

MINISTRY OF NATURAL RESOURCES AND
TOURISM
WILDLIFE DIVISION

**BASELINE SURVEY OF THE EASTERN PILOT WILDLIFE
MANAGEMENT AREAS**

FINAL REPORT

VOLUME IV: UKUTU-JUKUMU

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Executive Summary

0.1 INTRODUCTION

The main objective of this study was to facilitate the collection, analysis and compilation of baseline information from 16 pilot WMAs. This information is intended to be the basis for the development of Monitoring Indicators and Monitoring Plans during the implementation of the Ukutu-JUKUMU proposed pilot WMA.

0.2 METHODOLOGY

Both primary and secondary data were collected from all villages surrounding the three WMAs.

Socio-Economic Data

- Secondary data was collected through extensive literature reviews from documents obtained from different sources, including GTZ, WWF, IRA, DFID, MNRT and WD. There were also consultations with key and primary stakeholders in the above listed institutions, councilors, and other key players. In the study areas we also visited the JUKUMU Society offices at Dutumi and District Wildlife Offices in Morogoro. We also searched for additional information from the Internet.
- Primary data was collected from all the villages surrounding the proposed pilot WMA, except for one village which was not visited due to its inaccessibility. Due to fears of a threatening on-set of the rains that would make many of the villages in the Ukutu-Jukumu inaccessible, villages were grouped into fours or fives according to their proximity. Within the villages discussions and/or meetings were conducted with village government leaders, focused groups differentiated by age and gender, and a few of the curious general public.

Data Collection Instruments used included:

- PRAs techniques using focused group discussions, wealth ranking, key informants and individual villagers interviews. A checklist developed in Dar es Salaam was used to gather information from the respondents.
- A household questionnaire was also administered to 5 villages. The selection of villages for household interviews was done randomly, while that of the respondent households was stratified in terms of main occupation (agriculture or livestock keeping), gender, age and migration status. From each stratum villagers were selected randomly making a total sample of 30 households per village.

- Photographs were taken where appropriate. For example several pictures were taken from areas with severe overgrazing and/or deforestation resulting from shifting cultivation.
- Physical observation of the study area was also done to assess levels of WMA encroachments by cultivators and land degradation through burning and shifting cultivation.

Data weaknesses and limitation:

- The data collected from the villages depended very much on the respondents' recall capability. Most of the villages seem not to have proper record keeping systems that may affect the reliability of the data. However, secondary data from the GTZ and the Ministry of Natural Resources and Tourism helped to reduce the weakness in reliability.

Ecological Data

Data collection involved literature review, field reconnaissance surveys, and informal discussions with selected individuals knowledgeable about the area, and public meetings with village government leaders.

- The scanty secondary data provided supplementary information to that contained in this report. Various reports were reviewed specifically to collate information and establish ecological status of the area to cover:
 - the current ecological status of the area
 - trends and use of wildlife (consumptive and non consumptive uses)
 - the status of vegetation communities and an assessment of the suitability of the habitats for wildlife
 - the current status and trends in water availability for wildlife
 - an overview of wildlife movements
 - status, trends and use of fisheries, forest and bee keeping resources and other biological resources
 - human-wildlife conflicts and natural resource use conflicts in general.

Primary data collection was done through:

- rapid field reconnaissance surveys on the proposed WMA. In the field visits the ecologist was accompanied by the District Game Officer and/or a local resident who knew the area well. The field visit gave room for site discussions and exchange of ideas on the observations made. The purpose of the field reconnaissance was to identify key ecological issues that require immediate action and follow up during the first three years of the pilot project. Due to limited time and resources, field work was limited to road transects around the proposed WMA. Driving along selected roads provided an overview of the ecological status of the area and helped to verify some information provided by villagers, as well as verify information collected from secondary sources.
- interviews with village government leaders and village game scouts selected as representative samples of various communities in the villages. Village government leaders were selected for the interview

because they are elected by communities to represent them in making important decisions. All members of the village government were invited to participate in the interviews, believing that the information provided was representative of community views. Village game scouts were selected because they are directly dealing with natural resources protection in the area, so it is believed that they have a better view of the problems existing in the field than other members of the community.

- a checklist of ecological information relevant to the proposed WMA was administered, together with social and economic aspect questions, to the village leaders of villages surrounding the proposed pilot WMA. Open-ended questions were posed to the village leaders, and each was given the opportunity to respond while others were allowed to give their comments on the response given. The consensus of the majority was recorded as the right response.
- special informants who seemed to understand the area better and had interest in conservation were selected from the local communities and interviewed. They provided ecological information that either verified information collected from secondary sources, or provided information that was unavailable.
- Maps for the area were obtained from Morogoro Rural Districts' Lands Development and Natural Resources Offices. In most cases there were no extra copies, the maps had to be redrawn or taken as blueprints.
- GIS work was done at the Tanzania Wildlife Research Institute. The work involved digitizing specific thematic maps and overlaying selected information to suit the purpose of this study. The package used in this analysis is ArcView. Analysis was done at a limited scale due to limited financial resources.

0.3 SURVEY FINDINGS

Sociological Aspects

Demographic characteristics

- Population change in the Ukutu-JUKUMU WMA is gradual. Growth ranges between 16% - 26% for Bwakila and Kisaki wards, respectively. In-migration in search of agricultural potentials, especially cultivation of sesame, has been the main population growth factor.

Natural resource use

- Fuelwood is the most used resource in the proposed pilot WMA, followed by charcoal, building poles, thatch grass and medicinal plants. Wildlife is widely recognized as an important resource in all the villages surrounding the proposed WMA; the influence of the work by JUKUMU is evident here.

Institutional Set-Up

- The standard village government structure comprising three main committees (Planning and Finance; Peace and Security, and Social Services Committees) prevails in all the villages visited. Under these

committees are various specialized sub-committees. The Natural Resources Sub-Committees operate under the Planning and Finance Committees.

Governance

Infancy or lack of opposition political parties has led to a situation where there is no watchdog to forestall or criticize village government excesses or abuse of power.

There are very few active CBO in the area. The few that exist include JUKUMU Society (Ukutu - Conservation). Others belong to religious missions dealing with the provision of social services such as education and health care.

Understanding the concept of WMA

This was measured by calculating the percentage of people mentioning all the three attributes of the concept, i.e. participation, benefit sharing, and resource conservation in defining the concept. Results show that perception is high (68%) in Ukutu-JUKUMU.

Level of development of WMA

Ukutu-JUKUMU is well advanced. The work of JUKUMU Society puts communities surrounding this proposed WMA in a better position to form an Authorised Association. The proposed WMA (750 sq.km.) has been surveyed and mapped.

Economic Aspects

Land use

The land use pattern is characterized by residential, agriculture, livestock and conservation. A few villages in the Ukutu-JUKUMU proposed WMA have set aside land for later use and some have areas set for burial purposes. Attempts to quantify areas under different uses were difficult because most of the villages do not have land use and general management plan.

At the household level farmers were able to mention the number of plots and crops grown but it was very difficult for them to provide acreage under each crop. This is partly because farmers practice intercropping rather than pure stands. To have such data it needs a separate detailed study, which starts with awareness raising on the importance of record keeping for any economic activity.

In many villages land for grain farming other than rice is plenty. Many people still practice shifting cultivation. However, land for rice farming and gardening is not adequate in all villages visited. The two

crops are important for food security and cash income. Following the collapse of cotton marketing in Ukutu-JUKUMU, rice has emerged as a major cash crop in the area.

The reason for limited land for rice production in the villages surrounding the proposed Ukutu-JUKUMU WMA is both due to limited irrigated land, population pressure and unequal distribution. In the past 30 years, there has been an influx of people from other parts of the country looking for pastures and agricultural land around the proposed WMA.

Inadequate land for pastures is facing the livestock sector in the area. Insufficient grazing areas and water for livestock is common for many villages and has been the major source of conflict between farmers and livestock keepers. But also poor governance by VG in managing and allocating resources to different users has contributed to these conflicts.

Village economic status

People in Ukutu are principally agriculturalists. 87% of the population are either pure farmers or mixed farmers. Other economic activities include livestock keeping, mainly by the Maasai, Sukuma and Barbaig. There is also petty business especially during dry season, including shops, transport services, and milling machines. Fishing and beekeeping are operated on subsistence levels.

Agricultural farming technology

Farming in Ukutu is mainly done using the hand hoe. Input use is very low or non-existent. Farming is mainly rain fed, although some irrigation is practiced too.

Overall village economy

The major economic sources existing in the area include agriculture, livestock keeping, petty trade and fishing.

Generally, villages' economy is low due to different reasons, including poor farming technology, low input use and poor marketing. Income from other sources such as employment is almost non-existent. Although households also considerably benefit from natural resources extraction, such information is very difficult to quantify because they are used mainly at subsistence level. On the other hand, poor record keeping on income and expenditure by households makes the assessment of this information rather difficult.

Household agricultural production, yield and trends

Production levels at households for the past five years were difficult to determine. This is partly because, except for rice and maize, most of the crops are produced at subsistence level. Also farmers do not keep records of production levels, so it is difficult to memorize for the past five years. The only information

available is for current season 2002/2003 and to a large extent it is only applicable to the crops that are marketed.

Agricultural productivity is very low. The average production per ha was reported to be 7.6 bags and 16 bags for maize and rice, respectively. This is significantly low compared to the Kilimo recommendations which estimates a yield of 50 bags and 47.5 bags for maize and rice, respectively. Also the yield trend shows a significant decline during the past 12 years. In 1990 yield for maize and rice under similar level of technology of to day, was 21 and 28 bags/ha, respectively.

The reasons given for the declining yield trend include poor soils, drought and poor farming technologies of hand hoe and low input use. Crop damage by wild animals also contributes significantly in reduction of yield. In some villages, wild animals' damage was reported to account for one third of the total crop production. In addition, post harvest crop losses are high due to poor storage facilities and techniques.

Incomes and expenditure at household and VG levels

Household income levels

Data on income earning by villagers show that 84% of the respondents in Ukutu are earning less than one dollar a day. Most of the income comes from agriculture and related activities. Other sources of incomes at household levels come from business, employment, and remittances.

Since most of the production is for subsistence, total income at household level is difficult to quantify. The only income available is for those products that go through markets, which is also under reported because of poor record keeping.

Expenditure at household levels

Information on household expenditure was not easily available, especially in the form of quantities and money terms because farmers do not have tradition of keeping records for their incomes and expenditures. Rather, villagers were able to list areas of expenditure, which included, buying domestic goods, health costs, education expenses and farming costs.

Nevertheless, health and education appear to consume a lion's share of the households' incomes. Many villages do not have health services and the few with them are lacking qualified personnel and drugs. Common diseases are water borne diseases and malaria. Thus improving water sources, providing health services and controlling malaria will have a big impact on peoples' welfare.

High rates of infection lead to reduced labour force and productivity in the household, increase poverty levels among rural communities and the cost of treating diseases is considerably high and is a burden to the household already meager budgets.

Income sources by VG

The income sources for village governments depend very much on 10% of the development levy collected, cess from petty trade in the villages, fines for by-law violators, wildlife quotas and other natural resources use revenue.

Total income for VG for year 2001/2002 was approximately Tshs 37,000,000. Income per village averaged Tsh. 1,577,305/= . Income from wildlife was very high, accounting for 93.2% the VG income.

VGs expenditures

Total expenditure by VGs was high. At Tsh. 22,661,881/= this comprised 60.9 % of their total income.

