state and local communities regarding resource management (Shackleton *et al*., 2002; Wilson *et al*., 2009).

The application of participatory conservation approach is a relatively new concept to many MPAs (Mwaipopo, 2008; Walley, 2004). This concept was first adopted in terrestrial protected areas in the early 1980s in many developing countries after the failure of an inherited colonial driven conservation approach (Berkes, 2004; Nelson and Agrawal, 2008; Songorwa, 1999;

Walley, 2004), which was characterized by total exclusion of local communities (Berkes, 2004; Walley, 2004). The high social-economic cost to manage protected areas and decreased biodiversity in the terrestrial parks called for the participatory approach towards conservation (Fabricus, 2004: 10).

1.2 Participatory Approach in Practice: Experience from Marine Protected Areas In Tanzania

Mafia Marine Park: Creation and Participatory Approach

Mafia Marine Park (MIMP) (Figure 1), which was created in 1995, is the first marine park in Tanzania. Government of Tanzania created MIMP with financial support from Norwegian Agency for Development Cooperation (NORAD) and Global Environmental Facility (GEF) (Walley, 2004). Lessons learnt from failure of in-country terrestrial protected areas motivated the approach of involving local communities in MIMP creation (Mwaipopo, 2008; Walley, 2004). However, the creation of MIMP has been described as politically, socially and economically contested by local communities (Walley (2004). It is described in this contestation as being driven by multifaceted aspirations of local communities, international organizations, and the government (through marine parks and reserves unit). While communities were interested in both conservation and achieving their livelihood, government and donor agencies were more interested in seeing MIMP as the country's development strategy through eco-tourism. MIMP was seen as source of revenues from eco-tourism that at the time was a growing phenomenon in most terrestrial protected areas (Nelson and Agrawal, 2008; Walley, 2004). The government viewed the local communities as conservation villains due to the precedent illegal fishing activities in the early 1990s. The narrative on MIMP creation presents how meaning and power over natural resources by various actors situate themselves in a discourse of resource governance and access that in turn undermine local communities.

Mnazi Bay Marine Park: Participatory Approach and its Incorporation during Creation

Mnazi Bay Marine Park, which was created in 2000, is the second largest marine park in Tanzania. Although fishing is a major activity for residents found in this marine park, until the recent past fishing has been primarily based on traditional and small-scale fishing gears (Malleret, 2004; URT, 1998; URT, 2005). The declining stock, inefficiency of the traditional fishing gear and the desire for more revenue, motivated the communities to use dynamite fishing and other illegal gears that partly fueled the creation of this marine park (Malleret, 2004; URT, 1998; URT, 2005). However, the creation of this marine park has partly been described as rushed without proper consent of local communities or mechanisms to reduce adverse impacts on residents' livelihoods (Gawler and Muhando, 2004). Two forces dominated the creation of Mnazi Bay Marine Park: an authoritarian government approach and funding agencies influence. It is important to note that the foreign agencies yielded stronger influence over the park creation than the Tanzanian government (Gawler and Muhando, 2004).

The creation of the park led to the closure of some fishing grounds, and the controlled harvest of marine resources, such as mangrove forests on land. To guarantee controlled harvest of

resources, three zones were created in the marine park: a core zone where no user is allowed to extract resources; specified user zone providing some use rights to park residents but restricting use by people who are not residents; and a general use zone where users from outside the park are allowed to use resources with a park permit (URT, 2005). All consumptive (e.g. fishery, mangrove harvest) and non-consumptive (e.g. snorkeling) uses have been barred in the core zone for both local communities and people from outside the park.

In Tanzania, the Board of Trustees of Marine Parks and Reserves of the Ministry of Livestock Development and Fisheries govern marine protected areas. The Board set up the General Management Plan, which serves as guidance for both conservation and development related activities in the marine parks (URT, 2005).

