

ABSTRACT

A study to evaluate the implementation of Wildlife Management Areas (WMAs) with reference to Twatwatwa pilot WMA Kilosa district was conducted from October 2007 to December, 2007. Specifically the study assessed the involvement of local communities in the pilot WMA, assessed the capacity and ability of communities in the process required for the implementation of pilot WMA, identified the benefits and damages to local communities as a result of pilot WMA implementation and found out the contribution made by facilitators towards WMA implementation. A cross sectional research design was adopted. Data collection process involved the use of structured questionnaire. Sampling intensity was set at 10% for Twatwatwa , Mbwade and Rudewa villages while a 5% sampling intensity for Msowero village was adopted. A total of 280 respondents were involved in this exercise. To supplement the information obtained from questionnaire, key informants and focus group discussion were used. The data collected by questionnaires were analyzed using Statistical package for social sciences (SPSS) computer software. Chi square (χ^2) was used to test the association between respondents' level of education and their involvement in pilot WMA activities. Results showed that there was a significant association between the two variables ($p < 0.01$) Results for education level indicate that 67.9% of respondents had primary education, 3.6% secondary education, 19.6% had no formal education while 8.9% had adult education. The results indicate that the highest number of the respondents (51.1%) was aged between 31 and 45 years. Most of respondents (93.6%) were males while 6.4% were females. A significant number of the respondents (76.6%) were married. Results showed that 85.0% of respondents were engaged in

agriculture while only 15.0% were engaged in livestock keeping. The majority of villagers (95.0%) were not involved in pilot WMA activities ever since the implementation of WMA became stalled. The highest number of respondents (97.1%) indicated that villagers were not capable to implement WMA on their own. Most of the respondents (71.0%) had no benefits from pilot WMA. Contributions made by facilitators towards WMA implementation were not enough. The study concludes that implementation of Twatwatwa WMA stagnated mainly due to conflict between peasants and livestock keepers as well as due lack of funds that was supposed to come from the Government and NGOs. Furthermore, villagers were no longer involved in pilot WMA, had no capacity and capability to implement the WMA on their own owing to lack of expertise, had fewer benefits than costs and had received inadequate contributions from the Government and NGOs for the purpose of WMA implementation. The study recommends that the Government must help member villages to permanently resolve their conflict. Government should assist villagers to acquire funds for WMA implementation process. Villagers need to be educated on WMA issues as this will enable them to become involved in the daily running of the WMA.

DECLARATION

I, AUGUSTINE FELICIAN KALIMBA do hereby declare to the SENATE of Sokoine University of Agriculture that this dissertation is my original work and it has neither been submitted nor being concurrently submitted for degree award in any other University.

Augustine Felician Kalimba

The above declaration is confirmed:

Prof. S. L. S. Maganga

Supervisor

Date

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DEDICATION

This work is dedicated to my beloved late parents Felician and Susanne who answered the call from God before witnessing my current struggle.

ABBREVIATIONS

AA	Authorized Association
ADMADDE	Administrative Management Design
AWF	African Wildlife Foundation
CARE	Co-operative American Relief Everywhere
CAMPFIRE	Community Areas Management Program for Indigenous Resource
°C	Degree Centigrade
CBC	Community Based Conservation
CBNRM	Community Based Natural Resource Management
CBO	Community Based Organization
EIA	Environmental Impact Assessment
<i>et al.</i>	et alli (and others)
i.e.	id est (that is)
IIED	International Institute of Environment and Development
ICDP	Integrated Conservation and Development Projects
IUCN	International Union for Conservation of Nature and Natural Resources
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
FZS	Frankfurt Zoological Society
LIRDP	Luangwa Integrated Rural Development Project
MNRT	Ministry of Natural Resources and Tourism
NGO	Non Government Organization

SCP	Selous Conservation Programme
SPSS	Statistical Package for Social Sciences
TANAPA	Tanzania National Parks
TAS	Tanzanian Shilling
UMNP	Udzungwa Mountains National Parks
URT	United Republic of Tanzania
WMAs	Wildlife Management Areas
WPT	Wildlife Policy of Tanzania
WSRTF	Wildlife Sector Review Task Force
WWF	World Wide Fund for Nature

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

One of the most common problems encountered by local people when protected areas were formed was the restriction of access to resources. Western concepts of protected areas have for a long time been based on exclusion of people. In many cases, local people or indigenous people, who had used lands for very long periods of time, had been arbitrarily barred from certain areas, with little recognition of the ethics, legitimacy or consequences of such actions, on the presumptions that protection of lands from local or indigenous people was necessary for conservation. In some situations, there were negative ecological and hence conservation consequences of removing people from lands, although these were often only recognized after sometime (Primack, 1993). This is not to suggest that local activities are always beneficial or benign to conservation.

The increasing human populations, perhaps due to better health or food services, has had a negative impact resulting in the decline in resources because of shrinking habitats meaning that, the activities of local people are no longer compatible with conservation goals. It is in these cases that local solutions need to be developed that take into account the needs and desire of local people and conservation goals. Wildlife management areas (WMAs) are one of the solutions that were adopted to change the relationship between government and local people from hostility to friendship in Tanzania.

The purpose of WMAs, as provided in the Wildlife Policy of Tanzania (WPT), is to enable local communities to benefit from wildlife in order to give them incentives to conserve wildlife on their village land (MNRT, 1998). This is WPT's main conservation strategy for wildlife outside protected areas and is also an important official strategy for rural development and poverty reduction. By 1998, when the wildlife policy was released formally calling for the creation of WMAs on community lands adjacent to protected areas, the WMA concept had been under discussion for nearly a decade. As the policy was developed, the country's wildlife management strategies were reviewed (Leader-Williams *et al.*, 1996). Many localities had provisional WMAs marked out on the ground and in village plans. Villages participating in the Selous Conservation Programme (SCP) had already been granted a meat quota by the Wildlife Division (a form of limited user rights) and were carrying out local meat sales (Nelson *et al.*, 2006).

1.2 WMA Regulations and Pilot Areas

In January 2003, the Ministry of Natural Resources and Tourism (MNRT) formally launched the WMAs formation process. This was after the Regulations and the Guidelines had been formally issued in December 2002 and thus paving the way for the formation of WMAs (URT, 2005). The Regulations included a list of sixteen pilot areas where the WMA initiative would be tried and evaluated. These included Wamimbiki, Makame, Endoimet, Ikoma, Loliondo, Ipole., Burunge, Twatwatwa, Idodi - Pawaga, Songea, Ngarambe - Tapika, Liwale, Tunduru, Uyumbu, Jukumu and Tarime. The Regulations initially called for this pilot phase to consist of three years, although it was administratively extended. The formation of WMAs is a long

process. It includes the formation of Natural Resource Committees, the Authorized Association (AA), Community Based Organization (CBO), Environmental Impact Assessment (EIA) and Land Use Plans (URT, 2005).

The sixteen pilot areas provided for in the WMA Regulations were spread over sixteen districts (Fig.1). As of December 2008, ten out of the sixteen original pilot WMAs had been officially gazetted and consequently created the following WMAs: Ipole WMA, Sikonge District; Uyumbu WMA, Urambo District; Burunge WMA, Babati District; Ngarambe - Tapika WMA, Rufiji District; Endoimet WMA, Monduli District; Ikoma WMA, Serengeti District; Pawaga -Idodi WMA, Iringa District; Wami Mbiki WMA, Morogoro and Bagamoyo Districts; Tunduru WMA, Tunduru District; and Songea WMA, Namtumbo District. Twatwatwa is one of the sixteen original pilot WMAs yet to be gazetted.