There is great variation of the VGs income expenditures per village, ranging from 40% to 128%. Expenditure for wildlife management accounts for 50% of the VG incomes compared to 15% for development projects. Increasing money for development projects is perhaps the major incentive for villagers to feel a sense of ownership of the proposed pilot WMA. This in return may become an incentive for them to cooperate in protecting the WMA against poachers and illegal extraction of natural resources.

It is not clear whether the balance is saved or used elsewhere. Nevertheless, it is important for VG to have a culture of doing some saving for the part of the money earned annually to meet emergencies and other developmental issues. Saving could also be used for lending money to villagers in the long term, which could have positive impact on poverty reduction at household level.

Mechanisms for natural resource access

All villages surrounding the proposed pilot WMA have almost similar procedures for natural resource extraction. Natural resource for home use such as fuelwood collection, building poles, thatching grass, and wild foods, the villagers do extract them without any permission. For petty business related resources, the villagers need to apply through the village governments and pay a fee. For certain types of natural resources e.g. wild animals or cutting trees for timber, the permission has to come from the Director of Wildlife and the District Natural Resource Office, respectively. Nevertheless, despite the existing laws and by-laws for natural resource use, there is illegal extraction of resources in many villages.

Markets for village products

Most of the products that go through markets include maize, rice, beans and millets. Also live animals and livestock products such as meat, milk, and skins.

Generally, transport system is very poor in the area. Because of this transport costs to Morogoro town are very high. As a result, a high proportion of farmers sell their farm products locally either to itinerant traders or among the farmers themselves through periodic markets (*magulio*). High transport costs are translated themselves in prices received by farmers being very low.

Poor roads and infrastructure also limit farmers from producing potential high value but perishable crops such as tomatoes and vegetables, because they cannot sell easily.

The collapse of cooperatives has left farmers with no representative organization to co-ordinate their production; negotiate prices with buyers and campaign for better support services. Lack of market information is another factor affecting bargaining power by farmers. Most farmers do not have price information from other sources than the traders themselves. One important role the government could play in these liberalized markets could be to improve access to price information by farmers so that it discriminates less against small farmers and consumers.

The marketing situation is also not favourable for livestock keepers who complain that prices are so low that they cannot sell their herds for enough money to buy food. Good markets for livestock could lead to sustainability of the proposed pilot WMA. High price for livestock will provide incentive for livestock keepers to sell their cattle in large numbers. This would lead to availability of beef or goat meat at affordable prices and therefore reduce pressures for bush meat as a close substitute. Also selling large numbers of animals by livestock keepers will enable them to purchase enough food from farmers thereby increasing local markets for farmers. High incentives to sell livestock may reduce grazing pressure on the proposed pilot WMA, which is good for wild animals.

Economic agents

Existing investors

There are very limited investors in the villages visited. Two economic agents are known to operate in the Ukutu-UKUTU proposed pilot WMA, namely the SEBO Tourist Tented Camp and Gonabis/Kidunda Intercon Adventures Safaris. The SEBO camp is outside Selous Game Reserve. It works with JUKUMU Society in the sense that it has rented JUKUMU society's area. It recruits most of the unskilled labour locally both temporary and permanent. The investors are reported to provide humanitarian assistance in case of disaster or diseases outbreak such as Cholera, where they can provide drugs, water, drips etc. SEBO camp also pays bed rates that range from US\$ 210 to US\$ 2835 per month depending on the number of tourists received. Furthermore, SEBO tented camp pays a total rent of US\$ 700 per annum to JUKUMU Society.

Some villages are being facilitated by religious organizations especially the Anglican, Lutheran and Roman Catholic churches. These religious groups are involved mainly in education and health services on small scale basis. In Magogoni village ELCT is helping the villagers to build a health centre. For the case of facilitators/donors support there is always cost sharing element. The donors pay funds for technical support or material purchase and the local communities contribute in kind by providing labour power. They can also contribute financially from their VG earnings.

Financial facilities

Formal financial credit is not available in all the villages visited. Instead people rely on informal credit, which is limited to few thousand shillings. The money borrowed ranged between Tshs. 5,000 and Tshs. 20,000. The demand for credit is high and the main source of credit is family members or friends. The repayment is both in kind or cash.

High transaction costs related to formal credit both for lenders and borrowers limit the establishment of these institutions in rural areas. Also low money circulation and lack of collateral for rural communities create disincentives for financial institutions to provide services in these areas.

Poverty levels

Poverty levels are high in all the villages visited. Over 80% of the households are said to be relatively poor. This number is likely to be higher when one compares with the national as well as international standards of poverty monitoring indicators such as access to health services, education, life expectancy, under five mortality rate and access to clean water. These findings are consistent with the household surveys where assessment on income poverty show over 80% of the respondents are poor earning less than one dollar a day.

The poverty levels were also revealed in terms of food consumption patterns. Although people appeared to have wide range of food consumption patterns, food composition is dominated by starchy staples with very little protein and fat sources. Many villagers have only two meals a day, which is reduced to one meal during lean seasons. The few with three meals per day make a small proportion of the villagers of the area and in most cases these are civil servants employed by the local government in the area.

Economic opportunities to increase VG incomes

A high proportion of the villages visited did not have any idea on how they could increase their incomes from wildlife utilisation following the implementation of the WMAs. Many villages were not able to say anything on how they were going to improve their VGs' incomes from WMA activities. After brainstorming with the researchers the villagers were able to mention economic opportunities such as ecotourism, tourism related to water falls attractions, hot springs tourism and cultural utilization, climbing hills, campsites, optimization of game meat quota's and business on live birds and photographing. People expressed interest of practicing beekeeping. Also fishing is one of the potential areas to increase wildlife income and nutrition by villagers.

Optimal use of wildlife quota

Many villages reported under-utilization of their wildlife quotas and poor selection of animals as the major factor denying both their meat and incomes. They feel that proper utilization of their quotas should be one of the potential areas to boost their economies. Most villagers regard legally obtained bush meat to be the primary benefit of the community based wildlife management programme.

Hot spring

The villagers explained that on the western side of Kisaki Kituoni village there are hot springs. This is regarded as a natural gift and is treated as a sacred place where elders offer sacrifices or pray for rain or blessings in case of any bad omens within the village. With good management the villagers could enjoy sulphur baths, which is recommended for healthy body skin.

Tourist and resident hunting

Hunting has the advantage of generating considerable revenues right from the beginning with little or no investments needed by the AA. The resource is already presented and available for operation. Hunting can generate profits early that communities can and should reinvest into the other economic opportunities. Nevertheless, hunting tourism to be sustainable, consumptive use of wildlife should not jeopardize the biological and ecological basic requirements. This could be achieved through the systems of monitoring the game populations, and must be jointly developed and implemented by the WD and the AAs along with the system of enforcing quotas.

0.4 Ecological Aspects

Vegetation

Ranges between Acacia to miombo woodlands with interspersed riperian vegetation, bushland and thickets; some of the areas are open grasslands

Wildlife Populations

Table 1 provides an estimate of animal numbers, species and densities in the proposed pilot WMA.

Table 1: Estimated Number of Wildlife in the Dry Season –2003, Ukutu-JUKUMU

Species	Number of Known Groups and Estimated Number for Each Group	Total Estimated Number
Buffalo	6 groups @ estimated at 400-500	2,700
Lion	-	40
Elephants	3 groups @estimated at 20-30	75
Zebra	10 groups @estimated at 60-80	700
Giraffe	-	300
Wildebeest	-	4,000-5,000
Eland	3 groups @ estimated at 30-33	94
Impala	2 groups @ estimated at 25-30	55
Gazelles	15 groups @ estimated at 30-40	525
Leopard	-	15-20
Waterbuck	5 groups @ estimated at 15-20	92
Reedbuck	-	2,000 – 3,000
Hippopotamus	-	30-50

Source: Field data, 2003.

Wildlife Utilization

Tourist hunting is the major activity in Ukutu-JUKUMU; JUKUMU Society has so far enjoyed a hunting quota of 3 buffaloes and 10 wildebeests.

Wildlife Movements

Ukutu-JUKUMU: a dispersal area for the Selous GR and Mikumi NP.

Human-Wildlife Conflicts

Crop raids and livestock attacks by problem animals are major problems in all the villages surrounding the proposed WMA. Crocodiles are a major problem in Ukutu-JUKUMU rivers.

Potential WMA Management Problems

Wild fires are constantly set on by honey gatherers and poachers in Ukutu-JUKUMU.

0.5 Emerging Issues

Based on the above findings and field visits the following are the emerging issues observed:

- Level of knowledge and awareness regarding these new concepts of WMA and AA by villagers including village governments is very low or non-existence. This may affect local communities bargaining power relative to investors and joint ventures related business.
- Natural resource use by villagers is considerable but difficult to quantify and to put in money terms because is used mainly on subsistence levels or used illegally.
- Most of the natural resources is extracted free of charge because either by-laws are not developed or they are not enforceable.
- The capacity to keep records for incomes and expenditure by households and village governments is very poor and in some villages not transparent enough.
- A good proportion of the VG incomes seem to have been used in administrative matters rather than villages' development projects.
- Capacity to identify economic opportunities for their WMA by villages is low which may undermine their bargaining power with investors.
- The benefits accruing from WMA are likely to benefit the community rather than individual households especially in the initial years of implementation. Families that depend on natural resources for subsistence may suffer following WMA implementation.

0.6 Conclusion and Recommendations

During this study there was no any joint venture existing between villagers and investors. What was seen is cost sharing between government/donors and local communities, e.g. in areas of education, health and irrigation projects. In most cases the donor/facilitator provides funds or expertise and the communities provide labour force.

Incomes and expenditure by village governments are not clear and transparent enough in some villages. Also income from natural resource for developmental projects is not clearly indicated which is difficult to make a follow-up. Proper monitoring of the impact of WMA concept will only be possible if there is proper record keeping in villages' incomes and expenditures.

Although many villages are likely to benefit from WMA implementation, most of these benefits will be accrued at communal level and not household. There will be losers from natural resource livelihoods e.g. food extraction and this category of people may need to be compensated.

Crop destruction by wild animals is considerable in all villages visited. These affect villagers' crop harvest and incomes. The destruction by wild animals is also experienced by livestock keepers where several animals have been killed by wild animals such as Lion, Leopards etc.

Due to similar ecological background, the economic opportunities are likely to be similar in all WMAs. Nevertheless, the efficiency in running these economic activities is likely to differ from one WMA to another depending on different reasons including wildlife richness, type of wildlife existing, infrastructure, knowledge and experience in conservation.

There should be immediate and extensive awareness raising programme for the villagers surrounding the WMA and capacity building in WMA, AA and general managerial skills for the key players of the VGs. This work should be performed by WD.

There should be training for households and VG in records keeping for incomes and expenditure as well as quantity/volumes harvested, marketed or consumed. Also there should be external board to audit VGs' incomes and expenditures. This work should be implemented by DW in collaboration with Ministry of Finance or Cooperatives.

The MNRT need to contract another firm (economic) to undertake a detailed study in villages surrounding the proposed pilot WMA to establish cost benefit analysis and comparative advantages for each village. This is important for each village to operate in an area where it is more efficient and competitive. Comparative advantage will be in terms of wildlife resource endowed, transport advantage, time invested in the business, etc.

The WD should look on ways of compensating households, which their livelihood to a high extent depends on natural resource use. This could be through providing alternative livelihoods.

Improvement of good governance at the village level is crucial; there is need for transparency and accountability; capacity building is also imperative, especially capacity to keep records and identify economic opportunities.