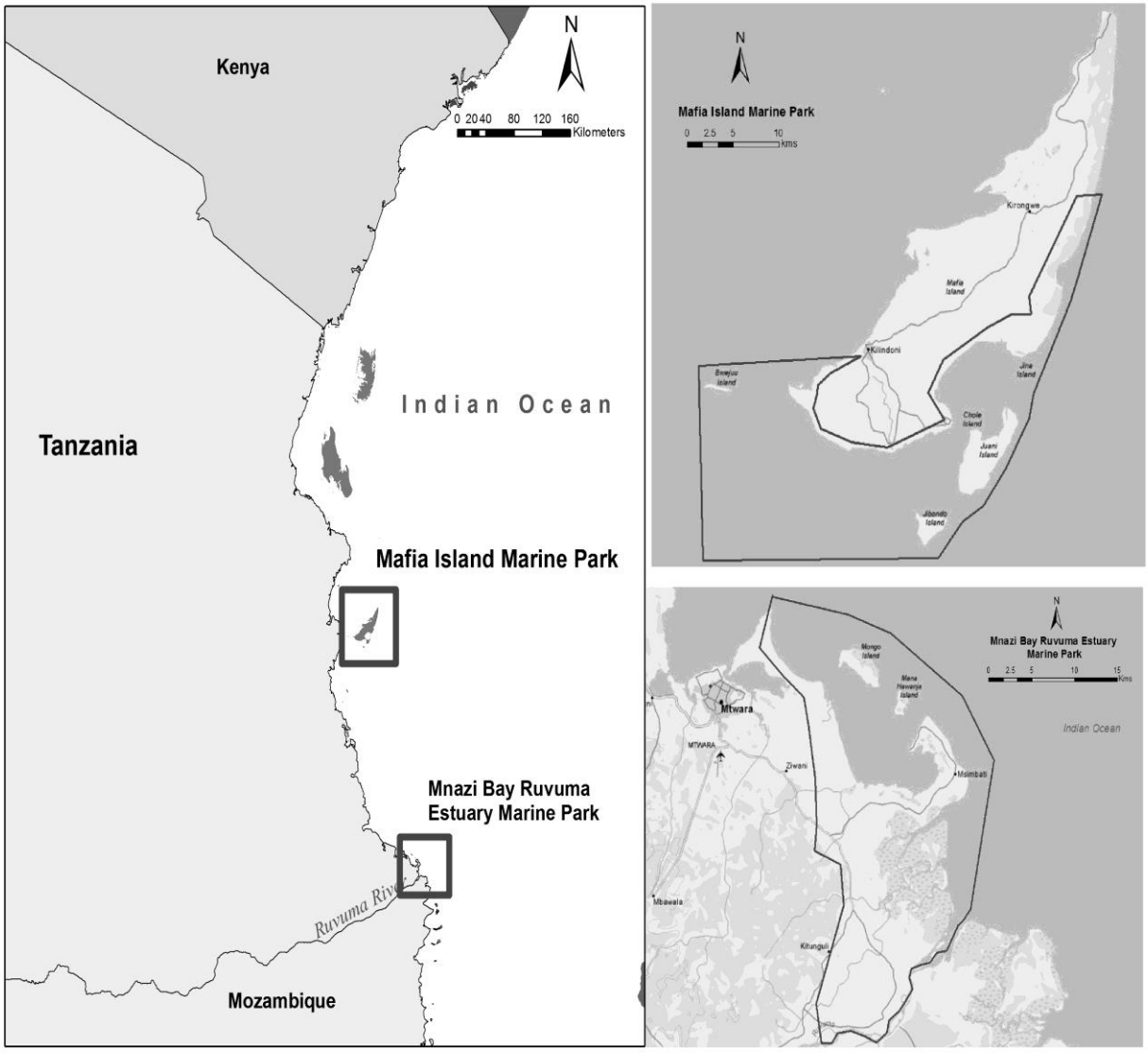

Figure 1: Map showing the location of Mnazi bay Marine and Mafia Island Marine parks.

