

SOUVENIR

INTERNATIONAL CONFERENCE

On

Global Issues in Multidisciplinary Academic Research

Date: 31st October 2021

Organised By



Indian Academicians and Researchers Association (IARA)

In Association With



Rajabhat Maha Sarakham University, Thailand

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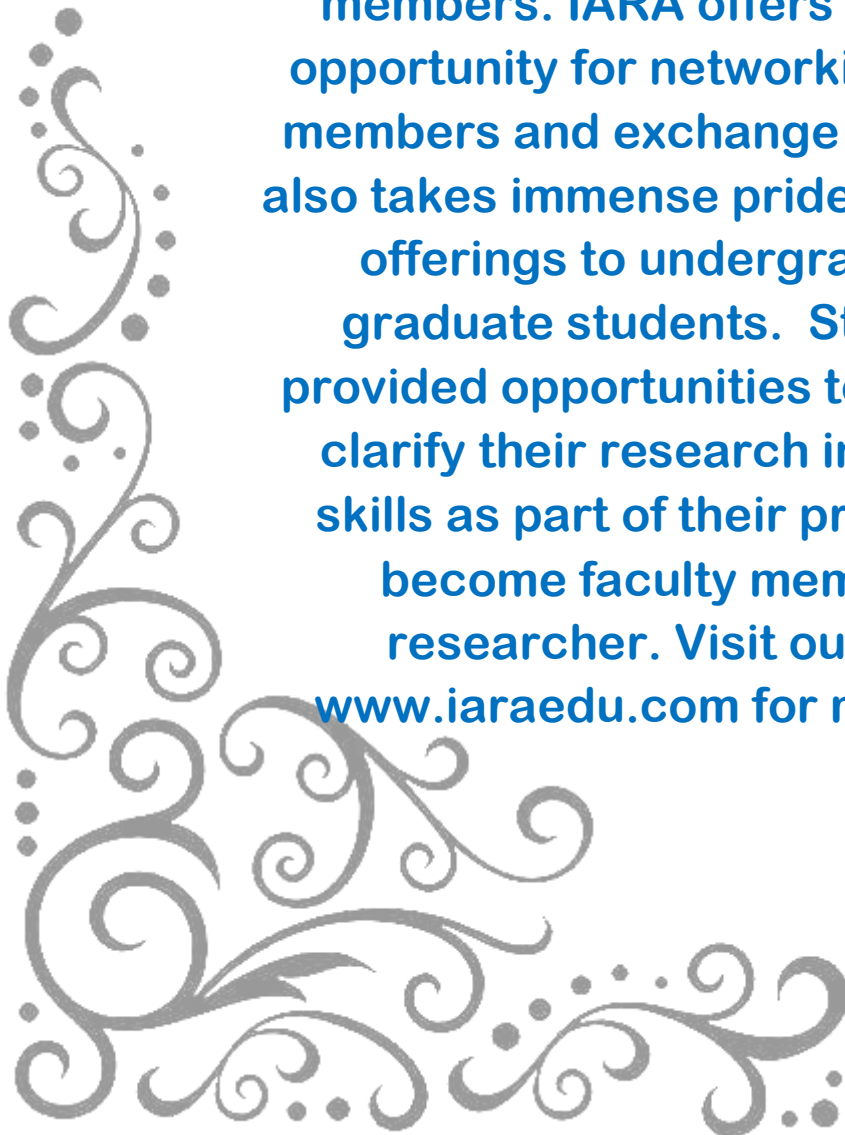
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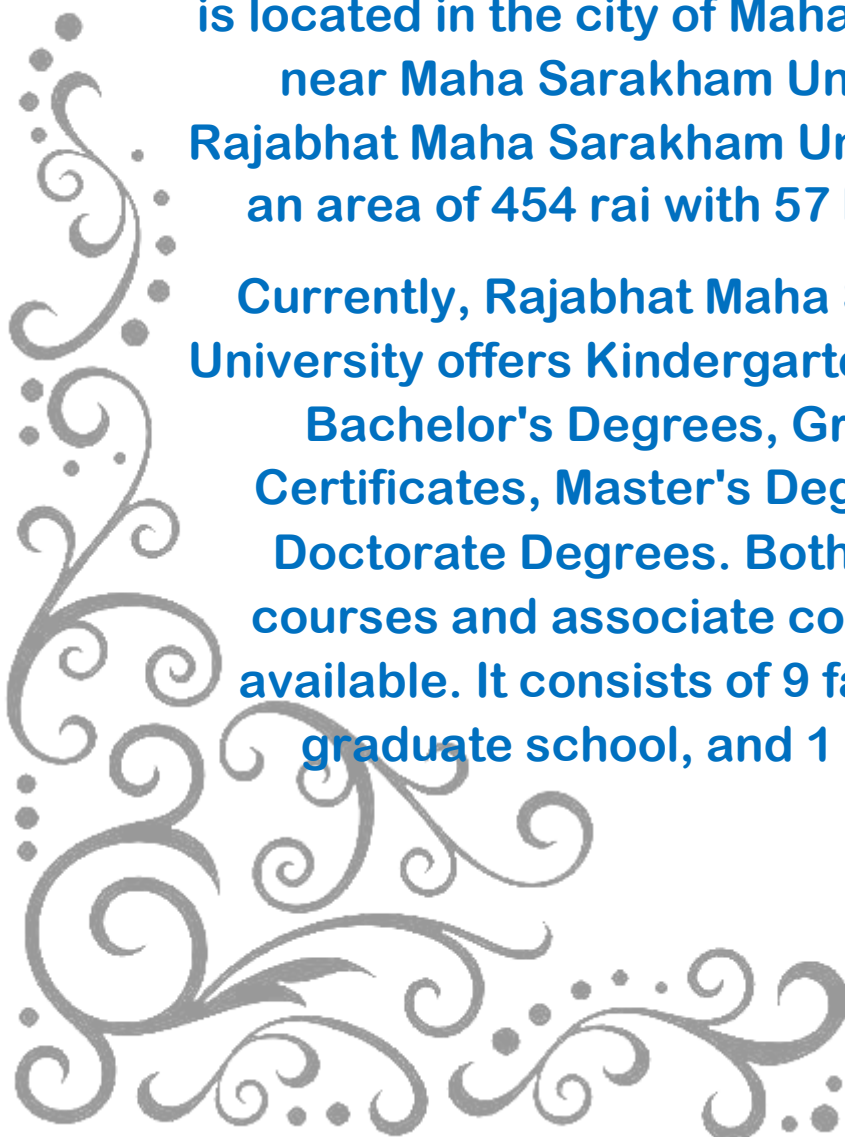