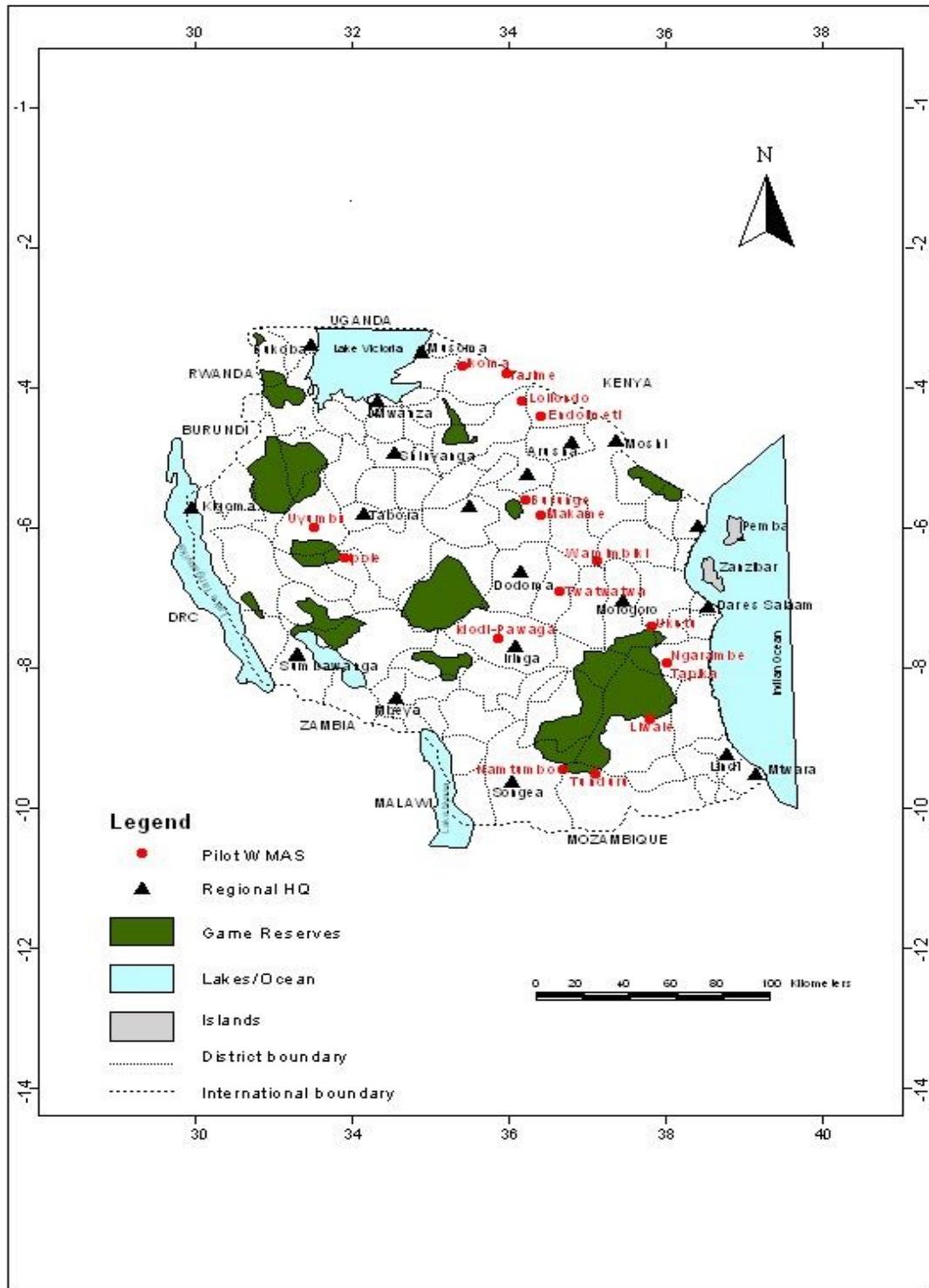


Figure 1: A map of Tanzania showing 16 original pilot WMAs

1.3 Institution Design

The WMA process is an institutional reform process aimed at improving wildlife management on village lands. The underlying problems facing wildlife management outside protected areas is one of the rights and benefits to local land holders. Historically, the state has owned all the wildlife in Tanzania and local people's use is strictly controlled and regulated. The state's ownership of wildlife has also made it the sole proprietor of the lucrative tourist hunting industry and the revenues it produces (URT, 2005). As pointed out in the wildlife policy, this situation creates disincentives for local land holders including private land holders and communally managed village lands to maintain wildlife as a form of land use. The result is that wildlife outside the parks and game reserves has decreased because locals do not value wildlife and the state does not invest sufficient resources in protecting the resource (MNRT, 1998).

Institutionally, the easiest way to transfer management of wildlife to local level would clearly be to give villages through the elected corporate village council authority over wildlife and formal user rights. Secure tenure or user rights over land and natural resources, including wildlife and trees, is crucial if rural communities are to manage them (McNeely, 1995). Local communities need the rights to self determination and so to set their own agenda. It does put responsibility firmly in the hands of those who will earn the benefits and pay the costs (McNeely, 1995).

1.4 Problem Statement and Justification

Although the concept of WMA has been in Tanzania for over a decade, little progress has been achieved in terms of implementation. In Tanzania the shift from preservation to new participatory approaches in conservation began in mid 1980s (Barrow, 1996). The new approach was aimed at integrating conservation and development objectives so that each could be promoted without jeopardizing the other. The pilot WMAs had been initially given a period of three years to complete all the procedures required to acquire a legal status. By 2008 only ten out of the sixteen original pilot WMAs had acquired the legal status. This study intended to evaluate establishment of WMAs with reference to Twatwatwa pilot WMA, Kilosa district. Twatwatwa was chosen to find out why it had failed to be gazetted. There had been no thorough study about the potential and limitations of an area to attain a fully fledged WMA status. Findings from this study will be beneficial to decision makers on how best to carry on with the implementation process.

1.5 General Objective

The general objective of this study was to evaluate the process of establishment of WMAs with reference to Twatwatwa pilot WMA.

1.5.1 Specific objectives

- (i) To assess the involvement of local communities in the Twatwatwa pilot WMA.
- (ii) To assess the capacity and ability of communities in the processes required for the pilot WMA to be gazetted.

- (iii) To identify the benefits and damages to local communities as a result of pilot WMA implementation.
- (iv) To find out the contribution made by the facilitators toward WMA implementation (e.g. Government Agencies and NGOs).

1.6 Research Questions

- 1) What is the current status of Twatwatwa pilot WMA?
- 2) How are the local communities involved in the pilot WMA?
- 3) What is the capacity and capability of local communities in the establishment of Twatwatwa pilot WMA?
- 4) What benefits and damages were incurred by local communities as a result of the pilot WMA?
- 5) What are the economic activities of local communities?
- 6) What are the incentives and disincentives for peoples' participation in the pilot WMA?

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Indigenous People and Biodiversity Conservation

People have traditionally harvested, hunted, and searched their environment for the food and other resources that they need to survive. Many studies have shown that rural people in developing countries have intimate knowledge of their natural environment (including plant and animal life as well as climate and soils) and of environmental processes. They make rational resource management decisions based on that knowledge. Communities have well established systems and carefully developed techniques which over many years, allowed them to survive in harsh conditions (Van Vlaenderen and Nkwati, 1993). As long as human populations were low and the methods of exploitation were unsophisticated, people could often use the plants and animals of their environment without driving species to extinction. However, as human populations have increased, their use of the environment has escalated as well. People use natural resources such as fuel wood, wild meat and wild plants, and people convert vast amounts of natural habitats to agricultural and residential purposes; therefore population growth is partially responsible for the loss of biological diversity.

In traditional societies, controls often existed to prevent the overexploitation of natural resources. The rights to specific harvesting territories were rigidly controlled; hunting in certain areas was banned; there were often prohibitions against taking females, juveniles and undersized individuals; certain season of the year for harvesting were not allowed. These restrictions, which allowed traditional societies

to harvest communal resources on a long term sustainable basis, are almost identical to the rigid fishing restrictions developed for many fisheries in industrialized nations (FAO, 1988).

2.2 Colonial Period and Biodiversity Conservation

Tanzania wildlife management has, throughout all of its history dating back to the colonial period, been based on protected areas like national parks and game reserves and restrictive laws preventing hunting of wildlife (Maganga, 1999). Since the colonial period, efforts were to preserve wildlife through the establishment of forest reserves and national parks. Pastoralists living on the periphery of gazetted national parks such as the Serengeti and Manyara were evicted to protect the parks from poaching and encroachment. In the wake of independence such wildlife parks have been increased to cover almost 70 percent of the grazing resources of Maasailand (IIED, 1994; Homewood and Rodgers, 1991). According to Thomson (1997), many of the protected areas were created with little consideration of traditional land use in the areas concerned with little regard to impact on local communities. Ironically, in the pre-colonial period, the local communities had by and large succeeded in evolving systems of resource uses and management which combined livelihood security with resource conservation. The prohibition of human habitation led to a loss of access to varied resources critical to household needs and local communities had little option but to continue using resources within protected areas in contravention of protected areas legislation. The resulting confrontation with government authorities has often led to growing antagonism and in some

communities perceiving interests of conservation to be contrary to community development.

2.3 Evolution of Community Based Conservation (CBC) in Tanzania

The genesis of the WMAs initiatives lies in the late 1980s and early 1990s, when Tanzania's wildlife sector was facing a set of problems which led to the development of new community based conservation. The wildlife sector underwent a crisis in the 1970s and 1980s, as poaching increased dramatically for both commercial and subsistence uses of wildlife. The country lost half of its elephants (*Loxodonta africana*) and nearly its entire black rhinoceros (*Diceros bicornis*), and outside the core protected areas wildlife became increasingly scarce (WSRTF, 1995). The rural communities were not supportive and were against wildlife conservation activities. As a result, some individuals in rural communities collaborated with commercial poachers by being either agents or hosts (Maganga, 1999).

Sales of animal species and their parts has long been a lucrative way of deriving benefits from wildlife. Increased demand for these products have reduced populations of many species, and made it necessary to find ways of protecting them for their continued survival. Even where areas are set aside to protect species, in many cases the value on the black market is great enough to encourage poaching. According to Knox (1990), "the world pays lip service to its love of wildlife at least the large, spectacular mammals. But Asian pharmacists pay astronomic prices for rhinoceros (*Diceros bicornis*) horns to grind into medicine. Yemen men pay more than \$10 000 for carved rhinoceros horn dagger".

Poaching for trade, meat, skins, feathers and trophy, is a threat to the survival of many species. In view of the increasing demand for these products, it is unlikely that the illegal market will subside in future (Mackinnon *et al.*, 1986). Sometimes perpetrators are not free agents but are sponsored by distant individuals. Tackling the sponsors and their markets facilities may be an easier way to stop these crimes than chasing the thieves through the bush (Mackinnon *et al.*, 1986). Responding to this crisis, various things happened.

First a set of new donor-government partnerships were forged to increase law enforcement in the wildlife sector to reduce poaching. The partnership between the German and Tanzanian governments in the form of the Selous Conservation Programme was one of the most important of these partnerships that arose in the 1980s (Songorwa, 1999). Second, the government, again with foreign support, began a review of the country's wildlife management policies in an attempt to develop a policy that would address challenges facing the wildlife sector and the changing political and economic environment in Tanzania in the early 1990s. Thirdly, the government, through both Tanzania National Parks (TANAPA) and the Wildlife Division began emphasizing greater collaboration with local communities as part of its protected areas management strategy. It began to be accepted by these authorities that wildlife management needed greater involvement and support from local communities if it was to be successful. This collaboration was based on mutual benefits between conservation agencies and local communities. For example, TANAPA's role was to help support small projects such as schools, dispensaries and shallow wells in villages bordering parks. The park management was on the other

hand asking local people to assist with certain activities that would help meet the park's objectives, i.e. conservation.

2.4 Community Based Conservation (CBC) and Resources Access by Local Communities

In the developing world, a rigid separation between lands used by local people to obtain natural resources and strictly protected areas is often not possible (McNeely and Miller, 1984). Many examples exist in which people are allowed to enter protected areas periodically to obtain natural products in biosphere reserves. For example in Udzungwa Mountains National Park (UMNP) Tanzania, local people are allowed to use some resources in designated buffer zones (WWF, 2007). Unlike other parks, UMNP allows access to some resources like deadwood twice a week, harvesting medicinal plants and thatch grasses through a special permit given by the park. In another example, local people were allowed to collect canes and thatch grass from Chitwan National Park in Nepal (Lehmkuhl *et al.*, 1988). Large game animals are harvested for meat in many African game reserves (Lewis *et al.*, 1990). Through such compromises, local people are considered in local management plans to the benefit of both the people and reserve.