2. Methodology

Five out of fifteen villages that exist in Mnazi Bay Marine Park were selected for this study after consultation with the park authority. Villages were chosen using criterion sampling (Ritchie *et al.,* 2003) based on the location from the Indian Ocean: three villages located close to the sea (sea front villages) and two villages located far from the sea (inland villages). Both quantitative and qualitative data were collected using semi-structured questionnaires, focus group discussions, archival research, participant observation and interviews. These methodologies were essential to understand marine resources governance; tenure issues on land and marine resources; livelihood strategies and their diversification; and engagement of the local communities by the marine park in managing resources**.** At least 160 semi-structured interviews were conducted in four villages with the head of households. However, the fifth village was excluded from the household questionnaire sample because even before the interviews it showed negative reaction towards the marine park. This was necessary to avoid extreme outliers in the household questionnaires' data analysis. Households for interviews were selected from the random stratified sample based on the occupation of the head of household, mostly fisheries and agriculture; and presence in the village before and after the park creation.

Focus group discussions were held with village community members, village administration and village environmental committees. Meetings with village leaders composed of the village chairman, who is politically elected leader by the villagers; the village executive officer, who is the representative of the local government in the village; and villagers, composed of both farmers and fishers. Documents collected include village government's reports, village environmental management plans, and other socio-economic baseline reports for the marine park. This helped to build narrative within the context of local communities. The collected qualitative information was analyzed qualitatively. The experience working with coastal communities on various socio-economics projects such as costal fishery project in Mafia Island helped to understand the cultural and social-economic characteristics of the communities.

Of additional interest is to identify factors that possibly determine the perceptions of the households on the performance of the MPAs. In this regard, an attempt is made to identify those factors, which are likely to influence the way the respondent judges the success of the MPA. To do this, a Logit model, which is useful in analyzing binary qualitative variables, is used. In this study where we investigate the household perception on the performance of the MPAs, logistic regression model is used due to the categorical nature of the dependent variable, Green (2005) when the decisions are the qualitative choices we equate "no" with 0 and "yes" with 1. In most applications of binary response models, the primary goal is to explain the effects of the independent variable on the response probability $P(y = 1|x)$.

It is noted that P_i ranges from 0 to 1 and is non-linearly related not only to the regressors but also to the parameters thereby causing some estimation problems in as far as ordinary least squares (OLS) estimation technique is concerned. Due to non-linearity which will lead to estimation problem then we reformulate these equations in terms of the probability of the person to perceive on the performance of the MPAs. Estimation of these dummy dependent variables can be done basically in the general framework of the linear probability model (LPM), the logistic regression

model (LOGIT) and the Probit model. The general formulation of the response can be presented as follows:

y= 1 $if\ the\ respondent$ perceive MPAs as a success
0 for the respondent who see differently

In practice the logistic and the normal cumulative distribution functions are chosen, the former giving rise to the Logit and the latter to the Probit.

3. Results and Discussion

3.1 Mnazi Bay Marine Park and the Sustainable Development Question

The objective of the participatory approach is to enhance conservation and development simultaneously. Sustainable harvest of marine resources and several promises were made to local communities by the marine park authority as mechanisms to reduce pressure on fisheries (promoting conservation) and promote development through livelihood diversification strategies (Gawler and Muhando, 2004; Malleret 2004; URT, 2005). The goal was to achieve sustainable harvest of marine resources through the creation of the zones as described earlier. To achieve sustainable development and sustainable harvesting of the fisheries resources marine part authority promised to provide legal fishing nets to the villagers. This was in exchange of abandoning illegal gears, which were rampant in the villagers. Fishermen were to be provided with legal fishing nets (mesh size: 2.5-5 inches), modern fishing boats (through fishing groups), and development of alternative income generating activities such as beekeeping and home gardens. All these strategies by the marine park were geared towards rebuilding the moral obligation of local communities to conserve and reduce dependency on fisheries (Agrawal and Gibson, 1999 cited in Magome and Fabricus, 2004; URT, 2005).