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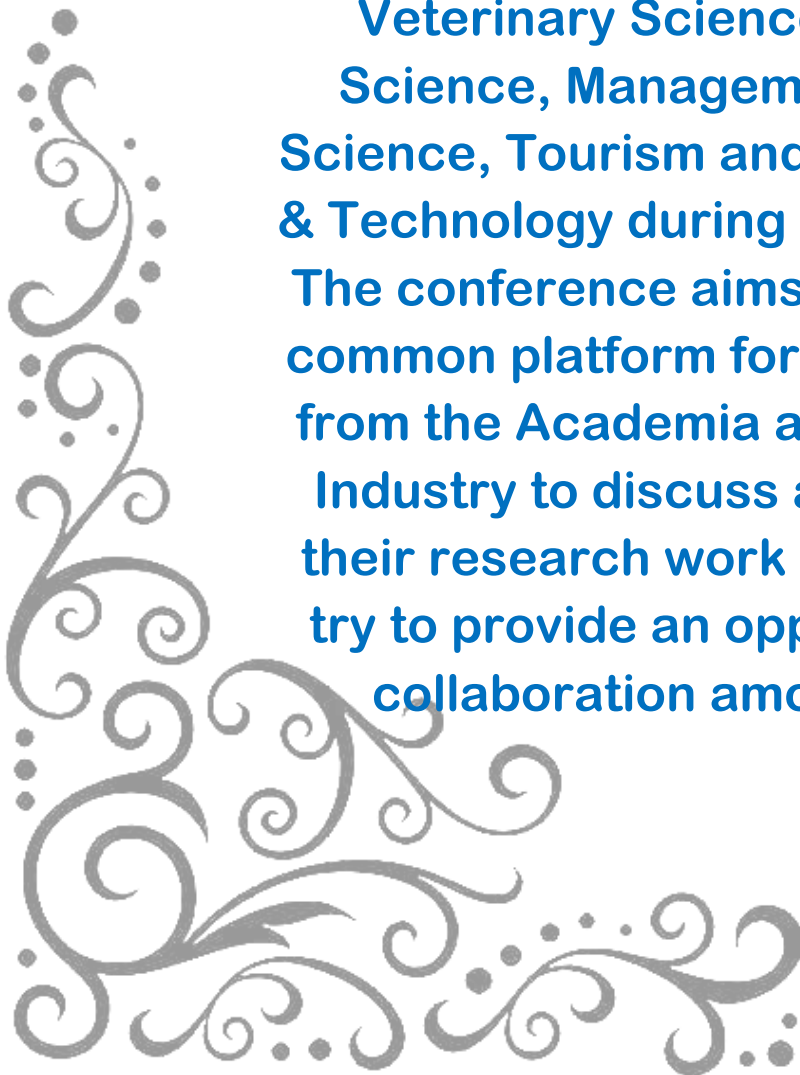
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The conference aims to provide a forum for the exchange of ideas on the researches and developments made in Agricultural Science, Food Science, Environmental Sciences, Pharmaceutical Sciences, Medical Sciences, Veterinary Science, Applied Science, Management, Social Science, Tourism and Engineering & Technology during recent times. The conference aims to provide a common platform for researchers from the Academia as well as the Industry to discuss and present their research work and also will try to provide an opportunity for collaboration among them.