There is now an increasing recognition that involvement of rural people is the crucial missing element in conservation management strategies. Top-down strategies, in which governments try to impose conservation plans, need to be integrated with bottom-up strategies in which villages and other local groups are able to formulate and reach their own development goals (Clay, 1991). This will not only ensure

sustainable use of natural resources but also will ensure rural development. The provision of economic incentives and dismantling of economic disincentive are thus a necessity for biodiversity conservation. The coalescing of development and conservation gave rise to community based conservation or community based natural resource management (CBNRM), a participatory model which has provided the opportunity for conservation to produce tangible benefits for rural development (Wells *et al.* 1992; Munasinghe and McNeely 1994; Western and Wright, 1994; Steiner and Rihoy, 1995). In this respect, CBNRM appears to be born out of the uneasy marriage of economic necessity to yield income from diminishing biophysical resources with a final departure from non-collaborative, bureaucratic and non-participatory planning models (Wainwright and Wehrmeyer, 1998). One of tenets upon which CBNRM programs are based is the idea that local people poach animals simply to generate income or to provide food for their household (Barrett and Arcese, 1995). This design fails to recognize, however that not all community members respond to economic incentives, and that many cultures vest hunting with great non-pecuniary importance (Gibson and Marks, 1995). For example, in the Serengeti, the desire to hunt is so strong for some traditional groups, that neither the provisioning of meat and cash nor the risk of arrest is enough to dissuade hunters from poaching (Barrett and Arcese, 1995). It is this steadfast sense and need for tradition that is not recognized or included in the design of CBNRM programs that too easily limit human motives to western economic rationality. Some of the most significant benefits of community management are in the area of empowerment.

Shifting substantial management control over ecosystem to communities gives them a voice where often they had none. It often restores traditional rights such as water user rights, forest products collection rights or fishing rights that may have been lost as modern states centralized their authority. The shift in resource control also exerts a substantial psychological effect on communities that may be even more important particularly for the poor.

The empowerment dividend is often augmented as local community members gradually develop the accounting, monitoring, planning and dispute resolution, skills that good resource management demands (Shyamsunder *et al.*, 2004). The benefits of such new personal and group skills spill over into domain well beyond resource management.

2.5 African Countries' Experiences on Community Based Conservation

The success of Community Area Management Programme for Indigenous Resource (CAMPFIRE) in Zimbabwe, the Luangwa Integrated Rural Development Project (LIRDP) and the Administrative Management Design (ADMADE) both in Zambia provided both inspiration and models for a wide range of participatory wildlife management projects an initiative that has subsequently been started around the world (IIED, 2000). CAMPFIRE was, according to Murindagomo (1990), designed to give full control of wildlife management to local communities. Metcalf (1993) described it as an attempt to make a social link with the ecological and economic objectives of the Zimbabwe's Park and Wildlife Act 1975. The Act allowed landholders to manage wildlife for their own benefit. The changes to this Act were

prompted by the realization that the protected areas network was in danger of becoming unviable as wildlife declined on surrounding private and communal lands, and that a way was needed to encourage wildlife conservation on these lands. This Act paved the way for a different form of management to evolve. The Act encouraged private land holders to farm or manage wildlife on game ranches, but it also made a provision for district councils to be designated as “appropriate authorities” for managing wildlife on communal lands.

According to Ashley (1995) community based projects in Namibia have been developed by local NGOs and the Ministry of Environment and Tourism. Non-consumptive activities seem to be a potential source of income for community from wildlife. The government was very successful in establishing partnership between private investors and local community through the development of natural resource based business ventures in community area. In a similar way, WMAs are expected to form partnership with private investors.

The CBNRM approach in Namibia has enabled the government to change from implementing to supportive role. The CBNRM program managed to develop and promote the conservancy approach. Under this approach communities were granted rights over wildlife and tourism within village boundaries after forming the conservancy and management plan accepted by responsible Ministry.

Examining the selected models for community participation in Africa, three types of community conservation projects emerge. They are outreach programs (exemplified

by Community Conservation Service (CCS)) of TANAPA, the Community Based Natural Resource Management, and the Integrated Conservation and Development Projects (ICDPs). The first scheme seeks to enhance the role of protected area in regional planning context. The second advocates sustainable management of natural resources through returning control over these resources to the community. The ICDPs intend to promote socio-economic development and provide with income sources that do not threaten natural resource base (IIED, 1994).

2.6 NGOs, Resources Management and WMAs

Foreign NGOs are typically financially strong being financed by their home governments and in many occasions, do finance activities of the local African NGOs and have, more often their own self interests which become the primary purpose and guide for their action (Mwansa, 1995). It has been extensively documented that, NGOs have increasingly been at the centre of the renewed search for promotion of sustainable natural resources development and management particularly in rural areas in Africa (Virtanen, 1991; Kaluli and Tiffen, 1992). Virtanen (1991) and Mvududu *et al.* (1993) in their separate studies on the role of NGOs on natural resource management in Zimbabwe, found that these organizations had been involved in afforestation and communal lands management since the mid 1980s; and their participation in mobilizing rural people to participate in tree planting and agroforestry had become more popular. Mung'ala *et al.* (1993) reported that in 1993, more than 75 NGOs were involved in rehabilitating degraded and gullied areas in Kenya through tree planting, agroforestry, terracing and rehabilitation of gullies in Kenya. Some of these organizations were (and are still) found in very remote areas

of the country which have received less attention from public sector extension services (Musyoka *et al.*, 1991), and were working closely with different local communities to solve natural resource management problems and other locally identified needs with an emphasis on training on use of indigenous natural resource management technologies.

There is abundant evidence that much of the early community based conservation work was instigated, undertaken and implemented by NGOs, both local and international. These efforts were based on the premise that community conservation was good for communities and good for conservation, and based on the emerging evidence that preservation and law enforcement alone were not solving conservation problems. Consequently, pressure was put on conservation authorities to embrace this more enabling approach. The role of NGOs as facilitators of the WMA implementation process is clearly stipulated under regulation number 77 of WMA regulations. Hulme and Murphree (2001) cite Africa Wildlife Foundation (AWF), World Wide for Nature (WWF) and International Union for conservation of Nature and Natural Resources (IUCN) as some of the NGOs that were on the forefront of the early community based conservation programs. Accordingly, NGOs like WWF, Frankfurt Zoological Society (FZS) and AWF have successfully facilitated the establishment of WMAs using this regulation (Nelson *et al.*, 2006).

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 The Study Area

3.1.1 Location

The study was carried out at Twatwatwa pilot WMA in Kilosa district. Twatwatwa pilot WMA consists of four villages namely Twatwatwa, Rudewa, Msowero and Mbwade. A map of Twatwatwa pilot WMA is shown on Fig. 2. The entire pilot WMA is within Twatwatwa village boundaries. Kilosa District is located in eastern central Tanzania, about 300 km west of Dar- es-Salaam. The District lies within latitudes 5°55' and 7°53' south and longitudes 36°30' and 37°30' east. It has a total surface area of 14 245 km².

3.1.2 Climate

The climate of Kilosa may be classified as semi arid type that is regulated by the seasonal movements of Intertropical Convergency Zone. This climate is bimodal. The short rain season is from November to January while the long rain season extends from March to May with a peak in April. The dry season is long, lasting for about six months from late May to October. Drought is experienced in some parts of the district such as Gairo and Mamboya divisions in the north. Twatwatwa pilot WMA receives between 1000 and 1400 mm of rainfall.

As a result of its topography, the district also shows variations in rainfall from one place to another and from year to year. The southern and central flood plains commonly receive 1000 to 1400 mm of annual rainfall while Gairo in the north

averages annually 800 to 1100 mm. The highland forest areas may receive up to 1600 mm of rainfall annually.

The mean annual temperature is estimated to be 25°C. However the mean maximum monthly temperature range from 27.3°C in November and 32°C in March with an annual average of 30°C, while the minimum monthly temperature range between 15°C and 20°C with an annual average of 19°C. The coolest period coincides with the dry period and is experienced from May to August.