Shortage of back-up staff at ward and district levels needs to be addressed.

Awareness raising about the proposed WMA initiative to the local communities is imperative.

There is need to identify and map all wildlife corridors which are increasingly being taken up for agriculture expansion in Ukutu-JUKUMU.

Conduct studies on the viability of conservation compatible activities such as beekeeping, fish farming, etc, in Ukutu-JUKUMU.

0.8 Way Forward

The most deficiency observed in the field is the knowledge gap and awareness about the whole idea of WMA and AA by villages. A high proportion of the villagers, including VG members, do not know exactly what is going on and how this is going to affect their socio-economic lives. Awareness raising for the whole community surrounding the WMA and capacity building for key players in the VG should be the starting point of WMA implementation by the government, donor community and NGOs.

Educating villagers on the WMA and associated packages is also important for bargaining power with investors. Education also should be extended to teaching people basic principals of project appraisal and book-keeping or general management skills. Field observation show that VGs cannot keep even simple records for income and expenditure for their villages. Proper monitoring of the impact of the WMA concept will only be possible if there is proper record keeping in villages. Record keeping techniques should extend to households in terms of harvests, marketed and consumption.

Help villages to develop by-laws for natural resources utilization as incentives to increase VG incomes and sustainable utilisation of natural resource. Most villages do not know how they will increase their incomes based on this new policy of WMA. At least in the initial years of WMA implementation the proposed WMA should be allocated with a facilitator that could help them in identifying and implementing economic opportunities.

Since level of investment and joint venture between investors and local communities is almost non existent at least to the knowledge of villagers, the government should try to build capacity in these aspects providing skills related to investment and joint ventures.

The WMA should be helped to develop general management and land use plans by the MNRT and Ministry of Land and Urban Settlements. This is undoubtedly important and a necessary first step for better identification of land use patterns and economic opportunities.

1.0 INTRODUCTION

1.1. Background

The government of Tanzania through its Wildlife Policy (1998) is advocating the establishment of Wildlife Management Areas (WMAs) as a means of effectively implementing Community Based Conservation (CBC) activities in Tanzania. The underlying assumption is that WMAs will be established where there is a ‘health’ population of wildlife. WMAs, despite their conservation roles, will run as business entities parallel to other production systems in village lands, as will be determined by land use plans. The new policy stipulates that local communities will benefit directly from wildlife conservation economic opportunities through direct management of WMAs. Benefits are expected through formation of joint ventures and benefit sharing. In this process the CBC in WMAs will be implemented by Authorized Associations (AA). The AAs are basically individual groups and designated organizations within the villages. The AAs will be given authority by the Village Council to manage wildlife outside NPs and GRs. About 15 sites will implement WMAs on a pilot basis for the period of three years.

The concept of WMAs is to be implemented under the Wildlife Conservation Act (1974) as translated in the Wildlife Management Authorities (WMAs) Regulations of 2002, and the Guidelines for designation and management of WMAs which support the implementation of the Wildlife Policy of Tanzania (1998). The Guidelines are administrative rules, which are intended to rationalize in practical terms the Wildlife Conservation (WMAs) Regulations, 2002.

Much of the initial focus of CBC has been on wildlife, which is threatened with displacement by illegal use and growing rural human populations. The new policy approach underlying the WMA concept devolves rights over wildlife to local communities and aims to make wildlife conservation part of the rural poverty alleviation process. In this context, the WMA initiatives must be financially attractive for the community, economically efficient for the nation and financially viable for donors and

the government. Without these incentives, WMAs will not be sustainable, and will not alleviate poverty or conserve wildlife.

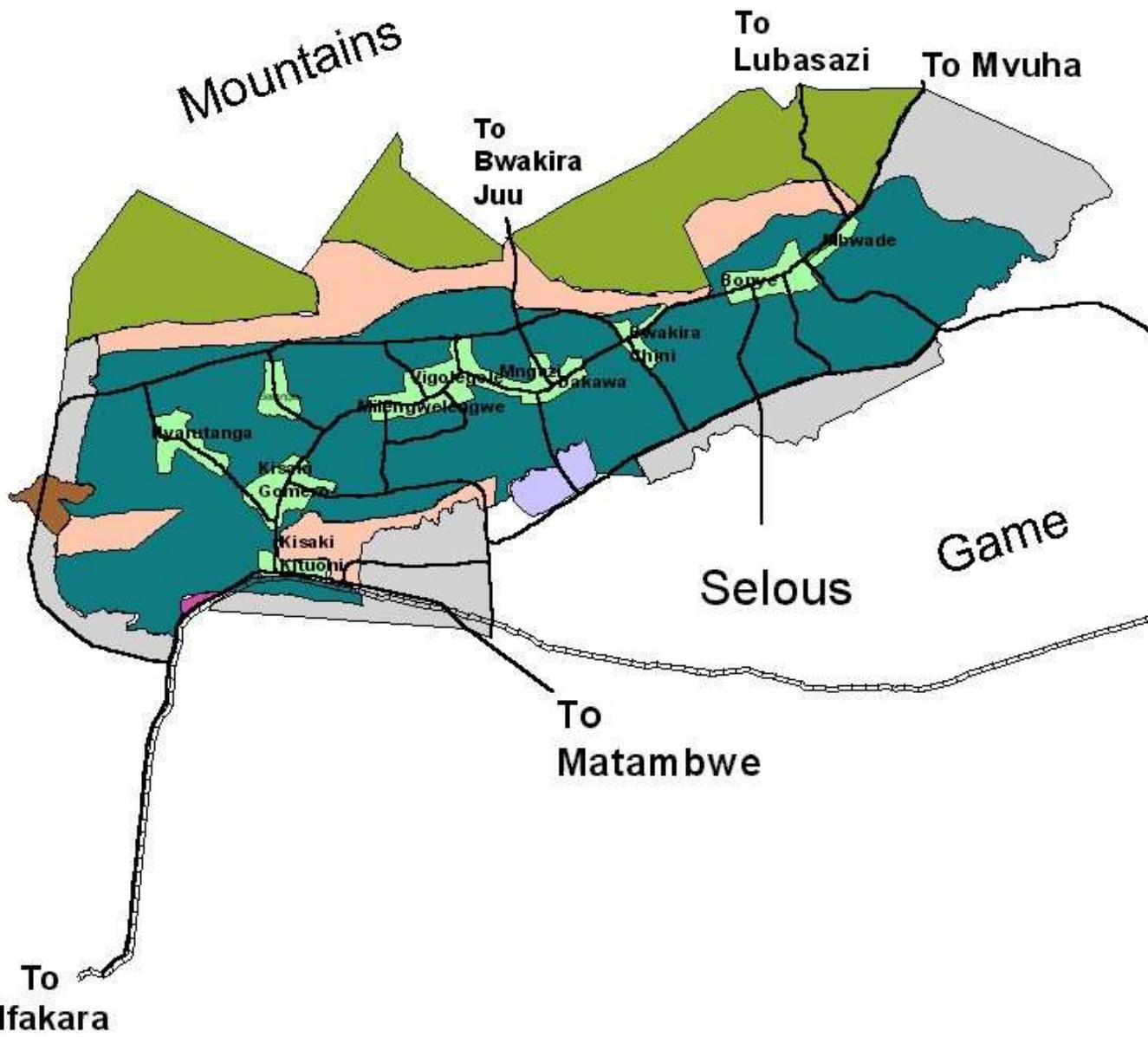
1.2 Study Objective

The main objective of this study was to facilitate the collection, analysis and compilation of baseline information from 15 pilot WMAs. This information is intended to be the basis for the development of Monitoring Indicators and Monitoring Plans during the implementation of the WMAs.

Hereunder we present the results of the baseline survey done in Twatwatwa village and one of the villages surrounding the proposed pilot WMA. This report is divided into four sections. The introductory section is followed by a second section that provides the sociological aspects of the survey. The third section then discusses the economic aspects of the communities, while the fourth and last one presents the ecological aspects of the proposed pilot WMA.

1.2 The Study Area

The proposed UkuTU-JUKUMU WMA is 750 sq.km. The area is managed by 21 villages (Map 1). The proposed WMA and surrounding villages have been surveyed and mapped by UCLAS, formerly Ardhi Institute.



Map 1: Location of the Ukutu-JUKUMU WMA

The Ukutu WMA area consists mainly of low lying floodplain of the foothills of the Uruguru Mountains which lie to the North. Ukutu WMA borders onto three protected areas. The project borders three protected areas, namely the Selous Game Reserve, the Mikumi National Park and the Mkulazi Forest Reserve. Most of the people in the Ukutu

WMA surrounding villages are concentrated along the main road between Morogoro and Kisaki with almost a continuous line of settlement between Mvuha and Kisaki Station.

The Ukutu WMA was initiated in the Kisaki-Mvuha buffer zone, which comprises the wards of Kisaki, Mngazi, and Mvuha. Initially it involved 16 villages. At later stage the Serembela-Kidunda area was included involving a further four villages. Again some two more villages were added making a total of 22 villages currently.

Topographically the area consists of mainly low-lying flood plain. The foothills of Uluguru Mountains, which lie to the north, extend into the area creating some upland areas of 120 to 500m. The area falls within the intermediate tropical climate zone, and as such is influenced by two rainfall cycles per year with a long rainy season from March to May and shorter rains around November/December. Average annual rainfall ranges from 600mm to 1200 mm, and surface water is plentiful in the area due to the presence of a number of rivers.

The average population per village is 2,236 people with 416 households. Each village was surveyed and a land use plan was carried out to indicate the location of village WMAs (MNRT 1996). The percentage for wildlife area ranges from 0 (five villages) to 81% (one village). Average wildlife area per village is 33.2%. (Table 1). The wildlife area accounts for 40% (or 1670 sq. km).

The central part of this area is known as Gonabisi, which is a floodplain that is particularly rich in wildlife. Unfortunately, access to the area is limited for much of the year by the Mgeta, Ruvu and Dete rivers. Poaching is known to increase during the wet season when hunting companies and village scouts have limited access. Gonabisi is currently designated as an open area and is used for hunting by the company using adjacent blocks in the Selous. Ukutu-JUKUMU WMA practise village hunting and safari hunting and has one safari block (MNRT 1996:90). Each village has a wildlife management committee for administering its wildlife area. Table 1 illustrates villages forming the Ukutu-JUKUMU WMA, their area and extent of wildlife areas per village.

Table 1: Village Population, Households, Area and Percentage of Wildlife Area

Village	Population	Households	Area km ²	Wildlife Area km ²	% Wildlife Area
Mngazi	1,909	318	32.3	0	0
Vigolegole	2,945	589	45.3	0	0
Mvuha	3,158	632	79.5	0	0
Dala	-	-	-	-	-
Lukulunge	3,579	716	26.2	0	0
Bonye	3,509	585	128.8	78.5	61
Mbwade	2,685	384	164.5	51.1	31
Bwakila Chini	1,936	323	76.2	9.8	13
Dakawa	2, 419	403	47.3	19.9	42
Kisaki St.	2,225	371	179.2	100.5	56
Gomero	3,995	666	54.5	10.7	20
Nyarutanga	3,670	612	98.3	48.8	50
Milengwelengwe	1,404	281	16.2	0	0
Sesenga	1,357	339	82.5	11.4	14
Magogoni	885	148	174.7	141.5	81
Kiganila	2,128	266	42	22.6	54
Bwira juu	881	220	38.5	21.6	56
Bwira chini	2,961	370	32.8	10.6	32
Kiburumo	-	-	-	-	-
Kongwa	1,153	231	122.8	66.7	54
Tulo	1,023	205	95.5	43.4	45
Kidunda	3,313	663	132.8	72.7	55
Total	44,716	8,322	1,670	710	664
Average	2,236	416	83.5	35.5	33.2

Source: MNRT 1996; Survey Data.