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ABSTRACT

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COSTS AND BENEFITS OF ESTABLISHMENT OF NGARAMBE-TAPIKA WILDLIFE MANAGEMENT AREA TO LIVELIHOODS OF ADJACENT COMMUNITY

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ABSTRACT

Establishment of wildlife management areas (WMA) may have costs and benefits depending on the underlying arrangements. This study was carried out to assess costs and benefits of establishment of Ngarambe-Tapika WMA, in Rufiji District, Tanzania. The data were obtained through interviews with key informants, questionnaire survey and focus group discussions and analyzed by content analysis and benefit-cost evaluation. The study revealed that cultivation and firewood collection were the major livelihood activities carried out before establishment of Ngarambe-Tapika WMA and which were not allowed after the establishment. The benefit-cost ratio is less than 1, implying that that the benefits they were receiving is low as compared to the costs they were generated before establish of WMA. Most respondents depends on agriculture activities as a major economic activity and source of income but this activities had been interfered with wild animals that raid their crops hence increases cost of living of adjacent community. The incidences of crop damage increase yearly due to increasing number of wildlife as a result of better conservation afforded by WMA establishment. It is recommended to address problem of resource access within the WMA. The village governments should set aside special days to allow local communities to harvest dead trees and/or medicinal plants under the supervision of village government. A long-term solution is to advocate the establishment of community forests in each village or households to have forest lots around their farms which could save the multi-purpose role of provision of firewood/timber and also act as farm boundaries. The responsible authorities should find a way of compensating those who are affected by wildlife especially when come into issue of crop damage. To minuses some costs of living and increase benefits it is recommended to improved relationship among investors, local communities and WMA staff, the need to involve local communities in major decisions affecting their livelihood, improvement of business contracts, need for investors to follow village rules and regulation, awareness education and empowerment of local communities should be adhered. Furthermore, the study recommends that efforts should be made to ensure that income generating from Ngarambe-Tapika WMA trickle down to household and/or individual level because most who are affected is individuals. And this can be achieved through increased employment of local community and better pay for the employment in activities related to WMA.

Keywords: agriculture, employment, fair compensation, firewood collection, revenue sharing

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COSTS AND BENEFITS OF ESTABLISHMENT OF NGARAMBE-TAPIKA WILDLIFE MANAGEMENT AREA TO LIVELIHOODS OF ADJACENT COMMUNITY**Rose Gerald Mdendemi¹ and Emmanuel F. Nzunda^{2*}**¹National Land Use Planning Commission, Ardhi House, 1147 Kivukoni Front, 1 Ardhi Street, 6th and 7th Floor, Dar es Salaam, Tanzania²Department of Forest Resources Assessment and Management, College of Forestry, Wildlife and Tourism, Sokoine University of Agriculture, Morogoro, Tanzania**ABSTRACT**

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1. INTRODUCTION

In the 1990s, the governments and influential donor organizations came to realize that the

Long-term integrity of protected areas in low-income nations depended critically upon the support of rural communities that lived adjacent to them. Despite the recognized need for understanding the costs and benefit of conservation borne by rural communities adjacent to protected areas is crucial (Ferraro, 2006). Many academics and practitioners have therefore argued that detailed ex ante assessments of the local impacts of protected area establishment are a critical missing component in the debate over international conservation policies (Indrani, 2005; IUCN, 2008). Without such assessments, it is impossible to discuss the costs and benefits of ecosystem protection in a global context. Kramer and Sharma (1997) have noted, just as the failure to measure the total benefits of biodiversity protection can lead to suboptimal development policies, the failure to measure the full costs of protection may lead to unworkable conservation strategies (Berman and Bui, 2001 and Lovell and Sunding, 2001)

In Tanzania most of core WPAs are not ringing fenced, consequently allows some of wildlife be found outside WPAs wandering close to areas of agriculture, pastoralist and other socio-economic activities are taking place (Maganga *et al.*, 2007) resulting in human-wildlife conflicts and increasing cost of living close to wildlife habitat (Roselyne, 2007). While this problem exists, as an important natural resource, wildlife needs to be managed in integrated bases as to benefit the communities, government and environment (URT, 2005; Nyakaana and Edroma, 2008). The situation forced the government of Tanzania to adopt new wildlife conservation approach that involves local communities known as Wildlife Management Areas (WMAs)

(Patricia, 2005; Kaswamila, 2012) which are established within the village land where local community uses the land to obtain basic need for their livelihood. Establishment and management of these newly protected areas had substantial negative and positive effects on the livelihoods of residents who lived in and around protected areas and thus undermined local support for conservation or improve their response to conservation (Ferraro, 2006; Formo, 2010). Other critics of protected areas have pointed to the unfairness of excluding local people from access to protected area and natural resources they have used for centuries. Anne (2005), among others; argue that the lack of economic compensation to local people for loss of access has led to a failure of protected areas. They argue that it is necessary to correct this distortion in order to promote wildlife conservation, and suggest that this is achievable through revenue sharing in wildlife related activities. They believe that local people will respond to such benefits by reducing the exploitation of wildlife.