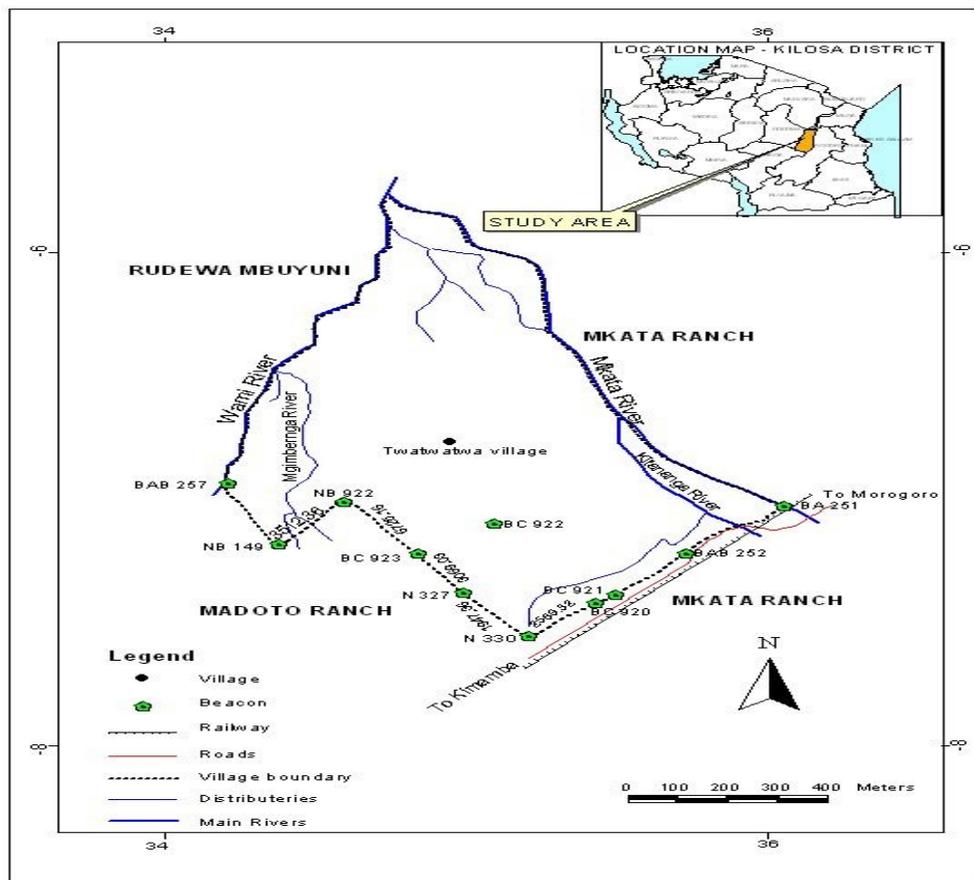


Figure 2: A map of Twatwatwa pilot WMA

3.1.3 Mammals present in Twatwatwa pilot WMA

The area is rich in a number of mammals. Mammals include elephants (*Loxodonta africana*), buffalos (*Syncerus caffer caffer*), eland (*Taurotragus oryx*), wildebeest (*Conochaetes taurinus*), lions (*Panthera leo*), leopard (*Panthera pardus*), impala (*Aepyceros melampus*), African hunting dogs (*Lycaon pictus*), warthogs (*Phacochoerus aethiopicus*), zebra (*Equus burchelli*), caracals (*Felis caracal*), yellow baboons (*Papio cynocephalus*), advaak (*Crycteropus affe*), porcupines (*Hystrix galleata*), striped jackals (*Canis adustus*), giraffe (*Giraffa camelopardus*), and the African hare (*Lepus capensis*). (Mungara, J. personal communication, 2007).

3.1.4 Birdlife

Several species of birds are found in the study area. These include cattle egret (*Bubulcus ibis*), great white egret (*Egreta alba*), grey heron (*Ardea cinerea*), Hammerkop (*Scopus umbreta*), Marabou stork (*Leptoptilos crumeniferus*), glossy ibis (*Plegadis fakinellus*), helmeted guinea fowl (*Numida meliagris*), crowned plover (*Venellus coranatus*), long crested- eagle (*Lophaetus occipitalis*), ring-necked dove (*Streptopelia capicola*), yellow bishop (*Euplectes capensis*), European swift (*Apus apus*), brown parrot (*Polcephalus meyeri*), malachite king fisher (*Carythomis cristata*), red-billed quelea (*Quelea quelea*), and the ground hornbill (*Bucorvus cafer*). (Mungara, J. personal communication 2007).

3.1.5 Vegetation

The area is dominated by *Acacia* woodland species with scattered *Dalbergia* species. Other species include tooth brush tree (*Salvadora persica*), tamarind (*Tamarindus indica*), baobab (*Adansonia digitata*), fan palm (*Hyphaene ventricosa*), wild date palm (*Phoenix reclinata*), sausage tree (*Kigelia Africana*), common wild fig (*Ficus thorningii*), silk tree (*Albizia anthelmintica*), wild teak (*Pterocarpus angolensis*), African red mahogany (*Khaya anthotheca*), bastard brand bush (*Grewia bicolor*), African teak (*Milcia excelsa*), desert date (*Balinites aegyptiaca*), orange frame vine (*Combretum fruticosum*), yellow barked sterculia (*Sterculia apendiculata*), pod mahogany (*Azelia quanzensis*), *Combretum* spp., *Commiphora* spp. and sycamore fig (*Ficus sycomorus*). (Mungara, J personal communication ,2007).

3.2 Study Design and Sampling Intensity

Cross-sectional research design was administered to the sampling unit (household). The design allows data to be collected at a single point in time and can be used for descriptive study as well as determination of relationships between variables. This design was necessary because of limited resources such as time and funds. The household was the basic analytical unit and the sample size was derived from Babbie (1990) and Creswell (1994) whereby a sample size of at least 5% of the total households is recommended. However, the sample size (n) was 10% for Twatwatwa, Rudewa, and Mbwade, while that of Msowero was 5% because of limited resources, including time and money. A total of 280 out of 4 300 households were interviewed (Table 1).

Table 1: Total number of households sampled from Twatwatwa pilot WMA

Village	Total number of households	Number of sampled households	Percent
Twatwatwa	280	28	10
Mbwade	220	22	10
Rudewa	800	80	10
Msowero	3 000	150	5
Total	4 300	280	

3.3 Sampling Procedure

Random sampling was employed based on each village's register. Households were assigned random numbers and selection of household was based on these random numbers. This gave every household an equal chance of being selected for interview. A household in this context refers to a group of people who eat from a common pot sharing the same dwelling and cultivate the same land (Katani, 1999). In the pastoralist communities, a household was derived from Mng'ong'o and Mwamfupe (2003) where it comprises a person or a group of persons, generally bound by ties of kinship, who may or may not live together under a single roof or within a single compound, but who share a community of life, in that they are answerable to the same head and share a common source of income and livelihood. A household was chosen because it is the ultimate unit of analysis and most appropriate unit to be measured (Blackwood and Lynch, 1994).

3.4 Data Collection

Primary data and secondary data were collected. Primary data were collected through household questionnaire and a checklist for focus group discussion as elaborated below.

3.4.1 Household survey method

Household questionnaire survey (Appendix 1) involved the use of both open ended and close ended questions. The household questionnaire was chosen because of the ease with which it can be used to accurately record information into discrete categories (Bernard *et al.*, 1988). Surveys are, however, sometimes susceptible to a lack of motivation by the local people and possible inaccuracy, as some respondents may give the answers they think the enumerator wishes to hear (Bleek, 1987). For this reason, focus group discussions (FGD) and key informants were used as supplements.

3.4.2 Focus group discussion

A checklist for the focus group discussions (Appendix 2) allowed the researcher to gain insight into the underlying beliefs and values of particular groups within the community under study. The information from the focus group is not intended to be representative of the whole community but of sections of the community which are deemed by the researcher to have particular relevance to the topic in question. Powell *et al.* (1996) define a focus group as a group of individuals selected and assembled by researchers to discuss and comment on, from personal experience, the topic that is the subject of the research. The recommended number of people per

group is usually six to ten (MacIntosh, 1981). In this study the composition of the focus group was heterogeneous consisting of men, females and youth. The focus group specifically included two elderly people who had lived in the area for a long time. A total of 32 individuals from Twatwatwa pilot WMA were involved in this exercise.

3.4.3 Key informants

A key informant is an individual who is accessible, willing to talk and has great depth of knowledge about issues in question. Key informants are not only members of the clientele, but are most often informed outsiders (Mettric, 1993).

In this study checklists were used to collect information from village leaders, district natural resources office staff and the Wildlife Division staff (specifically Game Officers). Information collected from village leaders (Appendix 3) was about the contribution made by conservation NGOs and government agencies towards establishment of the WMA. A checklist for the key informants at the district level (Appendix 4) provided information about their role in the establishment process of WMAs. The checklist for the key informants of the Wildlife Division (Appendix 5) provided information about the obstacles in WMA establishment and implementation.

3.4.4 Secondary data

Secondary data were collected through literature search, from journals, previous related studies, the library, CD ROM and internet.

3.5 Data Analysis

Data collected by questionnaire were coded and analyzed using Statistical Package for Social Science (SPSS). Descriptive statistics such as percentage and frequencies were used to present the results. Cross tabulation allowed determination of association between variables. Cross tabulation is both a powerful way of communicating and the commonest form of data presentation (Casey and Kumar, 1998). The Chi square test was used to determine the association between the respondents' involvement in WMA activities and their level of education.

3.6 Study Limitation

Language barrier was the first limitation encountered during this study. This problem was common among the pastoralist Maasai because some could not speak Kiswahili which is the national language. The reason for not being able to speak the national language is linked to some of them being illiterate. In such circumstances, a guide had to interpret the message from the researcher and vice versa. There was a possibility that the interpreter unintentionally missed some points.

Remembering certain events that occurred some years back was another limitation that was encountered during data collection. Since the implementation of the WMA stagnated some years ago, the problem of recall affected the responses.

Some of the respondents were not available at their residences when needed for interview. This was the case even if they had a prior appointment. This problem was common among the pastoralists largely because the study was carried out when water was a big problem, such that some respondents had to spend many hours at the

wells to supervise provision of water to their cattle. In some cases people had to be at the watering points from early in the morning till late in the evening. In such circumstances, the researcher had to follow the prospective respondents at the watering points. This problem was prominent at Mbwade.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Socio-economic Characteristics

Socio-economic and demographic characteristics provide relevant information showing the social and economic set up of the community under the study. This is particularly important in farming communities where social characteristics such as sex, age, marital status, education and income influence on resource access and ownership. Moreover, these are considered important because they sometimes have certain influence on development initiatives introduced in a given social setting (Howlet and Nagu, 1997).

4.1.2 Age

The age distribution in the study area is as presented in Table 2. The low percent (11.8%) in the category of 18-30 years could be attributed to the common phenomenon in which young men tend to migrate from rural areas to urban areas in search of employment opportunities. Moreover, better social services such as hospitals, water and electricity are more available in towns than in villages. This overstretches some public services such as transport and water. Similar observations were reported by Pereka and Kinabo (1997). The rural urban migration has resulted in overcrowding of towns and cities in most third world countries. On the other hand, low percentage in the category of above 60 years of age is a clear indication that few people in the study area and indeed country-wide survive to that age mainly because majority of the population live in abject poverty. The highest number of the respondents (51.1%) was in the age category of 31-45 years. This was probably due

to the fact that individuals in this age category are well established with both family and community responsibilities. This was particularly true in pastoral village.