1.4 Literature Review

1.4.1 The concept "Community Based Natural Resources Management" (CBRNM)

Recognition that successful management of protected areas ultimately depends on the cooperation and support of the local people has been growing among conservationists and natural resources managers in many places in the world. Projects like the Communal Area Management Plan for Indigenous Resources (CAMPFIRE) in Zimbabwe and the Luangwa Integrated Resource Development Project in Zambia have been established under such an assumption and have recently taken the limelight as models of this supposedly new outlook in the management of natural resources in protected areas (Wells and Brandon, 1993).

This outlook is not new to Tanzania. The problem of environmental degradation has been the concern of the government for a very long time. Since the colonial period widespread

efforts have been made to conserve and improve natural resources such as forests, wildlife and land. Generally, three types of conservation initiatives and programmes can be distinguished. These are the preservation of forests and wildlife, the rehabilitation and improvement of degraded lands, and environmental resource improvement efforts undertaken at the initiative of local communities and grassroot organizations with varying degrees of financial support of central government, local and foreign donors (Mung'ong'o, 1996).

The preservation of forests and wildlife began during the German period and was emphasized during the British time by gazetting more conservation areas. People living on the periphery of gazetted national parks, forest and wildlife reserves were evicted to protect the reserves from "poaching" and encroachment. In the wake of Independence from the colonial government in 1961, wildlife parks and forest reserves were increased to cover almost 30 per cent of the country's land resources. (Table 2).

Table 2: Land Use in Tanzania

Land Use Category	Area (sq.km.)	Percentage
National parks	41,038	4
Game reserves	102,719	11
Forest reserves	126,306	13
Crop cultivation	51,900	5
Pastures	350,000	37
Other land	214,039	23
Lakes	59,000	7
Total	945,000	100

Note: These figures are very broad estimates. No comprehensive assessment of land use exists so far in Tanzania. Different sources have different estimates.

Source: Mung'ong'o, 1995:82.

Such government initiated conservation efforts had generally not only ignored the needs of the inhabitants and communities living adjacent to game parks and forest reserves, but had

also more often deprived them of various means of subsistence through eviction or restrictions on their access to land, forests and pastures. Conservation programmes had therefore become indistinguishable from the destructive aspects of the dominant patterns of development (Ghai, 1994:7).

It was in realization of these weaknesses in the prevailing approach to conservation, perhaps, that some initiatives like that of the Ngorongoro Conservation Area Authority in 1975 began experimenting with the idea of *multiple land use* in the management of the Ngorongoro Conservation Area (NCA). The aim of the programme was to integrate conservation of the Ngorongoro Crater and its archeologically important environs and livestock grazing by the inhabitant Maasai pastoralists (Boshe, 1989). The thirty years of a largely success story of the operationalization of the concept of multiple land use have led not only to attempts by other conservation areas wishing to emulate the experiment, but they have also virtually fostered the emergence of a new rural development paradigm in Tanzania.¹

The underlying assumption of the paradigm has been that local communities will best manage natural resources such as wildlife and forests if they are assured of clearly defined user rights, proper incentives, information and the know-how to do it. The local people are thus expected to participate in the process of design, establishment and management of the conservation areas.

The aim of such a participatory approach to decision-making is to allow the stakeholders to express their objectives in natural resource use and management, and to decide on how these can best be achieved. It furthermore allows the stakeholders to evaluate the alternative uses of the ecosystems according to their specific rationales; hence also effectively empowering the local people to make better use and protection of their environment. At a more theoretical level it provides better information to be used in resource management as a

1. The NCA has, for example, retained some of the most spectacular combination of scenic, wildlife and archeological qualities in the world so as to acquire the status of a World Heritage Site in 1979 and a Biosphere Reserve in 1982.

result of the intermarriage between indigenous knowledge and scientific knowledge (Tacconi and Bennett, 1995:93).

1.4.2 Problems and prospects of CBNRM

Of recent wildlife conservation in Game Controlled Areas (GCA) and communal lands has become difficult to implement in a centralized manner. It has also become difficult to justify in economic terms. In the preceding paragraphs we have highlighted the changing perception and approach among natural resources managers and conservationists at both the national and district levels towards a recognition that successful management of protected areas ultimately depend on the cooperation and support of the local communities. We have noted the underlying assumption of the emerging paradigm as being based on a belief that local communities value natural resources such as wildlife and forests and would manage them best if they were assured of proper incentives, information and the know-how to do it.

1.5 Methodology

Both primary and secondary data were collected from the 19 villages surrounding the Ukuwu-JUKUMU WMA. The methodology used in accessing these data is detailed in Vol. I of this four-part report.

FINDINGS

2.0 SOCIOLOGICAL ASPECTS

2.1 Demographic trends

Table 3 illustrates the population change in communities living around the Ukuwu-JUKUMU WMA. Data from the 1988 and 2002 census years show that the population growth in the area is very gradual. Much of the population growth has been recorded for Kiasaki ward (26%), followed by Singisa (18%), Mvuha (17%) and Mngazi (17%) wards. The least growth is recorded for the two Bwakila wards (16% each).

Table 3: Population Change in Communities Surrounding the Ukutu-JUKUMU WMA

Ward	1988			2002			% Pop. change
	Total pop.	No. H/holds	H/hold size	Total pop.	No. H/holds	H/hold size	
Mvuha	8,115	1,533	5.2	9,478	2,089	4.5	17
Selembala	4,708	814	5.7	4,688	998	4.7	-
Bwakila Chini	10,021	1,614	6.2	11,601	2,568	4.5	16
Bwakila Juu	4,901	982	4.9	5,659	1,199	4.7	16
Kisaki	10,200	1,616	6.3	12,888	3,008	4.3	26
Mngazi	7,228	1,457	4.9	8,486	1,914	4.4	17
Singisa	9,593	1,948	4.9	11,283	2,363	4.8	18
Total	54,766	9,964	5.4	64,083	14,139	4.6	17

Source: Census Reports 1988 & 2002

2.2 Migration Patterns

The original ethnic groups to inhabit the villages surrounding the Ukutu-JUKUMU pilot WMA were the Kutu, an ethnic group with close affinities to the Lugulu of the Uluguru Mountains. But many other groups have since settled in these wards in recent years, including the Luguru, the Pogoro, the Ngindo, the Ngengereko, the Ngoni, the Zaramo and other smaller groups. Some of these groups moved into the area as early as the 19th Century due to tribal warfare and incessant famines. However, more recent comers were drawn to the area by the agricultural potential provided through the cultivation of sesame(SCP/GTZ, 2002).

All the same, in-migration to the area seems to have dissipated now. Interview data show, for example, that 56.8% were born in the villages of residence, some 16.7% were born in different wards but same district, and only 15.9% were born in different regions. Of those who moved into their present villages 24.4% did so in search of agricultural opportunities. The wards have also a sizeable number of livestock keepers, especially the Maasai and Barbaig.

There is comparatively little out-migration from communities in these wards. Interview data show that only 43.4% of the respondents knew someone who had moved out of their households. These were mostly youth who had gone out in search of employment or business opportunities. Most of the females had gone out in marriage. Almost a similar percentage (48.9%) of households reported knowing someone who had in-migrated to their villages of residence. The reasons for their in-coming were, however, different. A majority (57.5%) had come in marriage, while 25.3% had come to live with relatives. The latter group comprised of the 65 and above age cohort. Much of the population growth in most of the villages is, therefore, from natural growth rather than in-migration.

2.3.1 Type of households

Rural households in Tanzania are normally headed by male members of the community. If not a husband then it is a close kin - a son, a brother, or an uncle. Such is the situation in two divisions. According to interview data 76.5% of the respondent households were headed by males. Only 23.5% Of the households were headed by females as a result of divorce or widowhood.

2.3.2 Household size and composition

Household sizes in the village vary greatly depending on the type of household. In well-off households where polygyn, extended families and bonded labour arrangements are the norm many people tend to stay in one household. On average, however, the household size in the seven wards of the Ukutu-JUKUMU WMA has decreased through the two census years from 5.4 to 4.6 people in 1988 and 2002, respectively. (Table 3). The reasons for the decrease are not well known.

2.3.3 Dependence ratios

A dependence ratio is the product of the total number of children, the old and the disabled (the dependents) divided by the number of able-bodied adults who form the labour force of a household. The ratio of dependence varies between wealth groups in the villages. The highest is among the middle and the well-off wealth groups, followed by those of the poor social groups. This tendency is explainable by differentiated access to labour. The well-off households have the biggest labour force in the villages and can thus afford to keep large families. On average, however, the dependence ratio in the two villages of Kongwa and Tulo where data were available is 2.9.

2.4 *Natural Resource Use Patterns*

According to the group discussions the main natural resources, other than land, used by the people of the seven wards from the local forests is fuelwood, building poles, timber, wild vegetables, game meat, ropes, medicinal plants and thatch grass. Others are honey and fruits. The interview data indicate that the local forest is depended upon by the local people for woodfuel (61.8%), for charcoal (26.6%), for building poles (20.9%), for thatch grass and game meat (19.1%, respectively) and for medicinal plants (16.5%). Because of the activities of JUKUMU Society wildlife is recognized as an important natural resource in the 19 villages visited.

2.5 *Institutional Set-Up*

In all the villages visited during this survey the standard village government (VG) structure was prevalent. Below the Village Assembly (Box 2) the VG was headed by an elected Village Chairman. The Chairman was supported in their day to day activities by an appointed Village Executive Officer. These people were in turn supported by three Village Committees (VCs) for Planning and Finance, Social Services and Peace and Security. Under each of these VCs there are various Sub-Committees for various issues, e.g. sub-committees for village shops, milling machines, water supply, the village school, the environment or natural resources, et cetera.

Box 2 Village Assembly

- The village assembly is composed of all villagers, women and men, who have reached the age of 18 years, and chaired by the Village Chairperson. It operates as the village parliament.
- The village assembly is a formal body that is supreme within the village government structure.
- The village assembly is required to meet, by law, every three months. There must be proper notification so that all villagers in all sub-villages have had adequate notice of the meeting and its agenda.
- The village assembly has the power to elect village government leaders, to recommend village bye laws to be sent to the District Council for approval, and to direct the village government to take specific action and to monitor implementation, to receive village government budgets and financial reports, to discuss policy, and to supervise allocation and use of all village resources,
- The village assembly has the final power to allocate land within the boundary of the village.

By law the village assembly is a very powerful body, although in practice it has been weakened.

2.6 Issues of Governance

Good governance is imperative in any development initiative. In this study local government institutions were analyzed in each of the visited villages to gauge their effectiveness as development levers. Generally, there are serious weaknesses in governance in all the villages. Leaders elected/chosen to lead the various institutions, including the village government, are not trained to do their duties well. Principles of good governance are not imparted to the incumbents. Neither are their responsibilities to their constituencies properly understood.

The village chairpersons are also chairpersons of the Ruling Party. Due to the infancy of Opposition Parties there is virtually no watchdog to criticize or forestall any excesses or abuse of power in the villages. On the other hand, where the opposition parties had gained power in the village great strife was observed in executing development projects. In Mvuha, for example, where the Village Chairman was from the Tanzania Labour Party the Wildlife Management Committee lacked transparency ostensibly due to a leadership crisis based on ideological differences.