WMAs are the mechanism established for implementing community wildlife management in Tanzania (URT, 2012) its consist of portions of village land set aside for purposes of wildlife conservation and the development of wildlife-based enterprises such as tourism and tourist hunting. However, in many cases, the establishment of WMA has unsuccessful to achieve the desired outcomes, due to a poor recognition of local peoples' rights and practices (IRA, 2007). Ngarambe-Tapika WMA was established in 2003 with the aim to combine wildlife conservation, tourism and rural development by diverting wildlife management and benefits to local level (IRA, 2007). Coppolillo and Dickman (2007) reported that establishment of WMA may significant affects livelihood of adjacent community positively and also negatively. Positive effects is a benefits that community accrued from managing wildlife resources while negative effects is a costs that local community receive by being adjacent to WMA. *Despite its establishment little is known on their development performance in regard to cost and benefit of it to livelihood of the community.*

Many WMAs have been relatively slow to develop faced with the number of challenges which impair them to full fill their objectives of establishing it which is improving the livelihoods of the local people around the WMA (Nelson *et al.*, 2006; IRA, 2007; Igoe and Croucher, 2007; Benjaminsen and Svarstad , 2010)). This thought was necessitates the need to undertake study on costs and benefits of establishment of Ngarambe Tapika WMA on livelihood of adjacent community.

The main aim of this study was to assess the effect of establishment of Ngarambe Tapika WMA on livelihood of adjacent community. Specifically the study focused to assess costs and benefits of establishment of Ngarambe-Tapika WMA on livelihood of adjacent community and

2. MATERIALS AND METHODS

2.1. Location and Description of the study area

This study was conducted in Rufiji district in Coast Region. Rufiji districts is located in the Southern part of the region at latitude 7.28⁰ and 8.23⁰ South and longitude between 37.47⁰ and 39.30⁰. The district has only one WMA exist so far which is Ngarambe- Tapika WMA. The WMA is located south of the district at the southeast edge of the Selous game Reserve (767sq.km). Ngarambe-Tapika WMA lies between latitude 8.076⁰ -8.503⁰ south and 38.413⁰ -38.717⁰ east of the district. The WMA received the AA and User right in 2003 and the association is called MUNGATA ("Muungano wa Ngarambe na Tapika"). It comprises two villages Namely Ngarambe and Tapika (LUP, 2012)

2.2. Methods

Respondents for this study came from Ngarambe and Tapika villages in Rufiji district, Coast region, Tanzania. The multi stage simple random sampling technique was used to draw the sample of the villages that and respondents that were involved in the survey. The first sampling stage employed the purposive to select two villages which were involved in establish of WMA Ngarambe and Tapika wards were selected. The next stage was the sampling of respondents. The sampling process required the development of a sampling frame, which in this study was the current list of all people involved in establish of WMA contained in the household list in the government office in collaboration with the Village Executive Officer (VEO) in each village. The simple random selection technique was used in order to increase validity and reduce bias. Based on the number of the people involved on establishment of WMA in villages, a sample of 90 Respondents was selected, 60 from Ngarambe and 30 from Tapika

A structured survey instrument was developed. A respondents was requested to answer the questions independently which was interviewed by the researcher. The information collected was the costs and benefits of WMA on livelihood. Data collected were coded and analyzed. The financial profitability consists of the "benefit-cost ratio (B/C Ratio)". The financial indicators were annual cost due to WMA establishment which include resources which were harvest/collect from the Ngarambe-Tapika WMA, cost of WMA establishment

incur due to establish of WMA from agriculture, depression of livestock and benefits due to WMA which includes employment, meat and sugar.

3. RESULTS AND DISCUSSION

3.1. Costs and benefits of WMA establishment to livelihoods of adjacent community

3.1.1. Livelihood activities carried out in Ngarambe-Tapika WMA before its establishment

Cultivation, hunting, firewood collection, settlement, charcoal burning and wood making were the major activities carried out in Ngarambe-Tapika WMA before demarcating as a protected area. The results shows that cultivation was the major leading (92.2%) livelihood activities carried in Ngarambe-Tapika WMA before its establishment, the other livelihood activities were firewood collection (60.0%), hunting (15.6%). It was further reported that charcoal burning were the least kind of livelihood activities carried out in Ngarambe-Tapika WMA. This was because most of residents in Ngarambe and Tapika villages use firewood for cooking and some time use as a source of income. Also low response of charcoal burning might be influenced by the fact that transportation of these goods to nearby township was difficult due to rough road.

Furthermore the study found that 13.3% of the respondents were settled in the area meaning that they livelihood were totally depending on resources available. Kingalawe and Noe (2012), reported that local livelihoods Mgombasi and Nambecha villages (community living adjacent to Mbarang'andu WMA) depend heavily on natural resources. However, the level of dependency on biodiversity resources such as game and forests products, fisheries, and agro diversity varies from one resource to another and is determined by the availability and access to the resource in question.

3.1.2. Activities carried out in Ngarambe Tapika WMA after its establishment

The study revealed that majority of the respondents stop continuing with the livelihood activities that were carried out before establishment on WMA (Table I). This is due to reason that establishment of protected areas goes hand in hand with formulation of by laws that impose some restriction on accessing resources. Also the policies and regulations that governing establishment of WMAs has documented which activities are legally allowed in the WMAs and other are illegal. According to the Ngarambe Tapika By law, Settlements, cultivation, charcoal burning and wood making activities were totally prohibited activities in the WMA, hunting and firewood collection were allowed with written permission from AA.