The creation of various zones was essential for marine biodiversity conservation purposes (URT, 2005), but has resulted in the reallocation of traditional access to fishing grounds. The literature is clear on recognizing the negative social impacts related to the reallocation of access to resources (Mascia and Claus, 2009). This proved to be true in Mnazi: villagers are unable to fish in the new fishing grounds that the park has allocated for them this is mainly because the traditional boats (dugout canoes) cannot reach the fishing grounds located in the deep-waters and far from the shore. And the modern fishing boats promised by the marine park authority have never materialized. This posed a serious problem to the park authority and to the villagers, it became the source of extended conflicts between the villagers and the park authority as the villagers continued using illegal gears and encroaching the prohibited fishing ground, which in most cases considered to be important breeding ground.

However, several other things need to be emphasized here on the livelihood strategies of the local communities before proceeding. The two major ethnic groups found in the marine park, the Makonde and Makua, depend on both fisheries and agriculture for their livelihood. However, due to the poor quality of sandy soils, agricultural opportunities are limited. Instead, they diversify into other activities such as small businesses and casual labor on farmland (Banerjee and Duflo, 2007; Malleret, 2004). Fisheries, agriculture and small business are carried out at small scale due to ecological constraints and the lack of financial capital. Fishing offers some business

opportunities for both women and men. While most men engage in fishing, most women sell dried fishes to middle men, who then sell the fishes to nearby towns such as Mtwara town and Lindi. This fish trade existed before the creation of the marine park but mostly for marine products such as octopus and sea cucumbers with buyers coming from as far as Mozambique. The villagers estimate this business to have peaked between the late 1980s and mid 1990s and considered it to have been a time of best economic opportunity. Msimbati village, where most of the traders (from that time) still live, is remarkably different from other villages in the MPA in terms of development and wealth. Most people mentioned that Msimbati which used to be the most important fishing village, was the busiest business centre compared to the current situation where most people can be found idle due to declining fish catch.

The establishment of the MPA not only meant the loss of the sea cucumber and octopus trade. Additionally, women's' livelihood practice (*kutanda*) of collecting marine products such as bivalves is now illegal under the marine park rules. Under the new regulations of the protected area, it is 20% more likely that women are engaging in fisheries related activities (e.g. selling of dried fishes) and 78% more likely engaging in agricultural activities (Table 1) than they were prior to the formation of the MPA. While most women have opted to diversify, men are 80% more likely to engage in fishing due to increased household responsibilities. The likelihood for men to engage in fishing appears to decrease to households that are headed by old men

As indicated earlier, although agriculture is limited in the marine park, local communities do farm in areas outside the marine park along the Ruvuma River banks where water and suitable soils are available. Most villagers from within the marine park especially in villages close to the ocean engage in paddy farming along the Ruvuma River. Drought tolerant crops such as cassava are cultivated in the sandy soils within the marine park as supplement to the rice harvest from agricultural fields outside the villages. Despite the fact that land within the park is under the jurisdiction of the marine park authority, villagers are still accessing land through customary practices. Villagers claim that there are possibilities for them to allow land being used by other people from villages both inside and outside the marine park (within their ethnic groups), which also explains why the park residents are able to farm outside the park.

However, there are more complications in this marine park regarding both conservation and development. The definition of land and resources seems to be perceived differently between the marine park authority and the villagers. While the local communities view land as property with which they can decide to do whatever they want, the marine park authority prohibit any such activity. This was clearly indicated by the complaints by the villagers that the marine park authority would not let them lease land to investors who have shown interest in Msimbati village. Villagers claim that it was possible for them to lease land prior to the park creation. What appears to be missing in this park management is the clarification of issues to park residents on tenure rights of resources in the marine park.