Table 2: Age of respondents

Age (years)	Frequency	Percent
18 to 30	33	11.8
31 to 45	143	51.1
46 to 60	93	33.2
Above 60	11	3.9
Total	280	100.0

4.1.3 Sex

From the results, it is clear that the majority of the households were male-headed represented by 93.6% (Table 3). On the other hand, only 6.4% of the respondents were female-headed. From informal conversation with respondents it was clear that some females who had lost their husbands due to death had to move to their male relatives for support. This is very common in pastoralists where family ties are much stronger.

Table 3: Sex of respondents

Sex	Frequency	Percent
Male	262	93.6
Female	18	6.4
Total	280	100.0

4.1.4 Marital status

Results for marital status are summarized in Table 4. Findings from this study reflect a high marriage among respondents in the study area (78.6%). This is a common phenomenon in most rural areas in Tanzania. This scenario could be attributed to social responsibilities that require collective efforts between wife and husband. Most activities including hand-hoe cultivation are manually done. Both customs and cultural factors do also contribute to this high rate of marriage. Collective efforts between wife and husband therefore increase efficiency. On the other hand, the low percentage of single respondents is a reflection that was observed in the youthful age category of 18-30 years.

Table 4: Marital status of respondents

Marital status	Frequency	Percent
Single	30	10.7
Married	220	78.6
Widowed	23	8.2
Separated	7	2.5
Total	280	100.0

4.1.5 Education

The large percentage (67.9%) in Table 5 of primary education level among respondents is likely to be a product of the philosophy of Universal Primary

Education (UPE) and adult literacy campaigns that were introduced by the United Republic of Tanzania in the early 1970s. However, among the pastoralist Maasai, the philosophy was not well implemented because they were, as some still are, practicing nomadic type of life moving from one place to another in search of pasture and water for their livestock. Some of them have, however, decided to set up permanent residence after realizing that suitable land for grazing their animals was shrinking at an unprecedented rate because of increasing human population as well as more land being declared protected areas. Education, however, seems to have gained the importance it deserves among the Maasai. They have, for example, built both a primary school and a secondary school at Parakuyo, a trading centre of Twatwatwa village. Unlike in the past when pupils had to travel several kilometers to reach school, they can now easily go to school since both schools are located in their village. With time, illiteracy among the Maasai of Twatwatwa may become a thing of the past.

Table 5: Level of education of respondents

Level of education	Frequency	Percent
No formal education	55	19.6
Adult education	25	8.9
Primary school education	190	67.9
Secondary and high school	10	3.6
Total	280	100.0

The percent of respondents with secondary school being low (3.6%) is likely to be due to the fact that people who had received secondary school would not be interested in staying in villages where good social services and well paid jobs were scarce. Those who had stayed in villages were compelled to do so because of unavoidable social responsibilities. As an example, one of the respondents confided to this researcher that he had to abandon further studies after completing form four because his father had passed away and, therefore, being the eldest son, he was required by customary rules to remain with his mother to look after their cattle.

4.1.6 Occupation

The results indicate that 85.0% of the respondents were engaged in agriculture while 15.0% were livestock keepers (Table 6). This type of economy clearly reflects the views held in policy and research circles that about 90.0% of rural people in Tanzania depend mostly on agriculture for their livelihood (Howlet and Nagu, 1997). This calls therefore, for proper and sustainable land conservation and management or else the economy in question may collapse. The situation was worse because agriculture in the study area was the rain-fed one. In the years of drought, famine was a threat to the villagers. Respondents who keep livestock seasonally migrate as far as Bagamoyo, a distance of more than 200 km, to search for pasture and water for their herds of cattle. They nonetheless have to leave behind few milking cows to cater for the children's demand for milk.

Agriculture is the predominant activity in Msowero and Rudewa villages whereas Twatwatwa is exclusively a livestock keeper's village. Mbwade, on the other hand,

has a mixture of peasants and livestock keepers. The latter migrated to Mbwade in the aftermath of year 2000 fighting between Maasai and peasants in Rudewa to escape revenge from the peasants. Although all respondents among the Maasai indicated livestock keeping being their occupation, some also turned out to be engaged in rice cultivation as a cash crop. This was revealed to the researcher during informal conversation.

The two major crops grown in the study area are maize and rice. Rice is important to peasants not only as a food crop but as a cash crop as well. Maize on the other hand, serves mainly as foodstuff but owing to limited other sources of money needed to buy essential commodities, it is sometimes sold leaving peasants with little to eat. Rice cultivation is so popular at Msowero such that many people have been attracted to this village from all over the country. Consequently, the village has attained a small township status. This increase in human population is likely to result in people encroaching on nearby conserved area if the current human settlement trend continues unabated.

Table 6: Occupation of respondents

Occupation	Frequency	Percent
Peasant farmers	238	85.0
Livestock keepers	42	15.0
Total	280	100.0

4.1.7 Duration of stay in the village

The results which are presented in Table 7 suggest that among the respondents, particularly those who had responded to have lived in the village for up to 10 years, had migrated to the respective villages for different reasons. This was confirmed by members of the FGD at Msowero who said that several people had moved into their village after learning that rice was thriving very well in the area. Accordingly, some individuals had come from as far as Mwanza and Tabora following news that people were having bumper harvests of rice in the village. Even at Rudewa some individuals migrated to the area to work as laborers in sisal plantations and had since settled. The sisal industry collapsed following the discovery of synthetic substitutes in 1970s but as data collection was under way, some young people were seen cutting sisal leaves; an indication that new owners were trying to revamp the sisal plantations. Some respondents have thus lived in the district since 1960s when sisal production was at its peak.

The reasons given by those who had moved to Twatwatwa and Mbwade were different in that they escaped revenge attacks from peasants in the aftermath of the year 2000 fighting between Maasai and other peasants at Rudewa. A similar incident occurred during data collection at Mvumi village near Msowero. This time the fighting was triggered by cattle rustling between Maasai and Sukuma ethnic groups. The latter practice both livestock keeping as well as agriculture. The army had to intervene to prevent the situation from spiraling out of control.

Table 7: Duration of stay in the village by respondents

Duration (years)	Frequency	Percent
1 to 5	3	1.1
6 to 10	22	7.9
11 to 20	31	11.1
21 to 30	98	35.0
31 to 50	99	35.3
More than 50	27	9.6
Total	280	100.0

4.2 Involvement of Villagers in WMA Activities

The results show that 95.0% of the respondents were of the opinion that they were not involved in WMA activities, 3.6% responded that somehow they were involved and 1.4% (Table 8) responded that they were no longer involved. The high number (95.0%) responding not to be involved is a clear testimony that even when the pilot WMA was being conceived not all villagers were actively involved in WMA activities.

Table 8: Villagers involvement in WMA activities

Level of involvement	Frequency	Percent
Not involved	266	95.0
Somehow involved	10	3.6
No longer involved	4	1.4
Total	280	100.0

Chi square was used to test the association between respondents' involvement in pilot WMA activities and their level of education (Table 9). Results show that there was significant association between individuals' involvement in WMA activities and

their level of education i.e. $p < 0.001$, $df = 6$, $\chi^2 = 86.861$. The use of chi square test was based on the understanding that people with education are more likely to be involved in conservation activities than illiterate people.

Table 9: Association between involvement in WMA activities and level of education

Level of education	Involvement in WMA activities			Total	P value	df	X ²
	Not involved	Somehow involved	No longer involved				
No formal education	53	2	0	55	< 0.001	6	86.861
Adult education	22	3	0	25			
Primary school	185	4	1	190			
Secondary & high school	6	1	3	10			
Total	266	10	4	280			

During FGD at Twatwatwa some participants were of the opinion that their continued involvement was due to the fact that they prevented wild fire in the pilot WMA. Other participants were of the opinion that even charging fees for people collecting thatching grass and basket making leaves was a proper way of conserving the pilot WMA because if the area was freely accessible to members of the public then, *Hyphaene ventricosa* and *Phoenix reclinata* would go extinct in the no distant future. Both species have a very high value to Twatwatwa village. Any member of the public other than Twatwatwa villager intending to collect thatching grass/basket making leaves from the pilot WMA must pay a sum of TAS 5 000 to obtain a permit that allows him/her access to the pilot WMA. This has been a reliable source of

income for Twatwatwa village albeit a source of discontent among the other partner villages in Twatwatwa pilot WMA. Baskets made of materials from two species can be seen at Melera village waiting to be sold to tourists visiting the nearby Mikumi National Park.

Other participants in the FGD at Twatwatwa even contended that young men grazing cattle could apprehend poachers provided the poachers were not armed with firearms, an indication of their involvement in WMA activities. During FGD, it was revealed that respondents who had said that the villagers were no longer involved in WMA activities were actually referring to village game scouts who had to abandon the patrol missions after the villagers had failed to pay them allowances. Members of the FGD at Mbwade indicated that their single village game scout abandoned patrol because he could no longer work with other village scouts from Twatwatwa because they kept on talking in their vernacular language, something that left him isolated and bored. The ranger was from the Sagara ethnic group.

The decision by the village game scouts to abandon patrol missions, according to members of the FGD from both Twatwatwa and Mbwade, paved the way for the illegal hunters to operate freely. This allegation was, however, refuted by two key informants at the district who contended that people whom they had referred to, were actually legally doing so because the area is still treated as an open area by the District authorities. Other key informants were, however, unconvinced that there were no illegal hunters operating in the area. They argued that it was not possible for the staff from District Natural Resources Office to conduct regular patrols. This

explanation came with no surprise because many districts are understaffed and not adequately equipped to perform their duties (Hahn and Kaggi, 2001).

4.2.1 Awareness among respondents about Twatwatwa pilot WMA

The plausible explanation for the responses in which the highest number of respondents (36.8 %) in Table 10 responded not to have heard of the existence of the WMA is that, it was almost eight years since the pilot WMA was designated. For those villagers residing far away from Twatwatwa village, it was unlikely to recall something they have heard after such a long time. This was indeed the case in both Msowero and Rudewa villages. There is still a serious possibility that some of the respondents had not settled in the respective villages at that time. There was, however, a common understanding among all members of the FGD that indeed every village chairman convened a meeting to inform the villagers about WMA immediately after attending a seminar that had been organized by the Ministry of Natural Resource and Tourism. Some of the respondents are likely to have not attended the meeting on the day the concept was introduced by the village chairmen. Key informants confirmed that the concept of WMA had been introduced to their villagers but some village chairmen had lost the 2004 election and this had had a negative impact on the WMA.

