INCENTIVES FOR WETLANDS CONSERVATION IN THE MUFINDI WETLANDS OF THE GREAT RUAHA RIVER TANZANIA

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ABSTRACT

Sustainable wetland management has to some extent become a high priority for world's environmentalists. Achieving sustainable wetland management may require an increase in the voluntary adoption of best management practices by both local communities and the government. This may be preceded by more tailored suite of incentive measures which are effective in encouraging local people to adopt proper management practices. This study presents results from a study done in the Little Ruaha catchment of the Great Ruaha River Basin. Household surveys were done to assess the relevant incentives for wetlands management and how local communities perceived the incentive and incentive mechanisms for sustainable wetland management. It was revealed that not every member of the community was motivated to conserve wetland and thus the perceived wetland conservation incentives also vary greatly. Among preferred incentives were; joint management, privatization, alternative income generating activities and land use rights/legal land ownership.
Government policies and regulations were not perceived as real incentives. This study recommends a 'tool-box' of incentives which will encourage a range of local people in different situations to conserve wetlands. However, the tool box of incentives and their programs should be implemented with extra cautions as it may result into perverse incentives and consequently lead into unequal benefit sharing becoming disincentives to conservation and further degradation of wetlands.

Key Words: Incentives; Disincentives; Wetlands; Great Ruaha River

INTRODUCTION

Voluntary adoption of the best management practices by all conservation stakeholders is required for sustainable wetland management (Wilson *et al.* 2007). This may be preceded by more tailored suite of incentive measures which are effective in encouraging primary stakeholders to adopt proper management practices. As a result there has been fast growing interest in many parts of the world on the use of economic and social incentives for natural resource management (Cavaye, 2003; Comerford and Binney, 2005). The underlying rationale behind using incentives in natural resources management is that, sometimes the private benefits from an action are less than the public benefits from natural resources. It is also believed that the incentives can merge people's needs with conservation objectives and produce a positive change in people's life while guaranteeing the integrity of natural resources (IUCN 1996). However, correct choice of realistic incentives, need clear understanding of problems facing natural resources management and possible solution before choosing and implementing an incentive program (Comerford and Binney 2005). This can be facilitated by government institutions, non governmental organizations and civil societies as these bodies have important roles to play in the design, support and delivery of such incentive and incentive mechanisms.

The Mufindi wetland systems have been identified as among the risk catchments along the Ruaha catchment due to general non point pollution originating from various anthropogenic activities (Mwaruvanda 2009). Also, uncontrolled practices such as vegetation clearing and cultivation in wetlands have been

going on at the expenses of wetlands and their resident biodiversity. Consequently, Mufindi wetland system and its inhabitants are at risk of dwindling. This situation calls for conservation stakeholders to invest in sustainable wetland management. In order to promote sustainable wetland management, stakeholders should specifically seek, examine and propose practical and realistic preferred incentives and incentive mechanism which will offset on-going uncontrolled anthropogenic activities.

The Mufindi District Council in collaboration with the Rufiji Water Basin has been concerned with deteriorating condition of the Mufindi wetlands. Mufindi is one of the districts in Tanzania where to some extent incentives in conservation of wetlands have been implemented. The two institutions have been implementing different incentives and incentive mechanisms to safeguard wetland resources. Contrary to the effort being made to date, real success is yet to be achieved. The probable reason is that some of the incentive measures in place are not evenly felt across the members' of communities utilizing wetlands and that are not rooted from local people's interest. It has been argued that increased reliance on market based incentives rather than government planning is the way to enhance the quality of life (Munishi 2002, Holcombe 1995; Netting et al. 1989; Geilfus 1997). In this concept markets are conceived as better at producing goods and services, but government planning is better at enhancing the quality of life. Among the essential indicators of the quality of life are the goods and services that an individual is able to consume and enjoy. However, the activities of one individual affect the quality of life of other individuals so that a form of cooperation is necessary to enhance the quality of life. Holcombe (1995) argues that markets are fundamentally better able to enhance the quality of life by producing and conserving those things that are socially valuable. With private or semi private property and market allocation of resources, owners have an incentive to preserve the value of what they own (Holcombe 1995).For this reason, understanding of feasible and acceptable incentives and incentive mechanisms is vital. The present study was conducted to identify incentives and incentive mechanisms that will promote sustainable wetlands management in Mufindi district.