The Policy calls for local communities to be given responsibility and rights for wildlife management on village lands so that they can benefit and value wildlife as a form of land use (URT, 2002). Establishment of WMA ensures local communities to manage and benefit from the wildlife on their lands is through creating Wildlife Management Areas (WMA's). Due to local people participation as well as realizing advantages of conserving WMA it influences them to stop continuing with those livelihood activities which threaten sustainability of the wild animals.

It was found that very few of the respondents (3.3%) continue with cultivation activities though always facing problem with wild animal laid their crops. These were attributed to the fact that even those who shifted their activities to other area outside the WMA were not compensated and were supposed to start again by clearing bushes. Also the study revealed that 4.4% of respondent continues with hunting activities but with permission from WMA authority. Although illegal hunting is prohibited to ensure conservation of wild animals some continues due to basic livelihood needs and values and perceptions of what is beneficial, as well as community norms on appropriate and legitimate use of local wildlife resources (Arjunan *et al.*, (2006), Tomicevic *et al.*, (2009) and Manfredo (2008)).

Restriction of local community from accessing basic livelihood needs increase costs of living to those people because they livelihood were totally depend on natural resource. Anne, (2005) and Paul, (2006) among others; argue that the lack of economic compensation to local people for loss of access has led to a failure of protected areas. They argue that it is necessary to correct this distortion in order to promote wildlife conservation, and suggest that this is achievable through revenue sharing in wildlife related activities. Kidegesho, (2008) narrates that costs of living adjacent to PA is a cost resulting from forfeiting a use or value for the sake of backing an alternative use or value. Conservation is a choice that requires rural communities to sacrifice their values and uses for the sake of sustaining wildlife. These values or uses include arable lands, grazing lands, plants of medicinal value, bush meat, fuelwood and sacred shrines. Very often, under conventional conservation approach, these sacrifices are not voluntary. They normally take a form of coercive and forcefully eviction of people from their traditional lands and strict prohibition of resource use (Balduis *et al* 2001).

Table 1: Livelihood activities carried out in Ngarambe-Tapika WMA before and after WMA establishment

| Activities | Before WMA | | | | After WMA | | | |
|---------------------|------------|------|----|------|-----------|-----|----|-------|
| | Yes | | No | | Yes | | No | |
| | N | % | n | % | n | % | n | % |
| Cultivating | 83 | 92.2 | 7 | 7.8 | 3 | 3.3 | 87 | 96.7 |
| Hunting | 14 | 15.6 | 76 | 84.4 | 4 | 4.4 | 86 | 95.6 |
| Firewood collection | 54 | 60.0 | 36 | 40 | 0 | 0 | 90 | 100.0 |
| Settlement | 12 | 13.3 | 78 | 86.7 | 0 | 0 | 90 | 100.0 |
| Charcoal burning | 1 | 1.1 | 89 | 98.9 | 0 | 0 | 90 | 100.0 |
| Wood making | 29 | 32.2 | 61 | 67.8 | 0 | 0 | 90 | 100.0 |

3.1.3. Resources harvested/collected before and after Ngarambe Tapika WMA establishment

The finding revealed that Wild fruits, Timbers, Game meat, mushroom, Honey and fish were resources collected by few respondents in the study area before establishment of Ngarambe Tapika WMA (Table 2). 37.8% of the respondents were collecting honey while 31% were mainly engaged in timber making, meaning that they were harvesting timber and transport it to the nearest township. Also few people were engaged in fishing (12.2%)

The principal natural resources in WMAs include forest, wildlife and fish. Although highest priority is currently given to wildlife utilization as the main activity, all other natural resources should also be considered in the utilization schemes of the WMAs (Wilfred, 2010). However, a study on economic opportunities in WMAs identified, among others, four main economic openings through which rural communities can optimize the use of W MAs. These are: subsistence hunting, non- consumptive tourism, beekeeping, and utilization of forest resources (Christophersen, (2000) and Arntzen, (2003)). To make effective use of these opportunities calls on the local communities to be equipped with resource utilization technologies and entrepreneurial skills. Similar finding revealed from this study that honey collection was the major resources continue to be done by most of the respondents after establishing the WMA and it was done traditionally making it difficult to get profits. This was due to reason that honey making was associated with conserving the environment and hence led into conservation of wild animals. Beekeeping in Uyumbu and Ipole WMAs, for example, has been one of the important economic activities among the villages involved in the WMA projects (Kaswamila, 2013). Yet in order to enable local communities to expand their beekeeping enterprises, training and firm market structures are needed (Carol, 2002)

Timber making was only resource restricted to be collected in the WMA after its establishment due to the facts that, it course deforestation hence degradation of wildlife habitat. Other resources were allowed with specific permit approved by the AA to be collected but people were feared due to increase number of dangerous wild animals (LUP, 2012). Restriction to access timbers increases costs of living among respondents as some were total depending on these activities to run they live. One of the respondent claimed that since they were restricted to access timber in the WMA none of the youth generation has managed to build and roof house by iron most houses which were roofed by Iron they were there before establishment of WMA. Therefore they were claiming that WMA establishment increases burden of living. To overcome these situation sustainable natural resources accessibility plans should also be developed and clearly documented in WMA. To enhance resource accessibility and reduce conflicts, all the stakeholders in WMA projects are obliged to observe important roles played by all the institutions involved. Institutions provide “rules of the game. Proper institutional arrangement s will provide a good link between WMAs and local communities (Norfolk, 2004).