Among the four village chairmen, it was only the Msowero chairman who was re-elected back to the office. As expected, he was the only one informed on the WMA concept. In one village, the village chairman asked the researcher to contact his predecessor who had left the office together with the documents relevant to the concept of WMA. As a matter of curiosity the researcher decided to contact the said

man who indeed was in possession of the documents relevant to the concept of WMA. In an informal conversation, the man attributed the failure to implement the WMA process to his removal from office, something which was not true. For the Twatwatwa villagers however, the presence of signboards all around the entire pilot WMA was a constant reminder that indeed the area had been designated as a pilot WMA.

Table 10: Year when respondent became aware of the pilot WMA

Year	Villages				Overall N=280
1999	Twatwatwa n=28 12 (4.2%)	Mbwade n=22 4 (1.4%)	Rudewa n=80 2 (0.7%)	Msowero n=150 0	18 (6.4%)
2000	2 (0.7%)	2 (0.7%)	2 (0.7%)	57 (20.4. %)	69 (24.6%)
2001	3 (1.1%)	0	0	0	3 (1.1%)
2003	2 (0.7%)	3 (1.1%)	2 (0.7%)	0	7 (2.5%)
2005	1 (0.4)	3 (1.1%)	1 (0.4%)	0	5 (1.8 %%)
Some years ago	0	2 (0.7%)	3 (1.1%)	0	5 (1.8. %)
A long time ago	2 (0.7%)	4(1.4%)	30(10.7%)	34 (12.1%)	70 (25%)
Not aware	0	4 (1.4%)	40 (14.3%)	59 (21%)	103 (36.8%)

4.2.2 Methods used to raise awareness of WMA among villagers

The responses for methods used to raise awareness among the respondents confirm that, a good number of the respondents (61.8%) had heard the concept through a village meeting while 1.1% of the respondents were told by other people (Table 11).

These responses suggest that village meetings were taken to be the most effective method of disseminating the information. Respondents who indicated to be not aware (37.1%) are likely to be those who had moved in the area after the pilot WMA activities had stagnated. Another possible explanation is that some of the villagers did not attend the village meetings on the days the idea of pilot WMA was introduced. It is also possible that some of the respondents had forgotten the existence of the pilot WMA because it is a long time since it stagnated. The low number that responded to have heard the concept from other people suggest that they probably had moved in the respective areas recently and might have heard people talking of requiring permits from Twatwatwa village in order to obtain thatching grass.

Table 11: Methods used to raise awareness of WMA among villagers

Method	Villages				Overall N=280
	Twatwatwa n=28	Mbwade n=22	Rudewa n=80	Msowero n=150	
Through village meeting	28 (7.9%)	20 (7.1%)	60 (21.4%)	68 (24.3%)	173 (61.8%)
Told by other people	0	2 (0.7%)	1 (0.4%)	0	3 (1.1%)
Not aware	0	0	19 (6.8%)	82 (29.3%)	104 (37.%)

4.2.3 Knowledge of processes involved in WMA implementation

Responses in respect of the knowledge of processes involved in WMA implementation indicate that 100.0% of the respondents were not informed on the processes involved in the implementation of WMA. The possible explanation for these results could be due to the fact that by the time this study was undertaken, the

implementation process had stagnated some years back making it difficult to remember something that had happened some years back. The conflict between peasants and pastoralists coupled with the pull out of Irish aid organization were mentioned as the reasons for stagnation of the WMA implementation process. Moreover, the process is long and extremely bureaucratic bearing in mind those villagers had only received limited education on WMA issues; remembering the processes was not possible. Key informants at the district level indicated that the CBO was already in place by the time the implementation process stagnated due to above mentioned reasons.

4.2.4 Opinion of villagers on best ways to involve them in WMA activities

Table 12 indicates that the highest number of respondents (56.8%) were, understandably of the opinion that education on WMA issues was of paramount importance. This is because ever since the pilot WMA was conceived there had not been enough efforts to educate villagers about WMA issues. A section of respondents (11.1%) had no opinion, probably a clear testimony that they were totally ignorant about the pilot WMA. Finally, 32.1% of the respondents indicated that they should have a separate WMA. These were mainly from Msowero village where there is a conserved natural forest and bearing in mind that their relationship with pastoralists of Twatwatwa was bad.

Table 12: Opinion of villagers on best ways to involve them in WMA activities

Opinion	Villages				Overall N=280
	Twatwatwa n=28	Mbwade n=22	Rudewa n=80	Msowero	
Education needed	n=150 20 (7.1%)	8 (3%)	50 (17.4%)	87 (31%)	159 (56.8%)
Do not know	8 (3%)	14 (5%)	3 (1%)	0	31 (11.1%)
Need separate WMA	0	0	27 (12.1%)	63 (20%)	90 (32.1%)

4.3 Capacity and Capability of Villagers to Implement WMA

The results indicate that the highest number of the respondents (97.1%) (Table 13) thought that they were not economically capable of implementing WMA because they had more important issues that required them to financially contribute. These included the construction of secondary schools at ward level which is the current government's drive to ensure that every child passing standard seven is enrolled in a secondary school. They therefore were not ready to engage in any other activity that may require them to financially contribute. Lack of expertise about WMA establishment was, however, the critical missing ingredient. Those who had responded that they didn't know were more likely to be honest because they didn't know how much the process could cost them. Needless to say, the role of establishing WMAs falls under the Wildlife Division.

Table 13: Capability and capacity of villagers to implement WMA

Capacity and capability to implement WMA	Frequency	Percent
Not capable	272	97.1
I don't know	8	2.9
Total	280	100.0

4.3.1 Annual income

The annual income was not easy to estimate. The researcher had, therefore, to estimate annual income based on how many bags of maize/rice in a good season each farmer could get. Knowing the average price of each bag, the annual income was estimated. The results indicate that a number of respondents (54.3%) earn an annual income of between TAS 150 000 and TAS 400 000, 21.8% of respondents earn below TAS 150 000, 18.8% earn between TAS. 401 000 and TAS. 1 000 000 and only 5.4% earn above TAS 1 000 000 (Table 14). Most of them had to sell their crops immediately after harvesting because they needed money to pay for other essential commodities. During informal conversation it was clear that the price of crops was at its lowest level when peasants were selling their crops. The price of cereals increased later in the season, such that they could not afford to buy them. In severe shortages they survived on government's subsidized maize. This situation is akin to a vicious cycle of poverty.

In addition to low level of income, qualified human resource was a constraint to carrying out long and cumbersome processes such as land use plans and environmental impact assessment. Being incapable and unable to implement WMA on the part of villagers therefore was another reason for the failure of the WMA to take off. Thus villagers had no required human resources to carry out the necessary processes required to carry out WMA implementation.

Table 14: Annual income of respondents

Annual income (TAS)	Frequency	Percent
Below 150 000	61	21.8
Between 150 000 and 400 000	152	54.3
Between 401 000 and 1 000 000	52	18.6
Above 1 000 000	15	5.3
Total	280	100.0

Respondents attribute their low level of income to several factors including using hand hoe for cultivation which limit the acreage an individual farmer can cultivate in a season, and lack of agricultural inputs such as fertilizers and pesticides. Wild animals were mentioned to cause substantial crop loss. To contain wild animals, some of them indicated that they seasonally had to shift their residence to farms to ward off wild animals. Crop loss caused by wild animals appears to be an obstacle in WMA establishment since WMA can not be an alternative land use for this area.

Lack of extension services was also responsible for the low harvest which in turn affects their annual income. Some villagers were so poor such that in one village the village chairman uses a grass thatched mud hut as an office. These results are similar to that reported by Glewwe (1990) who indicated that the vast majority of the poor live in rural areas and about three quarters depend on agriculture for their daily existence.

Livestock keepers, on the other hand, were economically well off because they were assured of income throughout the year. Even when there was drought they moved with their herds of cattle to search for pasture and water. Having decided to permanently settle at Twatwatwa, they came back during the rain season. They earned their income through sales of milk, meat and live animals. The movement of stocks from one place to another is, however, costly and is not sustainable in this era of climate change.

During FGD at Twatwatwa it became apparent that indeed some livestock keepers were engaged in rice cultivation on hired plots from peasants. Their economic powers enabled them to hire tractors and therefore are able to cultivate many acres which in turn give them additional income. Agriculture is, however, not considered their occupation and probably this explains why none of them mentioned it to be their occupation. Indeed pastoralists consider agriculture to be an inferior occupation. Although livestock keepers complained of receiving little help from local livestock officers, they still could buy veterinary drugs from local livestock market where traders from Morogoro town came with different drugs.

The livestock market is located at Parakuyo village. The explanation for their livestock officer failing to visit them regularly is probably due to lack of transport. Lack of extension services was also confirmed by the village key informants. Under certain circumstances, they even treated their animals with medicinal plants a tradition they have practiced for centuries before the advent of conventional

medicine. The use of indigenous knowledge among the Maasai, is not confined to treating livestock diseases but treatment of human diseases as well.

4.3.2 Land use plans

Results indicate that all the respondents thought that their villages had no land use plans. One key informant at district level however, confided to the researcher that among the member villages only Twatwatwa had a land use plan. The fact that not a single respondent was aware that Twatwatwa had a land use plan is an indication that WMA implementation process is still not clear to respondents. Furthermore, these results suggest that villagers can not accomplish this process without external help. It further confirms that people were not involved in the WMA establishment process. Key informants indicated that the entire pilot WMA was within the borders of Twatwatwa village and that the decision to include other villages was based on the fact that it shared borders with other participating villages and, therefore, had to assist in preventing poachers from entering the pilot WMA.