OBJECTIVES

The main objective of this study was to assess incentive and incentive mechanisms for wetlands conservation in Mufindi Wetlands. The specific objectives were to:

i. Assess local community perception on the incentives and disincentives for sustainable wetland management

ii. Assess willingness to pay in Wetland Services as an incentive to conservation

iii. Assess privatization as an incentive to conservation

iv. Assess land ownership in wetland ecosystems as an incentive to conservation

v. Assess joint management options in wetland as an incentive to conservation

vi. Assess the role of alternative income generating activities (AIGAs) as an incentive to conservation and

vii. Assess government policies and regulations for conservation of Mufindi wetlands

METHODOLOGY

Study site

Mufindi district is located at S $08^0$29' 21" and E $35^0$07'18" within Rufiji Basin and is positioned between the Usangu catchment and Ruaha National park. The district is endowed with many small wetlands which form a little Ruaha River (Figure 1). Some parts of Mufindi wetlands are surrounded by dense forest plantations, mainly eucalyptus and pines while few others are surrounded by Miombo woodlands. Agriculture is the main source of income; however productivity varies depending on the availability of moist land. Farms in wetlands are also relatively small mainly for subsistence farming. Most of the crops grown on wetlands include tomatoes, onions, vegetable and Irish potatoes. On the other hand, areas around the houses are dry and therefore, are used for rain-fed agriculture

but productivity is low as farming is dependent on the vagaries of the weather. Most crops from wetlands are sold for cash while rain-fed crops are used as staples for the local's diet.

Data Collection and Analysis

Purposive sampling was employed for village selection. Criteria included closeness to the wetland, extent of wetland utilization and dependence on wetland products. Assumption of this study was that stakeholders were going to provide the most and required information, though triangulation mechanism was also employed in order to reveal some information on incentives and incentive mechanisms.

Three villages namely Bumilayinga, Mgodi and Upendo were surveyed and questionnaire administered to randomly selected households in each village. Individual household respondents were selected at random from village register using random numbers. We interviewed a total of ninety (90) respondents; 30 from each village. This study took the advantage of questionnaire surveys and structured questionnaires were administered to available respondents who were above 18 years. In order to elicit information, open and close-ended questions were used to collect information from the respondents. Data from the survey were coded and analyzed by Statistical Package for Social Science Software (SPSS. version. 12).

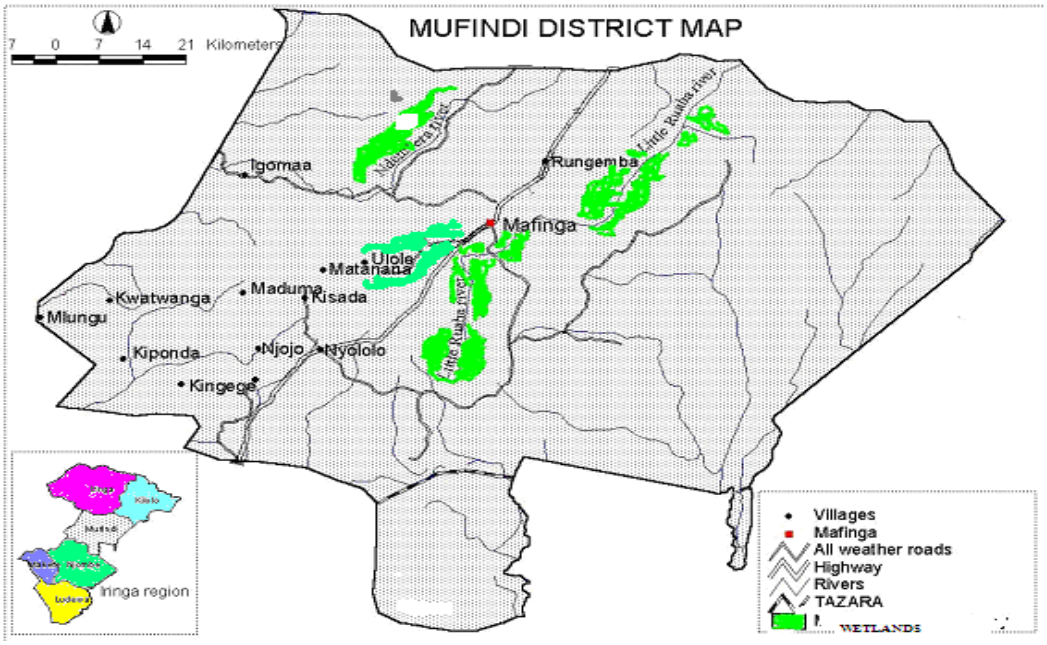

Figure 1: Mufindi Wetlands in the Little Ruaha Catchment Mufindi District

RESULTS AND DISCUSSION

General Information

General characteristics of the respondents include origins, sex, age, level of education and occupation. Results show that about 54.4% of the respondents (Table 1) were natives of Mufindi district and the rest were immigrants, the majority of whom were involved in agriculture and small businesses. This is because Mufindi district is endowed with favourable climate and natural resources suitable for various economic activities.