Table 2: Resources harvested/collected from the Ngarambe-Tapika WMA before and after WMA establishment

| Activities | Before WMA | | | | After WMA | | | |
|------------|------------|------|----|------|-----------|-----|----|------|
| | Yes | | No | | Yes | | No | |
| | N | % | n | % | n | % | n | % |
| Fish | 11 | 12.2 | 79 | 87.8 | 6 | 6.7 | 84 | 93.3 |
| Game meat | 17 | 18.9 | 73 | 81.1 | 6 | 6.7 | 84 | 93.3 |
| Mushrooms | 17 | 18.9 | 73 | 81.1 | 0 | 0.0 | 90 | 100 |

| | | | | | | | | |
|--------|----|------|----|------|----|------|----|------|
| Honey | 34 | 37.8 | 56 | 62.2 | 20 | 22.2 | 70 | 77.8 |
| Fruits | 1 | 1.1 | 89 | 98.9 | 0 | 0.0 | 90 | 100 |
| Timber | 28 | 31.1 | 62 | 68.9 | 0 | 0.0 | 90 | 100 |

3.1.4. Cost due to establishment of Ngarambe-Tapika WMA to the livelihood of adjacent community Crop damage

The results shows that, on average local community loose 479,000.00 Tsh from agricultural activities per year (Table3). It is evidenced that agriculture is the principal lifeline support entity to rural Tanzanians. It contributes to over 90% of food security and 60% of the household income of the rural people (NBS, 2002; URT, 2008; Lambert *et al.* 2012). However, a plethora of factors such as low soil fertility, insect pests, low technological inputs, unpredictable weather and lack of credits and markets constrain the sector. Some of these factors were not applicable in Ngarambe and Tapika Villages during study period as it was reported that local community do not use fertilizer due to natural fertility that land has. It was also reported that the big enemy in agriculture to the communities living side by side with wildlife suffer the extra losses due to damage wild animals inflicts on croplands. The finding is in line with (Kidegesho, 2008) who reported that Wild animals may result up to over 90% losses in crops.

Crop damage was there even before establishment of WMA but the rate destruction was minimal as compared to the situation when this study was conducted. This was attributed with facts that before WMA establishment local communities were able to kill and chase animal when they entered into their field. So animals were always running aware. After WMA establishment the rate of crop damage has increases due to the facts that the number of wild animals has increase due to protection and local communities were restricted by WMA by law from killing animals, they were only allowed to inform VGS. But due to the adequate conservation instrument like vehicle and guns it takes time for the VGS to reach area of effects. And some time they were support to inform DGO for more assistance. Respondents claimed that they have to stay in their farm chasing wildlife for the whole period form time when plants germinate to harvesting. This finding is in line with Kidegesho (2008) narrates that in addition to direct economic losses resulting from crop damage, there is also an element of foregoing other social and economic activities as substantial amount of resources and time are directed on guarding crops against vermin.

Kangalawe and Noe (2012), conducted a study in two villages in Namtumbo District that have wildlife resources and have been involved in conservation for the past two decades, they found that wildlife resources have not contributed to the household needs, either for cash or food security. Instead, wild animals were reported to very often destroy standing crops and prey on livestock, causing economic losses to farmers. Thus the evident need for agricultural expansion seems to be in conflict with the need for expansion of wildlife areas (Anne, 2005). Already wild animals are locally considered a concern that touches on issues of safety a food security. The evidence suggests that wildlife damage can cause a loss of up to approximately 60% of total crop yield or income. For example, during a 30 day study in Ghana an average of 48% of crops were lost to elephants (Dyson, 2010)

Table 3: Cost due to establishment of Ngarambe-Tapika WMA

| Sources | Cost (in which units)* | |
|-----------------------|------------------------|-------------|
| Agriculture lost | 479,000.00 | +21,890.00 |
| livestock depredation | 132,000.00 | +33,530.00 |
| Hunting | 729,000.00 | +110,700.00 |
| Collecting timber | 2,650,000.00 | +219,800.00 |

***Mean + one standard error of the mean Cost from Timber**

The result shows that on average respondents who livelihoods were depending on natural resource especially on timber making loss Tshs 2,650,000.00 annual (Table3). Before Ngarambe Tapika WMA establishment local community were used to make timbers in an area and transport to nearest town for selling though it was illegal none were responsible for that. They are used to generate more money from timber than in other economic sector like agriculture due to the fact that timber and non timber products are expensive hence people engaging on making timber they earn more income. After WMA establishment this activities were stopped and prohibited so local community were no longer generating income from Timber. Babulo and Muys (2008), reported that among forest communities, dependence on the forest and its resources ranges from partial to full, according to wealth. They further argued that with increasing poverty people depend more on the forest resources to provide incomes since they do not have the means or skills to find more profitable sources of income (FAO, 2014). The anecdotal evidence has shown that the displacement (physical and resource)

caused by PAs has led to various types of impoverishment through landlessness, joblessness, homelessness, marginalization, food insecurity, increased morbidity and mortality, loss of access to common property resources, and social disarticulation (Cernea and Soltau, (2006); Mombeshora and Le Bel (2009)).