2.7 Relationship Between Village Governments and CBOs

Apart from JUKUMU Society there are very few Community Based Organizations operating in the 19 villages visited. Those that are operative belong to church missionaries and most deal with offering social services such as health care and education.

2.8 Villagers' Solidarity and Participation in Community Development Initiatives

Although local governance is problematic in most of the study villages, it is more so in villages led by opposition parties, such as Mvuha. In these villages there is a major rift between the village council leaders belonging to CCM and those of the opposition. People's participation in decision-making and leadership accountability in resource allocation is at its minimum in these villages. Meetings are not called and income and expenditure reports are not regularly submitted to the Village Assembly. Village council leaders belonging to CCM have more often than not been a cog on the wheel; trying as much as possible to sabotage the efforts of the opposition chairpersons for political reasons.

2.9 Understanding the Concept WMA

A majority of the respondents (68.4%) indicated that they understood the concept by properly mentioning the three components of participation, benefit sharing and resource conservation. The rest mentioned participation alone, participation and resource conservation, participation and benefit sharing, benefit sharing and resource conservation, et cetera. The concept is, therefore, fairly well understood and liked by many of the respondents (91.5%). As was the case with the MBOMIPA villages, this is also most likely a result of the good work of JUKUMU Society in the 20 programme villages.

2.10 Emergent Issues: A Discussion

2.10.1 Good governance

Representative democracy relies on elected representatives, namely Members of Parliament, District Councilors, Village Councilors and Village Chairpersons to act on behalf of those who elected them. As observed in the case of MBOMIPA villages, the

representative system is also not functioning properly in JUKUMU villages. Villagers were concerned that some MPs and district/village councilors do not engage in regular consultation processes with their local constituents, nor did they report back on decisions made in Parliament. It was affirmed by many villagers that their representatives ‘... are around during election campaigns, and then they disappear.’ Here too the situation was leading to growing tension between elected and appointed officials on the one hand, and ordinary citizens on the other.

Underlying resistance at the local level to democratisation of local government is a deep-seated distrust in central and local government of pluralism and public dissent. A low tolerance for difference and alternative views reflects not only formal ‘modern’ government structures but ‘traditional’ communal values. The central principle of representative democracy is that people use the power of the vote to choose the leaders they wish, in order to get the kind of policies they want. The hostile reactions shown by some leaders towards local moves of self-organisation and dissent indicate the unwillingness among many to accept this principle, and the desire to hold onto power by any means.

2.10.2 Administrative constraints

The managing of WMAs through Natural Resources Committees requires a local leadership that is incorruptible and well versed in wildlife issues. Such type of leaders is not easily available in most of the villages visited. Capacity building should be a major activity in the pilot WMAs.

Apart from JUKUMU Society, Morogoro Rural District have little capacity to manage the proposed pilot WMA. There are, for example, very few wildlife officers at the district headquarters with no reliable transport facilities to visit all the villages of that vast district. Moreover, there seems to be a misunderstanding between the Regional Natural Resources Office and the District Natural Resources Office as to who should be responsible for the supervision of the activities in the proposed WMA. In the event JUKUMU Society winds up its activities the district cannot carry over the role played by

that project. The establishment of the WMA should, in this respect, go parallel with the clarification of roles between the region and district, and the employment and training of enough wildlife officers, especially at the ward level to facilitate supervision of village game scouts.

2.11 Conclusion and Recommendations

The institutional set up put in place to manage wildlife resources is very well organized via the activities of JUKUMU Society. The level of awareness seems also to be quite high. If given the necessary financial and technical support and political will these communities can manage their wildlife resources reasonably well.

2.12 The Way Forward

In the foregoing discussion two points have been raised as the way forward. These are:

- Capacity building should be a major activity in the pilot WMA.
- The establishment of the WMA should go parallel with the employment and training of enough wildlife officers, especially at the ward level to facilitate supervision of village game scouts.

3.0 ECONOMIC ASPECTS

3.1 Introduction: JUKUMU Society

In 1995 nineteen villages decided to form an NGO with the target to improve the sustainable utilization of natural resources of the member villages. A constitution was developed and the Board of the Society and Trust elected. In 1996, the NGO was registered under the name JUKUMU Society (*Jumuia ya Kuhifadhi na Matumizi Bora ya Maliasili Ukutu*). Today JUKUMU Society has performed the following:

- Employed village scouts on permanent employment basis.
- Protects common WMA against encroachment and poaching.
- Coordinates the patrol,
- Coordinates small scale cropping activities and transport of meat from quota system,
- Deals with purchase of ammunition, hunting rifles, food for scouts and other equipments,
- Development of management plan and by-laws for their WMA
- Advisory services for membership villages concerning village development projects and natural resource management
- Controlling of a budget and accounts of membership villages

3.2 Land Use Patterns

There are different land uses in Ukutu WMA. These include the residential, agricultural land, forest land, grassland, swampy area, railway line and road network which links the other land uses together and with the Selous Game Reserve and Mikumi National Park. Only 10 villages have land acreage units for their land under different uses. The majority 12 villages do not have. This partly occurred because many villages do not have land use plans. Table 2.0 summarizes different land uses and their respective areas.

Table 2.1: Land Use Pattern

Village	Total area (km ²)	Total area wildlife (km ²)	unde al (km ²)	Residenti al (km ²)	Agric. (km ²)	Grazing (km ²)	Forest (km ²)
Mngazi	32.3	0	200	950	-	2083	
Vigolegole	45.3	0	183	1817	-	2533	
Mvuha	79.5	0	-	-	-	-	
Dala	-	-	-	-	-	-	
Lukulunge	26.2	0	-	-	-	-	
Bonye	128.8	78.5	100	5017	233	7533	
Mbwade	164.5	51.1	150	5867	-	10433	
Bwakila Chini	76.2	9.8	133	2833	300	-	
Dakawa	47.3	19.9	150	1633	-	2950	
Kisaki St.	179.2	100.5	183	867	650	13184	
Gomero	54.5	10.7	400	2567	-	2483	
Nyarutanga	98.3	48.8	283	3433	-	6617	
Milengwelengwe	16.2	0	83	1553	-	-	
Sesenga	82.5	11.4	-	-	-	-	
Magogoni	174.7	141.5	-	-	-	-	
Kiganila	42	22.6	-	-	-	-	
Bwira juu	38.5	21.6	-	-	-	-	
Bwira chini	32.8	10.6	-	-	-	-	
Kiburumo	-	-	-	-	-	-	
Kongwa	122.8	66.7	-	-	-	-	
Tulo	95.5	43.4	-	-	-	-	
Kidunda	132.8	72.7	-	-	-	-	

- information not available

Source: MNRT 1996, URT 1991

3.3 Village Economic Status

3.3.1 Socio-economic services

All villages in Ukutu are accessible through roads or footpaths. These roads and footpaths connect the villages with regional headquarters, Mikumi and Ruaha National parks. However, the roads are of earth surfaces, they are poor and many are impassable during rainy seasons. As a result, during rainy season road transportation is very difficult and movement from place to place is mainly by feet, bicycles, tractors and lorries. Even during dry season there is only one bus to the regional headquarters. There is also Uhuru railway line (TAZARA) services in the area, which connects the WMA with DSM and

southern regions of Iringa and Mbeya. Existence of TAZARA railway has promoted agriculture and lumbering activities for villages along the railway.

A high proportion of the village use water from wells (improved and traditional wells) and rivers. The water services were reported to be inadequate both for quality and quantity.

Health services are appalling in the WMA where 50% of the villages (11 villages) do not have health centres. Even where health centers exists they are under equipped both for staff and medicine. The same situation was reported for education services. Although only one village (Bwira juu) do not have a school, many schools were found in bad shape needing major rehabilitations. The teachers, the classrooms and the desks were all inadequate.

There are three major sources of energy in the area. Fuelwood, charcoal and kerosene. Diesel for tractors, trucks, milling machine and kerosene for lighting are obtained from regional headquarters. A high proportion of the village residents use fuel wood for cooking which is obtained locally. It is only a few number of servants who occasionally use charcoal and very few use kerosene stoves for cooking and these are mainly civil servants in the area. Table 2.2 illustrates socio-economic infrastructure in Ukutu WMA.

Table 2.2: Socio-economic services

Ukutu	Transport	Energy	Water	Health services	Education	Shops/Viosk
Mngazi	Road not reliable during rainy season	Fuelwood, kerosene, charcoal	Wells and river water	1 dispensary	1 primary school, not adequate in terms of teachers, classrooms, desks and teachers' houses	6-inadequate
Vigolegole	Road not reliable during rainy season	Fuelwood, kerosene, charcoal	Wells and river water	1 dispensary	1 primary school, not adequate in terms of teachers, classrooms, desks and teachers' houses	5-inadequate
Mvuha	Wells, rivers	Fuelwood, kerosene, charcoal	Wells and river	1 health center, 1 pharmacy	1 primary school	7-inadequate
Dala	Wells, rivers	Fuelwood, kerosene, charcoal	Wells and river	0	1 primary school	2-inadequate
Lukulunge	Wells, rivers	Fuelwood, kerosene, charcoal	Wells and river	0	1 primary school	1-inadequate
Bonye	Road , waterways not sufficient	Fuelwood, kerosene, charcoal	Wells and river	1 health center	1 primary school	5-inadequate
Mbwade	Road , waterways not sufficient	Fuelwood, kerosene, charcoal	Wells and river	1 health center	1 primary school	7-inadequate
Bwakila Chini	Road	Fuelwood, kerosene, charcoal	Wells and tape water	0	1 primary school	4-inadequate
Dakawa	Road	Fuelwood, kerosene, charcoal	Wells and tape water	0	1 primary school	4-inadequate
Kisaki Station	Road , waterways and train but not sufficient	Fuelwood, kerosene, charcoal	Wells and river	1 health center	1 primary school	3-inadequate
Gomero	Road ,	Fuelwood, kerosene,	Wells and river	1 health center	1 primary school	10-nadequate

	waterways and train but not sufficient	charcoal				
Nyarutanga	Road , waterways and train but not sufficient	Fuelwood, kerosene, charcoal	Wells and river	1 health center	1 primary school 1 Secondary school	2-inadequate
Milengwelengwe	Road and waterways but not sufficient	Fuelwood, kerosene, charcoal	Wells and river	0	1 primary school 1 Secondary school	9-inadequate
Sesenga	Road and waterways but not sufficient	Fuelwood, kerosene, charcoal	Wells and river	0	1 primary school	6-inadequate
Magogoni	Road and waterways but not sufficient	Fuelwood, kerosene	Wells and river	1 health center	1 primary school	1-inadequate
Kiganila	Road and waterways but not sufficient	Fuelwood, kerosene	Wells and river	0	1 primary school	0-inadequate
Bwira juu	Road and waterways but not sufficient	Fuelwood, kerosene	Wells and river	0	0	0-inadequate
Kiburumo	Road and waterways but not sufficient	Fuelwood, kerosene	Wells and river	0	1 primary school	0-inadequate
Bwira chini	Road and waterways but not sufficient	Fuelwood, kerosene	Wells and river	0	1 primary school	0
Kongwa	Road and waterways but not sufficient	Fuelwood, kerosene	Wells		1 primary school	2
Tulo	Road and waterways but not sufficient	Fuelwood, kerosene	Wells	0	1 primary school	2

3.3.2 Village economic activities

Village economic status is mainly influenced by the economic activities undertaken. The village do not differ much from one village to another partly because of similar geographical location, rainfall pattern and infrastructure. The major activities existing include agriculture, livestock keeping, petty trade and fishing. Table 3.2 displays major economic activities in Ukutu WMA.