Table 3: Origins and Household Socio-economic Characteristics in communities adjacent to Mufindi Wetlands

Characteristic	*Villages(N = 90)*			*Overall %*
	Bumilayinga	**Mgodi**	**Upendo**	
Origin (%)				
Native	31	17.8	5.6	54.4
Immigrant	2.2	15.6	27.8	45.6
Education Level				
No formal education				5.6
Primary education				85.5
Secondary education				8.9
College/University				0.0
Gender				
Male				53.3
Female				46.7
Age				
18 – 40				72.2
41 – 60				22.2
> 60				5.6

It was revealed that Upendo village had the highest proportion of immigrants (27.8%) followed by Mgodi village (14%) and lastly Bumilayinga (2.2%). This is due to the fact that Upendo and Mgodi villages are adjacent to Mafinga town and are already sub-urban.

Education is an instrument which occasionally acts as incentives for people to change their behaviour. It is as well excellent complementary strategies to other incentive mechanisms (Comerford and Binney 2005).

The majority (85.5%) of the respondents had acquired primary education, 8.9% had secondary education, and the rest (5.6%) had no formal education. Since, majority had primary education it can be said that, incentives and incentive mechanisms for sustainable wetland management practices are likely to be attained because it will be easier to impart the knowledge on sustainable wetland management. However, the challenge is whether private benefits accrued from wetlands utilization will justify the costs of maintaining it.

About 53.3% of the respondents were males and 46.7% were females (Table 3). This is because in most cases, males were more available and ready to talk. A larger proportion (72.2%), of the respondents was in the age group of 18 - 40 years old, 22.2% were in the category of 41 - 60 years old whereas 5.6% were above 60 years old. This implies that the majority of the respondents were in age groups with enough knowledge of the area and hence wetlands incentives. Most of them have been in the area for more than 20 years, a period which enabled them to experience and/or witness incentives for various conservation and wetland practices in the area.

Incentives and Disincentive to Wetlands Conservation

It was locally acknowledged that Mufindi wetlands render diverse benefits to the local community, though a good proportion of the population (23.3%) had not participated in any wetland conservation activity due to inadequate motivation and incentives. This is probably because what is perceived to be motivation to one individual may not necessarily be a motivation to another individual and is true given the fact that 76.7% of the respondents who participated in wetland conservation activities had different motivations as shown in Table 4.

Table 4: Perceived Motivation for conservation of Mufindi Wetlands by the local communities

Motivation to individual respondent	(%)
Drying wetlands and water sources	39.1
Livelihood support + agriculture	31.9
Conservation education	30.4
Recreation	1.4

Note: multiple responses allowed

Despite some respondents' failure to participate in wetland conservation, this study also found that vanishing of these wetlands could lead to a number of costs to the local community and beyond (Table 5). Some of these costs were famine (65.5%), loss of income (30%) and risk of diseases outbreak (2.2%). This implies that presence of wetland is beneficial to every member of the community and even beyond and thus necessary efforts to conserve wetland resources are vital. These necessary efforts will need to consider the "tool box" of incentives and incentive mechanisms which will take every villager on board as an important step to consider for sustainability of the benefits from wetlands.

Table 5: Perceived cost of loosing wetlands by wetland adjacent communities in the Mufindi Wetlands Tanzania

Village	Costly	No Cost
Bumilayinga	10	0
Mgodi	29	1
Upendo	29	1
Percentage (%)	68	2
Main consequences		**%**
Drought/Lack of water for domestic uses and agriculture		95.6
Shortage of pasture		3.3
Loss o f biodiversity		1.1

Majority of the respondents (78%) were also aware of the activities threatening wetlands and among the threats mentioned by the local communities included agriculture, deforestation and water pollution. Regardless of the awareness on the threats, activities that are polluting and destructing wetlands (Plate 1(a) & (b) were witnessed during field data collection pausing the question as to why they are acting contrary to what they know is detrimental to the health of wetland ecosystems.

Plate 1: Wetland related activities among others which are a threat to the wetlands of the Great Ruaha River cultivation in valley bottoms (b) vehicle washing and other related activities

Some of the respondents felt that polluters need to be punished in order for others to learn. On the other hand, about 2.2% of the respondents were not aware of any effects which may be brought by disappearance of wetlands. This is probably because of different exposure and educational level among respondents.