Nearly ten years after the park's creation, livelihood strategies have become a central question to the local communities. It is obvious that the park administrators are more concerned with the conservation of biodiversity and enforcing the new fishing restrictions than with sustaining the livelihood strategies of villagers. The marine park has failed to deliver promises on the

livelihood strategies, which has led to many households to shift to agriculture by more than 50% (Table 1). This shift should not mask the fact that households in the seafront villages depend on fisheries by 60% while households in the inland villages depend on agriculture by 40% and vice versa (Table 1).

Moreover, the livelihood strategies proposed by the marine park are not compatible with the customary activities of the communities. For example, beekeeping is not traditional to these communities and it doesn't generate enough revenue, particularly in comparison to fishing. Figures were not available to quantify such difference, but in the surveys and interviews villagers in Nalingu claimed that beekeeping generates one tenth of the revenues generated by fisheries per year. Also, experience has shown that home gardens initiatives in conservation projects can be negatively affected by gender balance and labor (Schroeder, 1997). In an area like Mnazi Bay where the majority engages in fisheries and agriculture outside the villages, such initiatives are likely to fail because of the presence of sandy soils. These changes and failure of the alternative income generating activities, altogether, pose threats to both conservation and livelihood strategies of local communities living within the marine the park who bear the cost of conservation.

Table 1: Results from logistic regression showing influence of park creation on main livelihood strategies

Dependent variable	Fisheries				Agriculture			
Independent variable:	Coefficient (β)	Wald χ^2	Exp (β)	Probability γ	Coefficient (β)	Wald χ^2	Exp (β)	Probability γ
MPA officials performance (Rated: more worse to excellent)	-0.611* (0.290)	4.441	0.543	0.351	0.343** (0.271)	1.608	1.410	0.585
Change in attitude towards fishing (Yes)	0.245** (0.437)	0.316	1.278	0.561	0.279** (0.433)	0.415	1.312	0.567
Age groups (above 18)	-0.715** (0.364)	3.848	0.489	0.328	0.849* (0.362)	5.519	2.338	0.700
Gender (Male)	1.397** (0.719)	3.370	4.043	0.801	-1.247* (0.613)	4.135	0.287	0.222
Education (Highest level: Primary Education)	-0.238** (0.247)	0.928	0.788	0.441	-0.153** (0.246)	0.390	0.858	0.462
Coping mechanism[30]	-0.965* (0.432)	4.981	0.381	0.276	-0.962** (0.551)	3.045	0.382	0.276
Village location (Seafront versus Inland)	-0.368** (0.427)	0.744	0.692	0.409	0.405** (0.420)	3.045	1.499	0.599

Notes: Each column represents effects of various variables on livelihood strategies for the households. Standard errors (SE) for regression coefficients (β) are expressed in parentheses. * Significant at 5%; ** significant at 10%. Exp (β) is the odds ratio and γ is the probability.

3.2 Mnazi Bay Marine Park and the Local Community Participation Question

After the park creation, Village Environmental Management Plans (VEMPs) were created in 2005 for the first ten villages to be included in the marine park. These VEMPs had sole duty of providing vision for the villages' environmental issues and guidelines for participatory resource management. As per VEMP guidelines, each village within the park is supposed to have environmental committee. According to the village administration and the marine park authority, members of the committees are democratically a representation of villagers (i.e. fishers). The scheme behind creation of committees was to foster empowerment, downward accountability

[30] Working on someone else's farm is used as coping mechanism for household that engages in fisheries as primary livelihood strategy. Option to engage in fishing is used for households that engage in agriculture as primary livelihood strategy

and participation of local communities towards conservation of marine biodiversity. Conservation was considered a key aim of the park given increased illegal fishing particularly due to the use of dynamite fishing (Malleret, 2004; Malleret *et al*., 2004; Muhando *et al.,* 1998).