Table 3.0: Economic Activities in Ukutu WMA

Village	Activity 1	Activity 2	Activity 3	Activity 4
Mngazi	Farming	Business	Livestock keeping	Fishing
Vigolegole	Farming	Business	Livestock keeping	Fishing
Mvuha	Farming	Business	Fishing	
Dala	Farming	Business	Fishing	
Lukulunge	Farming	Business	Fishing	
Bonye	Farming	L.keeping	Business	Fishing
Mbwade	Farming	L.keeping	Business	Fishing
Bwakila Chini	Farming	Livestock keeping		
Dakawa	Farming	Livestock keeping		
Kisaki St.	Farming	Livestock keeping	Business	
Gomero	Farming	Livestock keeping	Business	
Nyarutanga	Farming	Livestock keeping	Business	
Milengwelengwe	Farming	Livestock keeping		
Sesenga	Farming	Livestock keeping		
Magogoni	Farming	Livestock keeping	Business	
Kiganila	Farming	Livestock keeping	Business	
Bwira juu	Farming	Livestock keeping	Business	
Bwira chini	Farming	Livestock keeping	Business	
Kiburumo	Farming	Livestock keeping	Business	
Kongwa	Farming	Livestock keeping	Business	Fishing
Tulo	Farming	Livestock keeping	Business	Fishing
Kidunda				

Source: Survey data

Agriculture

Table 3.1 summarizes income sources from agriculture. Agriculture is the predominant activity of the Ukutu people. About ninety seven percent of the respondents are farmers (50.0%) or mixed farmers (6.7%) where they practice both farming and livestock keeping while others practicing farming and business (30.6%), Livestock keeping (9.7%) and; farming and beekeeping (7.2%).

Table 3.1: Main Occupation of the Head of Households

Activities	%
Farming	50.0
Farming and Livestock keeping	6.7
Farming and Business	30.6
Livestock keeping	9.7
Other	3.0

N=134

Source: Survey Data

Farming technology

Most of agriculture farming practice is rainfed. The cropping cycle follows the rainfall pattern of the area with the main growing season of both upland and lowland crops covering the period from late February early March to July/August. This is followed by second planting of upland maize in October timed to coincide with the short rains of November/ December, which is then harvested in late January. Rice, maize, and cassava are main crops grown in the village areas. Other crops include legumes, millet, sugarcane, mangoes and other fruits. Cattle are also relatively abundant, especially around Lukulunge and Tulo villages. Like in Idodi-Pawaga WMA, rice is produced both for food and cash. Cotton used to be the cash crop for the area, but this ended with the failure of the state-run cotton growers cooperative in 1989 with debts outstanding to many local farmers. From 1994 onwards farmers started growing sesame as a potential cash crop (GTZ 2001). However, sesame market is not very reliable. The only market available currently is Dar es Salaam. It is very difficult for farmers to get actual price for Sesame in Dar es Salaam market and the only source of price information is the traders who come to buy the crop. This partly affects their bargaining power. Prices for sesame

are said to be low and highly fluctuates. A variety of other vegetable and tree crops are also grown for mixed purposes of subsistence and trade. Tree crops such as coconuts and bananas are particularly valued on account of their potential as perennial source of supplementary income benefits.

Agriculture farming is characterized by poor technology of hand hoe, limited input use and shifting cultivation. Although, land availability for most villages visited seem to be not a problem at the moment, a high proportion of the villagers cultivate only 2-3 acres per household due to using hand hoe and inadequate labour force. Few inputs are used in the process, as only few minorities of the wealthier farmers can afford the cost of tractor hire. Similarly chemical pesticides and fertilizers are both expensive and difficult to obtain (GTZ 2001). Following the collapse of cooperative unions, a high proportion of peasant farmers cannot afford buying inputs on cash. The only option seem to be available for them to raise farm productivity is through shifting cultivation. After experiencing the drop of yields on his/her farms as a result of diminishing fertility he/she shift to a new or virgin land in hope to increase more yields from the natural fertility of the new area (URT 1991). According to villagers, production from virgin land is significantly high compared to the over-cultivated land. For example, in Bonye and Mb Wade villages, rice production can go up to 20 bags per ha in virgin land compared to 10-16 bags in the over cultivated land. Nevertheless, shifting cultivation leads to unsustainable agriculture and have negative impact on environment. Clearance of virgin land for agriculture leads to deforestation and enhances soil erosion and degradation. Shifting cultivation is also labour intensive as every time a farmer moves to a new area he/she needs to clear up the land by cutting down trees and other vegetation, the exercise which is laborious and time consuming.

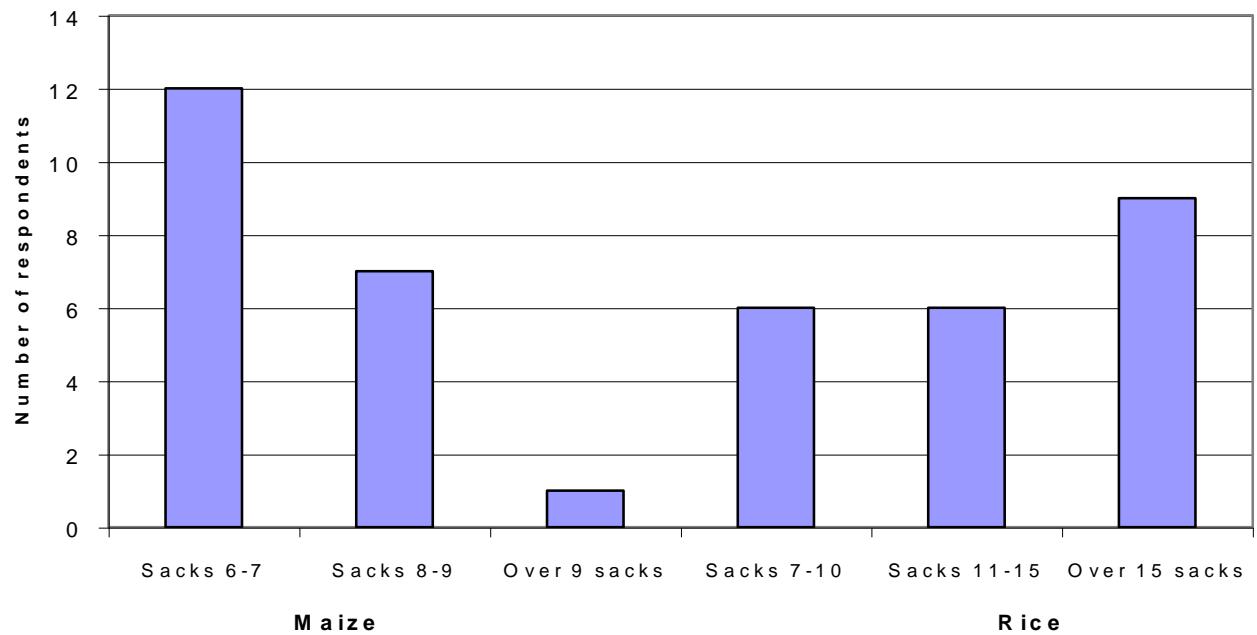
3.4 Production and Productivity Trends

Agricultural productivity is very low in most villages surrounding the Ukutu WMA. The average production per ha was reported to be 7.6 bags and 16 bags for maize and rice, respectively. The lowest yield were 6 bags of maize per acre in villages of Mngazi, Vigolegole, Gomero, Nyarutanga and Sesenga. Only two villages of Bwakila chini and

Dakawa had the highest yield of 10 bags/ha. The majority of the villages had a yield of 7-9 bags/ha (Figure 4.1). Out of the 21 villages visited only 7 (or 33%) had a yield of 20-25 bags/ha while majority having less than 15 bags per ha. This is significantly low compared to the Kilimo recommendations (URT 1991, p6), which estimates a yield of 50 bags and 47.5 bags for maize and rice, respectively. Also the yield trend shows a significant decline during the past 12 years. In 1990 yield for maize and rice under similar level of technology of to day, was 21 and 28 bags/ha, respectively URT (1991).

The reasons given for the declining yield trend includes poor soils, drought and poor farming technologies of hand hoe and low input use. Crop damage by wild animals also contribute significantly in reduction of yield. In some villages, wild animals damage were reported to account one third of the total crop production. In addition, post harvest crop losses are high due to poor storage facilities and techniques. Most of the villages in Ukutu WMA also have been worst affected by man-eating crocodiles. In 2001 JUKUMU Society received a share of Tanzania's CITES quota of crocodiles. This would have enabled the villages to reduce the crocodile population in some crucial areas and at the same time to derive some income from the sale of crocodile skins for export. However, up to the time of conducting this study, there was no action taken and crocodiles have remained a threat in the area.

Figure 4.1: Maize and Rice yield/ha (Sacks)



3.5 Livestock Keeping

Apart from agriculture farming practices, livestock keeping is also practiced mainly by the Wamasai. The livestock practiced include cattle, goats and sheep. Indigenous people, the Wakutu has no tradition of keeping livestock. A study by GTZ (2001) shows that only 3.5% of the respondents reported to have keeping livestock other than chicken. Livestock keeping provides milk, which the Masai sell to buy grains. Masai also sell few cows (about six) each year to buy other necessities such as cloth and medicine. Cattle are sold mainly in the open market or *magilio*.

3.6 Petty Trade

At least villagers are involved in petty business at one time of the year especially during dry season and is pursued as secondary occupations. A household survey show about 30% of the population to have been involved in petty business every year during dry season. The common business reported included shops, local brew clubs, tailoring, food

vending, restaurants, artisan, building, carpentry and milling machines. Businesses like guesthouses; milk selling, butcher, pharmacy and bar were only reported in few villages.

In all villages visited there was complains about inadequacy of shops services both in number and range of products offered. This is partly contributed by the remoteness of the area and bad roads, which makes accessibility to Morogoro town difficult. As result, villagers depend more on open markets (*magulio*), for buying goods, which is performed once per month for each village, or several villages together.

3.7 Natural Resources Use

Table 5.1 summarizes natural resource by villagers. Dependent on natural resource is high in the Ukutu WMA. Except for grazing grass where the population use is only 15.7 %, over seventy five percent of the respondents use the rest of the resources suggesting that natural resource plays an important role in people livelihoods. The type of natural resources use includes building poles, thatching grasses, medicine, grazing grass, fuel wood, food etc. Game meat consumption is also high in Ukutu WMA. This is partly occurs because villages receives their quota mainly for meat consumption. Also illegal game meat business is high. However, quantifying natural resource use was difficult because this resource is used mainly on subsistence levels. Also farmers do not have a tradition of record keeping and some of the business like meat selling by individuals is illegal and therefore cannot be disclosed.

Table 5.1: Use of Natural Resource by Households

Type of Natural Resource	%
Building poles	94.8
Thatching grass	86.6
Game meat	86.6
Medicinal plants	74.6
Grazing grass	15.7
Fuel wood	100 .0
Other	6.0

N=134

Source: Survey Data, 2003.