4.4 Benefits from Pilot WMA

The results (Table 15) indicate that 71.0% obtained nothing from pilot WMA, 2.5% obtained basket making leaves/thatching grass, while 7.9% obtained medicinal plants. Other products accessed included building poles 28.6.0%, 2.0% honey, and 1.0% fruits. The latter two were considered less important because they were mainly collected by children, while the former could be obtained from other areas outside pilot WMA. Surprisingly, there was not a single respondent who indicated to be involved in hunting game meat. This is probably because first, the Maasai

traditionally do not eat game meat, and, secondly, because poaching is a sensitive issue and, therefore, no one was ready to confess it among the other ethnic groups. During informal conversation, some peasants from Mbwade village said that they could go and fish in the pilot WMA during rain season when the Maasai were not likely to graze their animals far away from their homesteads.

Table 15: Benefits from pilot WMA

Product	Villages				Overall N=280
	Twatwatwa n=28	Mbwade n=22	Rudewa n= 80	Msowero 150	
None	0	0	52 (18.6%)	148 (52.3%)	200 (71.0%)
Basket making leaves/ thatching material	2 (0.7%)	4 (1.4%)	0	1 (0.4%)	7 (2.5%)
Building poles	22 (7.9%)	28 (10%)	28 (10%)	2 (0.7%)	80 (28.6%)
Medicinal plants	14 (5%)	6 (2%)	2 (0.7%)	0	22 (7.9%)
Honey	3 (1%)	2 (0.7%)	0	0	5 (2.0%)
Fruits	2 (0.7%)	1 (0.4%)	0	0	3 (1.0%)

*The total responses for frequency (317) and percentage (113.0%) are greater than 280 and 100% respectively owing to multiple responses.

Individuals who said that they obtained nothing from the pilot WMA (71.0%) are an indication that many respondents are less dependent on the pilot WMA. For Msowero and Rudewa villagers, the reason given for not being dependent on the pilot WMA is that the long distance between their village and the pilot WMA was an impediment. Furthermore, they argued that they had their own natural forests where they could obtain forest products. The only product which was exclusively available in the pilot WMA was *Phoenix reclinata* and *Hyphaene ventricosa* and therefore only those individuals who had business interest related to access of these species

could go to Twatwatwa. These arguments were advanced at the two villages during FGD. They further indicated that they were no longer using poles to build their houses and instead were either using baked bricks or mud bricks for house construction.

For individuals that were affected by the 2000 fighting between pastoralists and peasants, some were given iron sheets for roofing their houses after the original ones were set ablaze by the Maasai; making them even less dependent on the pilot WMA for thatching grass. The animosity between the peasants and pastoralists further makes the peasants more unlikely dependent on the pilot WMA. The fact that respondents from Msowero (152) and Rudewa (48) outnumbered the rest further explains why there were such a high number of respondents saying that they obtained nothing from the pilot WMA.

Building poles as a product was mentioned by only 28.6.0%; an indication that it is only a small percent of the respondents that still use this product for house construction. For respondents at Twatwatwa failing to mention it is possible that respondents tend to remember products they collect regularly. Another explanation is that some of the respondents have houses constructed of baked bricks and, therefore, could not easily remember something they no longer use.

Medicinal plants were mentioned by 7.9% as being important in primary health and this is true particularly in rural areas where health care is often in short supply. Elderly people, among the FGD held them in high esteem because, according to

them, these medicines could even treat diseases where conventional medicines had failed. These findings agree with several other researchers. FAO (1995) for example, reported that local communities have developed sophisticated knowledge systems about the use of a vast variety of plants for medicinal purposes. Chandraskan (1998) reported that about 75% of the world population was dependent on traditional medicine. Marshal (1998) reported that in Africa, reliance on such medicines is due to high costs of conventional medicines and the inaccessibility of modern health care facilities and also traditional medicine is often deemed as more appropriate method of treatment. Mahunnah (1993) reported that in Tanzania medicinal trees and herbs are the main source of medicine for the traditional healers and about 80% of rural people depend on them.

Maliehe (1992) reported that in Malawi, sales of traditional medicines are one of the main commercial activities in urban areas. Similar observation was echoed by one elderly Maasai during FGD who said that some of them earned a living through sale of traditional medicine and that some of the traditional medicines sold in Morogoro town were from the pilot WMA. Hines and Eckerman (1993) reported that Maasai pastoralists have used woody plants and other aromatic plant parts as herbs to cure illness and diseases since pre-historic times. They also treat their children using different types of plants that have shown to have fungicidal, antiprotozoal, bactericidal and antiviral properties.

Respondents who indicated to collect basket making leaves/thatching grass (2.5%) from pilot WMA were mainly from Twatwatwa probably because they obtained

them free of charge while other villagers had to pay a fee. During FGD, members from Twatwatwa village justified their action of charging fees to members of other partner villages on the fact that their clients included other people who hail from villages that were not part of the pilot WMA. This made the task of identifying the right member of a partner village a difficult one. Moreover, the pilot WMA according to them was entirely on their village land and, therefore, it was up to them to decide on how to run it. Although this product was attracting many people, Twatwatwa village could not afford to pay their village scouts and, consequently, the village game scouts abandoned the patrol exercise.

Honey, was mentioned by only 2.0% of the respondents as a product from pilot WMA because according to members of the FGD at different villages was regarded as a product that is usually collected by children who are either grazing cattle or collecting firewood. It is common knowledge, however, that honey provides an important source of non proteinous insect food product. It is nutritionally valuable especially due to its high energy content. According to Krell (1996), honey is normally consumed in its unprocessed state in combs as medicine and has been found to be important for Sandawe people of Tanzania. It is also used as life-saving food in times of famine or natural disasters because of its high energy content.

Fruits as a product were mentioned by only 1.0% of the respondents largely because, like honey, it is also usually collected by children. In many parts of the world, wild fruits are an important source of food for many rural communities. Adults tend to ignore the use of wild fruits while their children fight for their collection and use.

This probably explains why such small percentage of the respondents could remember it during the interviews. Fruits contain vital nutrients and essential vitamins which are important, especially for growing children who are prone to malnutrition. This fact is supported by Maghembe *et al.* (1998), whose analysis of fruits revealed that *Strychnos cocculoides*, *Palinari curatellifolia* and *Azanza gaerckeana* contained 30% fat and about 45% crude fibers and carbohydrates.

Another important product that was neither mentioned by respondents nor the FGD and which is available in the pilot WMA is timber. This was revealed by key informants at the district level who indicated that following the ban on export of logs, all logging activities had stopped in the area.

4.5 Damages Caused by Wild Animals to Villagers in Twatwatwa Pilot WMA

The results indicate that 85.4. % of the respondents indicated that their crops were destroyed by wild animals (Table16). During FGD a number of animals were mentioned to be the most problematic. These included elephants (*Loxodonta africana*), yellow baboons (*Papio cynocephalus cynocephalus*) and *Quelea quelea*. Elephants were mentioned to be the most destructive because once they invaded paddy farms, owners were helpless and in such cases even the help from district headquarters arrived when enough damage had already been done. Elephants were, however, not coming to paddy farms every season. They only destroyed crops when there was severe drought and they usually destroyed crops on their way to Rubeho Mountains where there are permanent water streams.

For other problem animals, some of the peasants have to seasonally migrate to their farms to chase away wild animals intending to destroy their farms. Key informants at the district level confirmed that sometimes they were slow to respond to peasants' requests because of lack of funds. Lack of reliable vehicles was cited as another bottleneck in carrying out their duties. The Wildlife Division headquarters sometimes assist the District to carry out patrol missions by temporary sending vehicles, rangers, and funds.

Table 16: Damages incurred by villagers for being near pilot WMA

Type of damage	Frequency	Percent
Livestock/human injury/death	30	10.7
Crop destruction by wildlife	239	85.4
I don't know	11	3.9
Total	280	100.0

Livestock/human injury/death was another damage that was mentioned to be caused by wild animals. The low percentage of 10.7 % (Table 16) reflects the number of respondents who own livestock. Predators that were mentioned by the respondents included lions (*Panthera leo*), leopards (*Panthera pardus* and hyena (*Crocota crocuta*). The latter two attack mostly small animals such as goats and sheep.

During FGD, members pointed out that lion attacks were occasional, suggesting that only those weak/old were the ones inflicting losses to pastoralists. Otherwise healthy lions were likely to hunt other prey in the wild. Another possible explanation is that

attacks by lions occurred when herbivores had migrated to search for new sources of pasture and water. Unlike the peasants some of the pastoralists legally own firearms to deal with wild animals. Owning firearms has often given them advantage over the peasants in their fightings.

Human injury and human death was associated with crocodiles (*Crocodylus niloticus*) at Mkata and Wami Rivers, both of which are crocodile infested. At the time of data collection, two people from Twatwawa village had been killed by crocodiles while a third one had to be rescued by his courageous colleagues and had to be hospitalized for six months. Crocodile attacks were mentioned by the Maasai to be the most terrifying experience because for them fighting a lion even with traditional weapons was a very simple exercise.

Damages caused by wildlife in all the study villages were not compensated by the government because the government of Tanzania does not have a policy of compensating victims of wildlife although it is the owner of these animals. Failure by the government to compensate villagers makes them angry as was the case among the members of FGD, especially in those villages whose economy depended on crop farming. This finding agrees with that of Gibson and Marks (1995) who asserts that while paying the costs for conservation in the form of damaged crops and even human lives, rural communities receive few legal benefits from wildlife. As a result such policies provide few incentives for the sustainable use of wild animals. Rural and urban residents consistently choose to kill wildlife despite the restrictive legal codes.

4.6 Roles of Government/NGOs Towards Implementation of the Pilot WMA

Respondents to this question were village chairmen who are custodians of all village finances and therefore were in a better position to tell what assistance their village had received from government/NGOs. Both Twatwatwa and Mbwade villages had their village chairmen and village game scouts trained on WMA issues. The number of trained village game scouts from Twatwatwa was four while only one village game scout from Mbwade went for training. There were also village chairmen training for both Rudewa and Msowero. Not a single village scout was trained in both villages. Training was sponsored and conducted by the government through the Wildlife Division. Reasons for this gap between the four villages are probably due to the fact that Mbwade, Rudewa, and Msowero had to play a supportive role. One of the key informants at the district level confided to the researcher that his trips to Twatwatwa village to conduct seminars were financed by Irish Aid, an NGO that was operating in the village. Similar financial assistance was extended to some Twatwatwa villagers who went to Kenya on study tour about community based conservation as confirmed by Twatwatwa village chairman. The involvement of this development agency in conservation efforts is not unusual because Hulme and Murphree (2001) reported the involvement of CARE in the conservation of mountain gorillas in the Virunga Mountain National Park.