Denial to harvest forest and non-forest products from the WMA was also seen as a cost. The village by-laws prohibit local communities to enter into the conserved area without permission from the village government. This has made local communities unable to freely access forest (poles, timber, charcoal etc.) and non-forest (grass, honey, wildlife etc.) as they used to do before the area attained the WMA status. Denial of local communities to harvest forest products has accelerated deforestation in areas outside the WMA. This is due to the fact that firewood is the only source of domestic energy and the only place to fell trees are those outside the WMA. In addressing the problem of resource access within the WMA, the village governments should set aside special days to allow local communities to harvest dead trees and/or medicinal plants under the supervision of VGS (Kaswamila, 2012)

Cost due to livestock depredation

Livestock plays a vital role in the local economy of rural Tanzanians. It is an important source of protein, income or commercial asset. Other than economic role, livestock also plays an important social role. It is a symbol of status in many tribes and it serves as a commodity that can be exchanged for a wife i.e. bride price. So a loss of livestock implies not only economic loss to rural communities, but also a huge social cost (Kidegesho, 2008). The findings from this study revealed that in average local community loss Tshs. 132,000.00 per annual from livestock (Table3). Most livestock kept in Ngarambe and Tapika Villages are Chickens and Ducks. Local communities do not keep cattle and goat because of wildlife. One of the respondent said that they do not keep cattle because if they do that they have invited lion and cheater to live with them. This finding is in line with Coppolillo and Dickman, (2007), reported that the costs of living with wildlife for pastoralists in the Ruaha Landscape are that most pastoral households reported losses of their cattle to carnivores. Reports varied from 0 to 12 cattle, but households averaged 0.34 animals lost during the year

Cost due to hunting

The result shows that after Ngarambe Tapika WMA establishment local community loss TShs. 729,000.00 per annum from game hunting. This mean before WMA establishment the area was free accessible and local community were able to hunt numbers of wild animals though was no allowed. But after WMA establishment hunting is no longer for free is for specific permit issued by Wildlife Division and the permit depends on availability number of animals.

3.1.5. Benefits due to establishment of Ngarambe-Tapika WMA

It was found the major benefits gained after establishment of WMA were meat and employment with an annual income equivalent to 700,000.00 and 443,000.00 for meat and employment respective. Game meat includes meat soled to local community by investors (Frontier). The investor was allowed to hunt wild animals and sell to local community at very low charge in such a way that every community was able to afford to buy such meat. This was termed as a profit to local community. Low income from employment might influenced by the fact that most of the respondents are employed on the unskilled labour associated with low salary of 30,000/= TShs per month. Most of employees were working as a security guide to a investor who has been brought in by the central government not the WMA association which is contrary to the Wildlife management area regulation. This finding is in line with that of Kaswamila (2012) who reported that a total of 39 people were employed (permanent and casual) by seven investment companies as cooks and security guards in Minjingu and Vilima Vitatu with an average monthly wage of TZS.90,000. Formo, (2010) and URT (2012)) insist use of Village Game Scout (VGS) to assist the tourist hunting company while on safari to assess whether the company is abiding their hunting prescription. This might have forced the investors to pay VGS good wages as opposed to the current situation.

What this means is that the only employment the game scouts had with the hunting company was as security guards at the tourist camp. When asked about the cooperation between the hunting company and the villages, the camp manager at the Game Frontiers tourist camp was somewhat reluctant to specify whether or not they used the village game scouts or district game scouts for tourist hunting. He did, however, confirm that the camp sometimes employed the village game scouts as security guards. In addition to providing the scouts and their families with extra cash income, this would give the MUNGATA a means to calculate the percentage they should receive from the Wildlife Division at the end of each hunting season. This was unfortunately not the case in Ngarambe and Tapika. At the time of the fieldwork, game scouts from the district rather than the village were supervising the trophy hunting. Both the MUNGATA and the village game scouts

were well aware of this and especially the scouts were unhappy with not being employed by Game Frontiers. One game scout from Tapika expressed his frustration in this way: “ Instead of supervising the hunting, we are only allowed to supervise the luggage of the tourists. Other individual benefits gained as a result of WMA establishment was aid of Maize flour and sugar from investors which was happened once since its establishment (Table 4).

Coppolillo, P. and Dickman, A. (2007), reported that a common misperception is that the protected areas of the Ruaha Landscape “lock up” resources. Closer examination reveals that these areas hold tremendous economic potential and that the perceived lack of benefits actually reflects a structural problem: the diversion of conservation revenues to central government and private entrepreneurs. It is understandable for local people to think there are no financial benefits from conservation because they are quickly whisked out of the landscape and disappear into the central treasury. This is an important distinction because it means that protected areas and conservation have the potential to contribute to local livelihoods, but at present they are not doing so.