3.8 Per Capita Income Earnings and Sources at Households

Ninety-Two respondents (84%) of the 134 household interviews have a cash income of less than one dollar a day. Although dependency on natural resource is considerably high in Ukutu it is mainly on subsistence basis and as a result cannot easily be quantified in money terms. Income from natural resource related business (e.g fuelwood, charcoal, timber, artisan are all grouped as business incomes). Table 6.1 summarizes cash income earning categories by households

Table 6.1: Income Earnings Per Season by Households (%)

Income level (T.shs)	Proportion
Between 10000- 60,000	31.3 (42)
60,001-100,000	10.4 (14)
100,001-200,000	26.9 (36)
200,001-300,000	15.7 (21)
300,001-500,000	8.9 (12)
Over 500,000	6.7 (9)

N=134

Note: Figures in parenthesis indicate responsible persons

Source: Survey Data

3.9 Household Expenditures

The main source of expenditures by the households is consumable good, health and education.

Households spend their incomes on domestic goods such as sugar, kerosene, salt, cooking oils, cloth, hand hoes etc. Once again, the question on actual expenditure at household level was difficult since people do not keep records.

Many villages do not have health services and the few with them are lacking qualified personnel and drugs. Common diseases were reported to be Malaria, Dysentery, typhoid and Diarrhea. It was reported that at least three quarters of the villages suffer from malaria annually and a high proportion of this segment had a repeated malaria incidences of about 4-6 times per year and several persons in the household may fell sick of malaria. According to villagers, the minimum cost one can incur for treating malaria is Tshs 1,500 per illness or Tshs 6000-9000 per person per year. About eighty percent of the population fell sick of dysentery, typhoid and Diarrhea and the cost of treating these diseases is even higher. It was reported that some people have spent about 60,000/= for treating the diseases. Although, AIDS is a threat everywhere in the country, many villages Ukutu WMA were confident that AIDS was not much of a problem in their villages. However, high incidences of TB and Typhoid, which in most villages was reported to be 10% and 25%, respectively could be used as an indication of AIDS spread in the area. High rate of infection leads to reduced labour force and productivity in the household, increase poverty levels among rural communities and the cost of treating diseases is considerably high and is a burden to the household already meager budgets.

Parents also incur costs on education in terms of school fees, uniforms, books, contributions etc. According to villagers cost per primary school child is Tshs 50,000/= per year.

3.10 VG Incomes and Expenditures

Villagers source of incomes ranges from cess, fines, levy, contributions, donation and natural resources. However, a high proportion of income comes from wildlife mainly from annual quotas. The following section explains wildlife incomes in detail.

3.10.1 Incomes

3.10.1.1 Natural resource use

Income from natural resources includes mainly carpentry, fishing, charcoal, beekeeping, building poles, thatching grasses, minerals, timber and brick making. Although game meat business is widely practiced, many villages were not ready to mention or provide actual figures due to the fact that it is done illegally. Out of 21 villages visited, only two villages of Bonye and Mb Wade were open in this respect where about 200 persons in each village were reported to have been involved in bush meat business.

Mechanisms for natural resource use

In accessing natural resource there are some categories, which the permission for utilisation has to come from the District Wildlife Office or headquarters (e.g timber and bush meat business). Other categories, the village government has the mandate to provide permission with or without fee. Such resources include building, materials. While other resource such as fuelwood collection are extracted without seeking any permission. However, in most villages visited, it was reported that people do extract these resources (especially those under the village authority) free of charge because either the existing by-laws are not there or they are not enforced. Such uncontrolled natural resource use may lead to ‘tragedy of commons’, which will affect WMA sustainability and deny village governments from increasing incomes through wildlife utilisation.

3.10.1.2 The village wildlife quotas

The DW allocates an annual quota of animals to each village, which are then hunted on behalf of the village by District Game Scouts. No game fees are charged for those animals but the meat is sold amongst themselves at a price set by villagers. Each village

receives its own quota of wildlife for meat consumption. Money generated through the sale of meat is blanked by the Village Wildlife Management Committee. The community is involved in drawing up an annual budget and the money is spent on projects approved by the community. Bush meat is sold at a price of 400-700/= per kilo. Wild animals hunted include buffalo, wildebeest, eland, hartebeest, waterbuck, warthog, reedbuck, impala and bush pig.

Although, this low price intends to allow many villagers access the bush meat, it has never satisfied the demand of the villagers. Villagers were complaining that the meat supplied was not enough. Other complains by the villagers included receiving meat, which has gone bad due to transport problems, and that animals which are slaughtered are very small. Baldus *et. al.*, (2001) provides further overall explanations to the problem related to the quota allocation to Ukutu and other WMAs surrounding Selous Game Reserve in that:

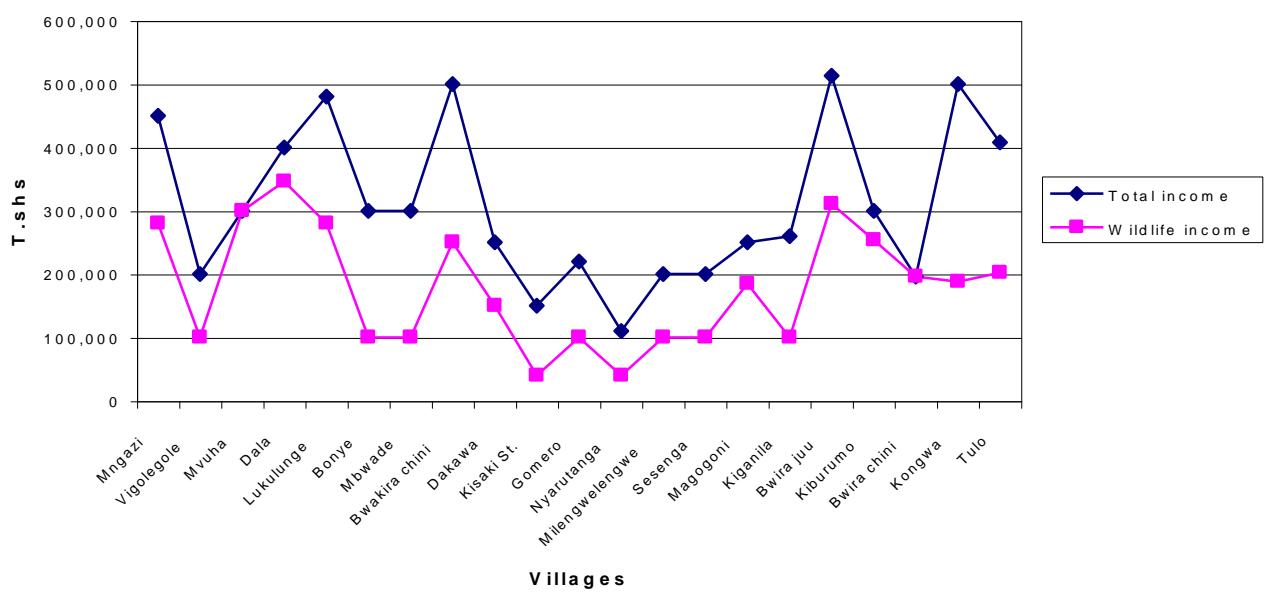
- The village quota allocation quite often is approved only after the start of the hunting season or not promptly forwarded by the regional authorities, effectively reducing the time available for hunting;
- Insufficient ammunition is always be obtained from the Wildlife Department (WD)
- Quota are sometimes reduced by the WD;
- In some occasions government scouts are unavailable to assist villages that have not yet received their gun licenses with hunting;
- Conflict with safari hunting companies that had been allocated a hunting block extending over the village land without prior consultation with village governments.
- Limited hunting skills of some village game scouts.

On the other hand, the very low prices offered for the game meat dealers may have the following consequences. They have the potential to increase demand by villagers surrounding the WMAs. This is because other protein sources such as beef and goat meat

are expensive compared to the bush meat. Beef and goat meat are sold at the price of T.shs 1000/= and 1500-2000/=, respectively. High demand for bush meat is likely to provide incentive for village poachers to kill more wild animals for the business. On the other hand, reduced demand for beef/goat meat due to high prices is likely to reduce prices of goat and cattle in the auctions. This will create disincentive for livestock keepers to sell their animals at low prices. This is particularly true for Livestock keepers who even at good price are reluctant to sell their animals. It would have been rational for the bush meat to be determined by market forces rather than the artificially subsidized rates.

An investigation of the sources of incomes for village governments surrounding the WMAs show that villages depend mainly on the ten percent of the development levy collected, cess collected from petty trade in the villages including agricultural products, penalties for violators of the by-laws and wildlife quotas. In addition to the quota, there is some wildlife money coming from JUKUMU. Like in Idodi-Pawaga WMA, income from wildlife appears to be significant in most of the villages visited contributing to over half of the village total incomes (Figure 6.1).

Figure 6.1: Proportion of wildlife income in total VG incomes



Source: GTZ (various survey); Field data (2003)

Income from wildlife per village in Ukutu for the past five years ranged from Tshs 200,000 to Tshs 728,000 per annum. Average income per village for the whole period was Tshs 456,886 (Table 7.0).

Important source of wildlife as ranked by villagers is as follows:

- Annual quota as allocated by the DW;
- Transfer of funds originating in the Wildlife Department's revenue from trophy hunting in and around SGR;
- Contribution from safari hunting companies operating in the proposed WMA;
- A lucrative long term lease contract between the JUKUMU Society and a photographic safari operator in Morogoro;
- Additional fees from lumber and fishing according to new village and district by-laws;
- A campsite of JUKUMU Society near to the proposed WMA in Morogoro District;
- Fines imposed on offenders according to the village by-laws.

Table 6.1: Money income from wildlife 1997-2001/2002

Village	1997/98	1998/99	1999/2000	2000/2001	2001/2002	Total	Average
Mngazi	872,109	248,231	395,712	297,012	280,000	1,813,064	453,266
Vigolegole	1,136,809	393,750	641,050	598,454	100,000	2,770,063	692,516
Mvuha	820,291	413,560	471,796	500,696	300,000	2,206,343	551,586
Dala					346,000		0
Lukulunge	775,072	347,494	175,000	189,000	280,000	1,486,566	371,642
Bonye	790,546	274,850	369,485	346,000	100,000	1,780,881	445,220
Mbwade		256,500	376,200	433,000	100,000	1,065,700	266,425
Bwakira Chini	933,521	261,331	434,521	433,766	250,000	2,063,139	515,785
Dakawa	847,546	230,750	398,792	422,692	150,000	1,899,780	474,945
Kisaki station	1,197,681	452,917	243,000	334,000	40,000	2,227,598	556,900
Gomero	1,278,531	633,911	438,411	561,000	100,000	2,911,853	727,963
Nyarutanga	852,705	383,309	391,040	256,040	40,000	1,883,094	470,774
Milengwele ngwe	993,165	191,300	395,750	447,800	100,000	2,028,015	507,004

Sesenga	993,456	238,950	216,260	211,000	100,000	1,659,666	414,917
Magogoni	699,571	160,220	369,600	435,600	185,000	1,664,991	416,248
Kiganila	823,882	130,000	231,900	280,000	100,000	1,465,782	366,446
Bwila juu	845,862	122,800	262,930	255,000	311,000	1,486,592	371,648
Bwila chini	739,721	57,000	327,600	220,000	254,000	1,344,321	336,080
Kiburumo					196,000	0	0
Kongwa	676,446	74,700	175,211	337,000	188,000	1,263,357	315,839
Tulo	515,946	81,000	28,500	180,000	202,000	805,446	201,362
Kidunda	297,275	471,150	106,030			874,455	218,614
Total	16,090,135	5,423,723	6,448,788	6,738,060	3,722,000	34,700,706	8,675,177
Average	846,849	285,459	339,410	374,337	177,238	1,826,353	456,588

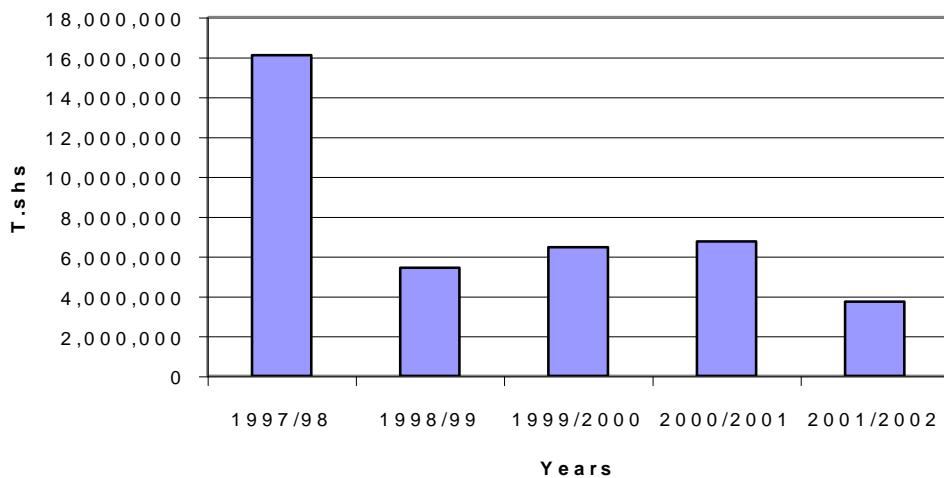
Source: GTZ (various surveys); Field data, 2003.