The key informants at the district were of the opinion that the withdrawal of Irish Aid NGO was the final blow to their efforts in carrying on with the implementation of Twatwatwa WMA because its withdrawal meant that wildlife experts could no longer manage to go to Twatwatwa village. The key informants at the Wildlife

Division however, think that the fighting between peasants and pastoralists was the reason for the implementation process to stall. The implementation of WMAs in Tanzania has had inputs from NGOs (Nelson *et al.*, 2006). Examples include DFID at Idodi Pawaga WMA and WWF at Ngarambe Tapika WMA.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The implementation process of Twatwatwa pilot WMA stagnated before completion due to a number of constraints such as low level of income, lack of educated human resources to carry out required processes in WMA implementation. The concept was implemented during the initial stages such that the area has eighteen sign boards for example, indicating a conserved area. The sign boards prohibit people from starting fire in the area, prohibit people to hunt in the area and above all prohibit people from littering the area.

The involvement of local communities in WMA activities was only during the first stage of the implementation of the pilot WMA where village chairmen introduced the concept to the villagers after receiving the concept from wildlife experts in a seminar that was organized by the Wildlife Division in Dar es Salaam. Although the involvement of local communities in the pilot WMA has officially stalled, there is still an informal involvement of Twatwatwa villagers in protecting resources in the area. Villagers had also been involved when the pilot WMA boundaries were being set up by putting signboards along the boundaries.

Village game scouts had been trained in two of the four participating villages. These had to abandon patrol missions after the village had failed to pay them allowances. The village scout from Mbwade was the first to abandon the patrol mission because

of cultural differences. At the time the implementation process stalled, the pilot WMA had a CBO in place.

Local communities in the study area have enough resources in terms of wildlife resources but lack trained personnel and financial power to carry out the procedures required before a pilot WMA is gazzetted. They had well trained village game scouts who proved efficient in patrolling the area before abandoning it after the village authority had failed to reward them. Among the participating villages, Twatwatwa appear to be economically well off. This, coupled with their culture of not eating game meat makes them excellent candidates in community based conservation.

The benefits gained by the participating villages were mostly appreciated at Twatwatwa where at least revenues are generated through sales of both *Hyphaene ventricosa* and *Phoenix reclinata* leaves. The remaining village members gain nothing by having pilot WMA near their area. This leads them to dislike the area because although wild animals destroy their crops they are not compensated. Even Twatwatwa villagers are not happy with the idea that their pilot WMA is still run as an open area where rich people go and hunt after they had paid hunting fees at the District Natural Resources Office. Suffice to say that costs incurred by local communities outweigh the benefits.

The contribution that was made by the Wildlife Division/ Irish Aid was too little to accomplish all the procedures required in the implementation process of WMA. The procedures are (as listed earlier) long and bureaucratic. The withdrawal of Irish Aid,

though a development agency, was a serious setback to the implementation of Twatwatwa WMA since it was involved in early processes pertaining to WMA implementation. Data collection was conducted when the agency had left the area, thus it was not possible to establish the reason for their departure.

The fighting between pastoralists and peasants appear to have also affected the implementation process. It is, however, now calm although the conflict may erupt, such that the only missing critical factor is the financial ability to continue with the implementation process. The future of Twatwatwa pilot WMA remains bleak unless the Government intervenes and assists in the implementation process. Opinions towards implementation of WMA were divided among the villagers favoring education on WMA issues followed by implementation while a small percent favoured formation of a separate WMA in adjacent villages.

5.2 Recommendations

Based on findings from this study a number of recommendations can be made:

- 1) The government must assist the villagers to permanently resolve the conflict between pastoralists and peasants.
- 2) The villagers should be educated on WMA issues so that they are fully involved at every stage of WMA implementation.
- 3) The government must assist Twatwatwa pilot WMA to get conservation NGOs that will financially help villagers to execute processes that a pilot WMA must go through before it is gazzetted.
- 4) The government need to rethink about the procedures required before a pilot

WMA is gazzetted. The current procedures are long and extremely bureaucratic.

5) It is recommended that village game scouts be rewarded for patrolling activities. The village can use revenue generated from sales of *Hyphaene ventricosa* and *Phoenix reclinata* leaves to reward them as other processes await the Wildlife Division to assist in the WMA implementation process.

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26/8/2007.

APPENDICES

Appendix 1: Household Questionnaire for Twatwatwa pilot WMA

A. Particulars

1. Respondent number
2. Date of interview
3. Name of village.....
4. District

B. General information of respondent

- 1.0 Age of respondent
 - i) 18 to 30 years..... ()
 - ii) 31 to 45 years.....()
 - iii) 46 to 60 years.....()
 - iv) Above 60 years..... ()
- 2.0 Gender
 - i) Male..... ()
 - ii) Female..... ()
- 3.0 Marital status
 - i) Single..... ()
 - ii) Married..... ()
 - iii) Widowed..... ()
 - iv) Separated..... ()
- 4.0 Education level.....()
 - i) No formal education..... ()
 - ii) Adult education..... ()

- iii) Primary school level.....()
- iv) Secondary and high school.....()
- v) Post secondary school certificate()
- vi) Diploma.....()
- vii) Degree.....()

5.0 Duration of stay in the village

- i) 1 to 5 years..... ()
- ii) 6 to 10 years.....()
- iii) 11 to 20 years..... ()
- iv) 21 to 30 years.....()
- v) 31 to 50 years.....()
- vi) More than 50 years.....()

6.0 Occupation

- i) Agriculture..... ()
- ii) Livestock keeping..... ()
- iii) Business..... ()
- iv) Employment (Government/Private..... ()
- v) Politician..... ()

C. Involvement of local communities in pilot WMA activities

- 1 When did you become aware of the pilot WMA?
- 2 How did you become aware of the pilot WMA?
- 3 How are the villagers involved in WMA activities?
- 4 Do you have pilot WMA leaders? Yes/No

5 If the answer in (4) above is yes, were they elected?

6 If the answer in (5) is no, why?

7 Were the leaders elected? Yes/No

8 Were you involved in their election?

9 How best do you think village community could participate in WMA activities?

.....
.....
.....
.....

D. Capacity and ability of local communities

10 Do you know all the processes involved before pilot WMA is gazetted? Yes/No

11 If the answer in (10) is yes, mention them

.....
.....
.....
.....

12 Which of the processes that have been accomplished?

.....
.....
.....

13 Do you have a village land use plan? Yes/No

14 If yes, who did the land planning?

15 Was the environmental impact assessment carried out? Yes/No

16 Do you think the villagers are economically capable of accomplishing all the procedures required before the pilot WMA is gazetted?

17 What is your annual income?

Below 150,000 Tsh

Between 150,000 and 400,000 Tsh

Between 401,000 and 1,000,000 Tsh

Above 1,000,000 Tsh

E. Benefits from pilot WMA

18 Which products do you obtain from the pilot WMA?

.....
.....
.....
.....

19 What other benefits does pilot WMA provide to your household/community?

.....
.....
.....
.....

20 Who administers the benefits?

.....
.....

.....
.....

21 Do benefits differ from one village to another? Yes/No

If yes, please explain

.....
.....
.....
.....

22 How do you access the benefits from pilot WMA?

.....
.....
.....
.....

23 Has the access to products changed since the area became pilot WMA? Yes/ No

24 How has the access to wildlife resource been affected since becoming a pilot WMA?

.....
.....
.....

F. Damages incurred because of pilot WMA activities

25 Have you ever incurred monetary costs related to pilot WMA activities? Yes /No

26 If the answer in (25) is yes mention them

.....
.....
.....

27 Which other damages incurred by household/ community due to pilot WMA?

.....
.....
.....
.....

Appendix 2: Checklist for focus group discussion

Topics for focus group

- i. Involvement of local communities in implementation of WMA activities
- ii. Capacity and capability of local community to implement WMA
- iii. Benefits and damages incurred by having a pilot WMA

Appendix 3: Checklist for village leaders

1.0 Village chairmen

- i. Main natural resources found in the pilot WMA.
- ii. Access to resources found in the pilot WMA.
- iii. Main use of the natural resources that are available.
- iv. Does culture play an important role in the management of wildlife in the study area? [specify the important cultures].
- v. Existing local institutions for regulating resources uses and conflicts management.
- vi. Problems faced in regulating access.
- vii. Are there any external interferences.
- viii. Are boundaries to the pilot WMA known to all the members.
- ix. Benefit from the pilot WMA resources and their distribution.
- x. Incentive and disincentives for people participation in management of
 - a. natural resources.
- xi. Main problems faced in administration.
- xii. How could perceived problems be rectified.
- xiii. Experience in the implementation of the pilot WMA process?
- xiv. What are your future plans?
- xv. Contribution received from conservation NGO/government toward WMA
 - i. Implementation.

Appendix 4:**2. Checklist for District Natural Resources Office**

- i. Main natural resources available.
- ii. Main uses of available natural resources.
- iii. Existing institutions for regulating resources use and conflicts management in the study area.
- iv. Natural resources use conflicts and underlying causes.
- v. Extension services provided.
- vi. Are there any perceived external interferences to the management? What are these interferences and their magnitude?
- vii. How do you rate the commitment of the local community in the implementation of the pilot WMA regulations.
- viii. Does culture play an important role in the management of wildlife in the study area? [specify the important cultures].
- ix. Incentives and disincentives for peoples' participation in wildlife management
- x. Main problems faced in administration.
- xi. How much can the establishment of WMA cost?

Appendix 5:**3. Checklist for Wildlife Division staff**

- i. What have been the challenges during the implementation process?
- ii. Future plans for pilot WMA yet to be gazzeted