Willingness to Pay for Wetland Services as an incentive to conservation

When asked whether paying for goods and services from the wetlands would be an incentive for them to conserve wetland resources, 65.6% agreed while only 34.4% disagreed. Majority of the respondents believed that paying less than TZS 100 000 per year is fair though it greatly depends on individual income. Respondents were also asked whether privatization would be an incentive to wetland conservation and 55.6% were positive about privatization though there were varied responses as to whom the wetlands should be privatized (Figure 2). Munishi *et al*. (2002) and Holcombe (1995) argue that with private or semi private property and market allocation of resources, owners have an incentive to preserve the value of what they own.

Respondents who agreed with privatization, argued that common property is no body's property, and that it is difficult to impose and implement rules and regulations under no one's property. They were convinced that putting wetlands under private ownership will tip conservation scale since rules and regulations will be observed. On the other side, some respondents who were against privatization felt that only a few people will benefit if wetlands will be under private ownership. However, others were concerned with conflicts which are likely to occur between private sectors and community, if wetlands will be under private ownership.

Land ownership in wetland ecosystems as incentive for wetland conservation

Best strategy for managing land and natural resources lies in promotion of appropriate property rights regime (Keijiro and Frank 2001). This is because legal ownership increases value of land as owners feel responsible to conservation of the land they own. It is also important to note that long-term viability of natural resources including wetland ecosystems can only be achieved through their effective management and areas adjacent to these ecosystems irrespective of the ownership.

This study found that majority of the communities (71.1%) in Mufindi own parcels of land in wetland ecosystems which has been acquired through inheritance (42.2%) and purchase (15.5%). Though the two categories above may have legal ownership rights through customary laws or other law. Based on the way the land was acquired, a good proportion (13.1%) has acquired the land through hiring thus having no legal ownership.

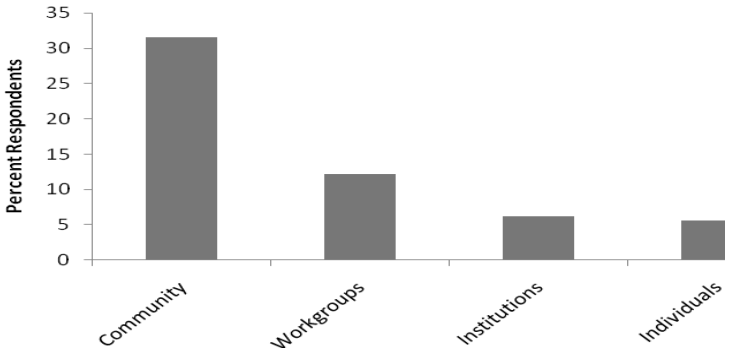

Figure 2: Community responses as to whom wetlands management would be handed over if privatization was an incentive to wetlands conservation in the Mufindi wetlands Tanzania

Only 4.4% of all respondents who owned land had user rights obtained from village government and traditional land ownership (2.2%). This pauses a conservation challenge because of lack of the sense of ownership among this category of users a situation that may exacerbate mis-use of wetlands and their resources due to absence of property rights.

Apart from land ownership, joint management of wetlands was also mentioned (87.8%) as an incentive for conservation. Respondents mentioned that under joint management, community can protect wetlands while government can enforce laws and regulations. This is because government has more power when it comes to decision making and implementation of agreed decision. Alternative income generating activities (AIGA) was also mentioned as a potential incentive for conservation (53.3%). Pooled %ages of the three incentives is represented in figure 3 below, where joint management is most preferred incentive mechanism, followed by privatization and AIGAs.

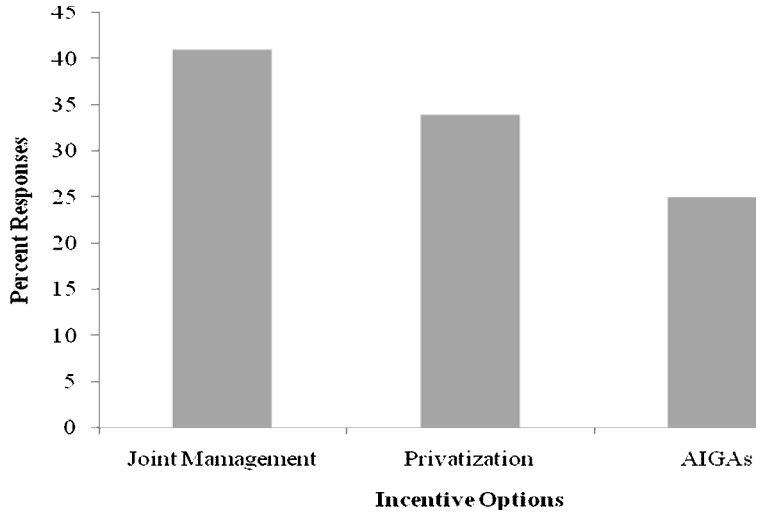

Figure 3: Pooled percentages of the preferred incentives for wetland conservation among wetland adjacent communities in the Mufindi wetlands