However, participatory approach in this marine park seems to situate itself only in a rhetoric way (Shakcleton *et al*., 2002; Nelson, 2010). Participatory approach in the form of village environmental committees has turned to be a contestation of power both within the local communities and between the marine park and the local communities. At the village level, the village government appears to have more power than the village environmental committee that has duty to oversee environmental issues. Scholarly findings have indicated that contestation of power of the same level legitimate organizations may sometimes end up in failure of participatory natural resource management (Hara, 2004; Ribot *et al*., 2008). In this marine park village environmental committees are criticized by villagers as not being a true representative of the main issues facing fishers, both at the village level and on workshops organized by the marine park aimed at educating fishers. The presence of these committees may be described as representation of power by central government and loophole for a few village elites to capture benefits through meetings allowances (Bene *et al*., 2009; Wilson *et al*., 2009).

As a result of contestation of power and failure of participatory approach, local communities are merely treated as recipients of the marine park rules (Leach *et al*., 1999) and an impediment to conservation leading to what we describe in this paper as "*bulldozer style state-led conservation.*" This bulldozer approach is not a new phenomenon in this MPA, evidence of complaining from the villagers have also being reported elsewhere (Gawler and Muhando, 2004). One classic statement to support this evidence can be borrowed from Gawler and Muhando (2004: 14), where a villager asserted that: "*whatever comes from the park is like an order…what comes from us* (local community) *is like begging* (alternatives to livelihood strategies)." What we see here is the existence of two layers in the management of this MPA: the hegemonic marine park authority and the subversive local communities that do not have any powers to resist any proposed intervention. The fact that the park is rhetorically governed by the board of trustees (through the Marine Parks and Reserves Unit) perpetuates the top-down approach, creates many layers of the decision-making process, which altogether renders the local communities not as co-managers but rather as subjects (Shackleton *et al*., 2002).

In this marine park most villages have repeatedly indicated the presence of negative stories of their experience with the marine park officials. The stories of negative encounters, which most often ended up in confiscation of fishing gear, were very common during interviews. Stories of the presence of central governance and alienation of local communities will not end there because the local communities do not only fight for their rights to manage resources, but also access to resources that is central to their daily livelihood. Alienation of local communities is not the reason for misguided conservation projects, but perhaps is failure to provide benefits that has resulted in alienation of people.

Even patrolling the protected areas that is supposed to be conducted in collaboration is also carried out in a contested way. Communities carry out patrol in village areas while the park authority patrols in the restricted fishing grounds. According to respondents, there have been

several clashes between the officials and the fishers in the fishing grounds in which the marine park sometimes employ the use of police force during the patrols.

The question of whether the MPA is performing well or not appears to have multifaceted responses. Local communities tend to evaluate both success and failure of the MPA by disentangling themselves from the marine park authority. In other words, they don't refer to the participatory management scheme. Statement such as "*The marine park won't fail because it's a government*" was very common during the interviews and focus group discussions. Yet others feel that the MPA is a failure in terms of its failure to deliver the promised tangible benefits; other villagers see the MPA as success in terms of conservation through returning of some marine species that were rarely seen before the marine park creation; and others see it as success in terms of ability of the marine park authority pushing the local communities to conform to the imposed rules towards marine resources conservation. The later is the result of negative interactions between the marine park authority and the local communities.

4. Conclusion

This paper has attempted to provide an insight of challenges that exist regarding participatory approach in MPAs from the context of developing countries. The evidence from Mnazi bay Marine Park indicates that participatory approach in MPAs is a challenging phenomenon due to existence of multifaceted layers in marine resources management and use. These layers exist in terms of power struggle to manage resources and extract benefits associated with marine resources between state and local communities. This power struggle tends to undermine the ability of local communities to use and manage marine resources, which indicates the failure of participatory resource management in MPAs.

It is important to note here that this paper does not attempt to generalize the challenges of participatory approach in all MPAs, but rather to show how relations among different actors contribute to challenges of marine resources governance. The implementation of any MPA should examine the attributes of each actor very carefully for successful conservation strategies.

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