Table 4: Benefits due to establishment of Ngarambe-Tapika WMA

| Sources | Mean +SEM | |
|-------------|------------|------------|
| Buying meat | 700,000.00 | 0.00 |
| Employment | 443,000.00 | +90,810.00 |
| Maize flour | 142,000.00 | +4,735.18 |
| Sugar | 138,000.00 | +2,105.26 |

3.1.6. Benefit Cost ratio

Since the benefit cost is less than 1 (Table 6), the benefit of the investment is less than the annual cost of the income generated before establishment of Ngarambe-Tapika WMA. This implies that after the establishment of WMA the annual income of local community goes down. This could have negative impact on the livelihood of the local community. The preceding discussion has shows that although local people obtain tangible benefits, that act as an incentive to conservation initiatives but is low as compared to what they use to gain before establish of WMA. When asked about their income whether similar to the income used to get before WMA establishment 90% of respondents replay that their income after WMA establishment is less compared to before. The effects of changing their income were ranked between 10-50%. This means that most of the respondents were totally negatively affected by WMA establishment.

Table 5: Benefit and Cost due to WMA establishment Ngarambe-Tapika WMA

| Parameter | Mean +SEM |
|--|--------------------------|
| *Average annual cost due to WMA establishment | 2,651,111.11+ 154,234.56 |
| Average annual benefits due to WMA establishment | 449,766.67+ 56,457.23 |
| Average benefit cost ratio | 0.32 |

*average annual cost and benefits is calculated per individual

3.1.7. Community received benefits due to establishment of WMA

Findings in Table 6 show that 54.4% of the reported that, due to WMA there were able to repair three classroom in village school. During an interview, some of the households reported that their schools in the village receive support from WMA. It was found that WMA have contributed a desks and construction of school buildings such as four class rooms and teachers’ house as well as providing teaching materials in the study area. The findings are in line with the study conducted by Igoe, and Croucher. (2007) found improvement in education was due to support by tourist industry. Also the finding is in line with Kaswamila (2012) reported that, local communities were asked as to whether they are aware of the use of revenues paid to the WMA by investors and its uses in socio-economic development at village level. Results indicate that the funds were mainly used for provision of social services (construction of classrooms, dispensary and village government offices), payment for allowances to WMA staff during meetings and seminars, bursary to students, and in supplementing to village government revenues

Findings in the Table 6 show that majority of the respondents (51.1%) reported well construction. While very few (10.0%) opened the small business to sell food to tourist. This is small number compared to the number of households in the area. This is due to reason that it is expensive to open the restaurant which tourist they can attend and eat food which low quality. Furthermore, the study found that only14.4% of the respondents reported that WMA created jobs. It was found that most of the respondents employed work in unskilled jobs.

Table 6: Community benefits received after establishment of WMA

| Benefit | N | % |
|---------------------------|----|------|
| Repair school | 49 | 54.4 |
| Open food business | 9 | 10.0 |
| Water pump | 46 | 51.1 |
| Electricity | 4 | 4.4 |
| Provide school facilities | 50 | 55.6 |
| Employment | 13 | 14.4 |
| Repair dispensary | 33 | 36.7 |
| Well construction | 28 | 31.1 |

4. CONCLUSIONS AND RECOMMENDATIONS

The study revealed that cultivation and firewood collection were the major livelihood activities carried out before establishment of Ngarambe-Tapika WMA. It was further revealed that most of the respondents' stops carrying out the livelihood activities which impair conservation of wildlife. The study concluded that;

- Although local community stop engaging on the livelihood activities which affect conservation of wild life but they benefit cost ratio is less than 1, implying that that the benefit they were receiving is low as compared to the income they were generated before establish of WMA
- Most respondents depends on agriculture activities as a major economic activities and source of income but this activities had been interfered with wild animals that raid their crops hence increases cost of living of adjacent community. This has been incidence are increasing yearly due to increase number of wildlife as a result of conservation.

Recommendation

- To address problem of resource access within the WMA, the study recommend that, the village governments should set aside special days to allow local communities to harvest dead trees and/or medicinal plants under the supervision of VGS. A long-term solution is to advocate the establishment of community forests in each village or households to have forest lots around their farms which could save the multi-purpose role of provision of firewood/timber and also act as farm boundaries
- The AA should find a way of compensating local community who are totally affected by wildlife especially when come into issue of crop damage.
- To minuses some costs of living and increase benefits it is recommended to improved relationship among investors, local communities and WMA staff, the need to involve local communities in major decisions affecting their livelihood, improvement of business contracts, need for investors to follow village rules and regulation, awareness education and empowerment of local communities should be adhered.
- Furthermore, the study recommends that efforts should be made to ensure that income generating from Ngarambe Tapika WMA trickle down to household and/or individual level because most who are affected is individuals and when households or individuals benefit that local communities are likely to conserve. And this can be achieved through increased employment of local community and well paid.

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