AIGAs being least preferred was not surprising as respondents complained on the current system where only a few individuals have access to the AIGA programmes. Chêne and Zinnbauer (2010) pointed out that money related incentive mechanisms can fuel rent seeking activities, where by only elite capture of incentive program benefits. There is also a possibility of such programs to create a pattern of perverse incentives leading to inequitable distribution of benefits, potentially resulting in actual resource degradation. This is because there is likelihood of inadequate representation of interests of non elite group. For the AIGA to tip the conservation balance there must be a mechanism to make sure that all members of the community are involved and benefit equally.

Conservation policies and regulations as incentives for wetland conservation

Majority (70%) of the community are aware of conservation policies while a good proportion (30%) was not aware of any. Majority (50%) of the community were more aware of the national Forest Policy followed by water (6.7%), and agriculture policy (3.3%). Only 10% mentioned penalties as one of the policies (Fig. 4). This implies that large part of the local community knows very little about conservation policies and thus necessary steps to educate the community might be necessary.

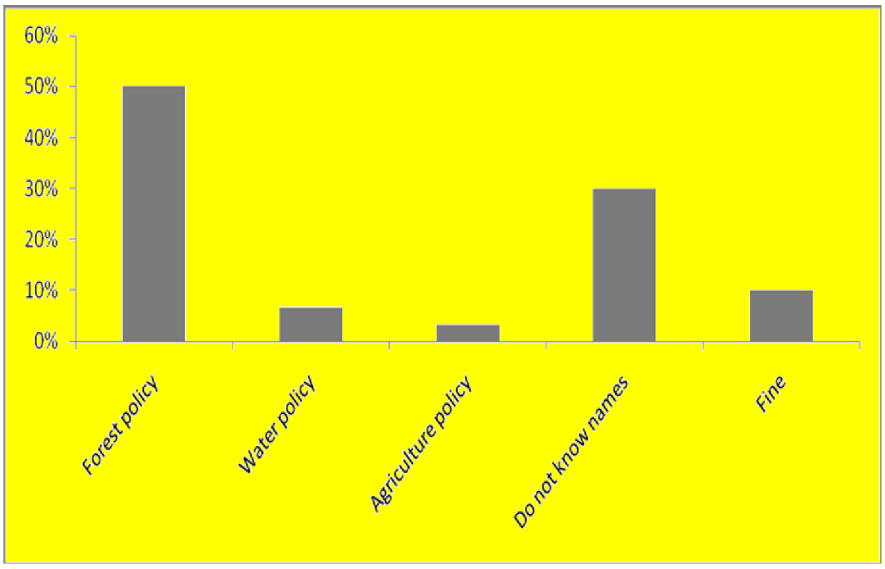

Figure 4: **Respondents' awareness on conservation policies in communities adjacent to Mufindi wetlands Tanzania**

Respondents mentioned that these policies are in the form of regulations that are difficult to get away from and thus act as motives willingly or unwillingly to conserve (55.6%). This was revealed when respondents were asked to state as to why they thought policies to be motivations for conservation. Over 55% of respondents stated that, policies are protecting catchment areas against illegal tree felling, fire and unsustainable cultivation. However a small proportion of respondents who said that the policies mentioned did not motivated them to conserve, argued that, the available policies concentrate much on water resource and not other wetland resources. They especial pointed out that, no single policy advocated sustainable utilization instead restrictions against utilization without adequate reasons. According Gunningham and Young (1997); Lockie and Rockloff (2004); Wilson *et al.,* (2007) policies and programs need to encourage realistic incentives in order to achieve significant improvements in wetlands management.

CONCLUSIONS AND RECOMMENDATIONS

Economic and non-economic measures to promote management change can be used as an incentive to encourage desired natural resource management. Mufindi district is also practicing some of these measures at different degree. These measures were meant to motivate communities to conserve wetlands; however they are not evenly felt across the entire community. For this reason it is important to have a 'tool-box' of incentives that will encourage the range of local people and their different situations to conserve wetlands. Government institutions and non governmental organizations have key roles to play in the design, support and delivery of such incentives and incentive mechanisms.

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