Income from wildlife and trend

Overall income for the Ukutu WMA declined sharply from Tshs 16,090,13 in 1997/98 to T.shs 5,423,723 in 1998/99, a decline by 61%. The revenue has remained low also in the years 1999/2000 (Tshs 6,448,788) and 2000/2001, (Tshs 6,738,060) (Figure 1) and year 2001/2002 recorded the lowest amount of money from wildlife (Figure 3)².

² The income for year 2001/2002 should be taken with caution. Unlike the previous 4 years where the figure were recorded from previous studies, the amount provided for year 2001/2002 was reported by the VG government during the survey period. In most cases the VG staff did not have reliable records rather it was based on their recalling capacity.

**Figure 6.2: Wildlife Income in Ukutu WMA 1997/98-
2001/2002 (T.shs)**



3.10.2 Village government expenditures

Normally, villages discuss and plan their natural resources management budget during the annual village Full Assemblies in order to promote transparency and information. The village natural resource committee is supposed to explain the income and expenditures from the previous year. Only the Full Assembly has the authority to approve the adherence to the proposed budget-line and the effective dealing with funds, as well as approving the budget plan for the following year. Nevertheless, field observation, shows that income and expenditure procedures are not transparent in some villages. Because of this, provision of data on this was quite problematic and very often led to hot debate between villagers and their governments.

The utilization of the income can be split up into three main categories as follows:

- Expenditure for the management and protection of the WMAs;
- Expenditure for village development activities, projects and administrative issues;
- Financial reserves.

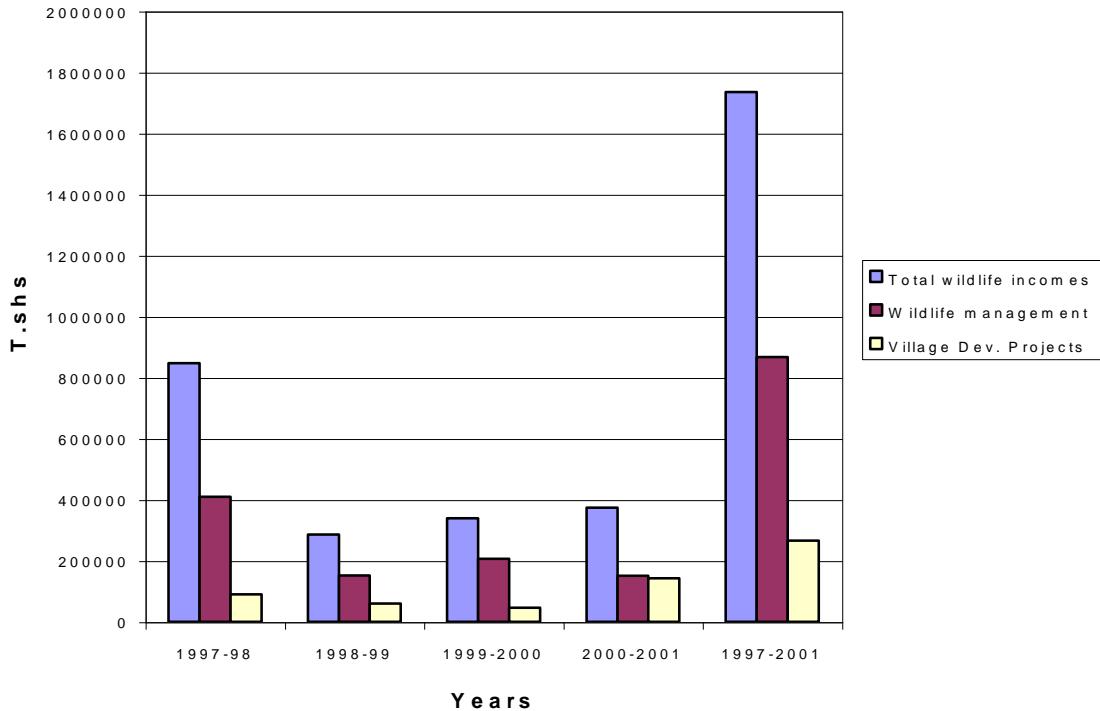
About half of the village incomes are used on the management and protection of their future WMA. The main expenditures for management and protection are:

- Allowances, food rations, medicine, uniform and other equipment for the village scout force;
- Ammunition to patrols, quota hunting and crop protection, and the annual license fees;
- Rental of transport or employment of casual labours during village quota hunting;
- Demarcation of the boundaries of the proposed WMAs;
- Office and equipment maintenance, stationary and bicycle repairs;
- Training of scouts and committee members;
- Reimbursement of travel costs for bank visits, participation in District Natural Resources Management Advisory Body and Full Council Meetings.

Expenditure for village development projects provide funds for the renovation and repair of communal infrastructure such as schools, dispensaries, water-pumps, roads etc. Funds are typically used for materials such as iron sheets, cement and craftsmen, whereas any unskilled labour is recruited from the respective village on a voluntary basis. Also several villages were reported to have used money for buying drips for patients in health centers especially people suffering from malaria, diarrhea and dysentery. The three diseases are chronic in the area. Although, no figure was provided, a considerable proportion of money earned from wildlife by the village governments is used for administrative matters including meetings and attending to guests.

The amount of money spent per village for management and protection ranges from about T.shs 0 to just over T.shs 300,000 while money channeled for village development projects has been insignificant during the past five years ranging from as little as T.shs 3,750 to about T.shs 167,000 (Figure 3).

**Figure 4.0: Wildlife income and expenditure 1997-2001
(T.s hs)**



Source: GTZ (various years); Field data (2003)

Proportion of expenditure between Wildlife protection and development projects

Proportion-wise, 50% of the income for the past four years (1997/98-2000/2001) has been used for the management and protection compared to as little as 15% for village development (Table 5.0). It is not clear as to whether the remaining 35% is saved in banks or used for recurrent expenditures.

According to Hahn and Kaggi (2001), the expenditure correlates closely with the income generated from the sale of meat since is the only source considered reliable by most villages. Also the study reveals that contributions from other sources are often paid out late in the budget year and are then transferred to the villages' bank accounts. Nevertheless, allocation for village development projects needs to increase if the objective of reducing poverty in the WMA is to be achieved. Increasing money for development projects is perhaps the major incentive for villagers to feel sense of

ownership for these WMAs and this in return may become incentive for them to cooperate in protecting WMAs against. Table 8.0 summarizes proportion of income used for Conservation and Village development

Table 6.3: Proportion of Income Used for Conservation and Village Development

Villages	Money income	Management Protection expenditure	Village Development	Percentage expenditure on management protection	Percentage expenditure on village development
Mngazi	1,813,064	890,773	258,200	49	14
Vigolegole	2,770,063	1,138,292	268,070	41	10
Mvuha	2,206,343	1,237,944	383,100	56	18
Dala	0	0	0		
Lukulunge	1,486,566	675,482	233,000	45	16
Bonye	1,780,881	1,111,622	161,600	62	9
Mbwade	1,065,700	1,030,222	333,900	97	31
Bwakila Chini	2,063,139	977,297	572,460	47	28
Dakawa	1,899,780	931,432	402,860	49	21
Kisaki station	2,227,598	1,235,192	243,500	55	11
Gomero	2,911,853	1,285,142	667,000	44	23
Nyarutanga	1,883,094	1,091,202	156,000	58	8
Milengwelengwe	2,028,015	1,080,342	420,500	53	21
Sesenga	1,659,666	883,172	255,200	53	15
Magogoni	1,664,991	765,877	173,000	46	10
Kiganila	1,465,782	655,152	195,550	45	13
Bwira juu	1,486,592	678,042	161,130	46	11
Bwira chini	1,344,321	548,942	67,400	41	5
Kiburumo	0		0		
Kongwa	1,263,357	531,342	114,000	42	9
Tulo	805,446	302,842	15,000	38	2
Kidunda	874,455	285,030	245,000	33	28
Average	1,735,035	866,767	266,325	50	15

3.11 Markets for Farm Products

There are few farmers who trade in rice, maize and sorghum staple crops on a commercial scale for the Morogoro market. A high proportion of farmers sell their farm products locally either to the traders who come to buy crops or among the farmers themselves. Almost all the visited villages were complaining about poor marketing system. Although, traders come into large numbers to buy farm crops, they offer very low prices. This situation might have caused by among other things low bargaining power of farmers relative to traders. The collapse of cooperative unions has left farmers with no representative organization to co-ordinate their production, negotiate prices with buyers and campaign for better support services. Lack of market information is another factor affecting bargaining power by farmers. Most farmers do not have price information from other sources than the traders themselves. Due to lack of quality price information, farmers have quite often realized that same trader who bought their produce paid different prices to different farmers for the same quality of produce and at the same time. One important role the government could play in these liberal markets could be to improve access to price information by farmers so that it discriminates less against small farmers and consumers.

On the other hand, high transport costs are another reason for farmers receiving low prices for their farm produce. As pointed out, the roads are in bad condition and some are not passable during rainy season. Investigation from the field show that most farmers pay between T.shs 3000 – 4000 for a return trip to Morogoro town and T.shs 1500-2000 for a bag of 90 kgs of any farm produce. The high transport costs is undoubtedly reflected in producer price. Price per sack of maize ranges from T.shs 4,500 to 24,000/= during harvesting and scarcity, respectively, while it is 4,200 to 12,000 per sack, respectively.

3.12 Economic Agents

There are two economic agents in Ukutu WMA. The SEBO Tourist Tented Camp and Gonabis/Kidunda Intercon Adventures Safaris. The SEBO camp is outside Selous Game Reserve. It works with JUKUMU Society in the sense that it has rented on JUKUMU society's area. It recruits most of the unskilled labour locally both temporary and permanent. The investors are reported to provide humanitarian assistance in case of disaster or diseases outbreak such as Cholera, where they can provide drugs, water, drips etc. SEBO camp also pays bed rates that ranges from US\$ 210 to US\$ 2835 per month depending on the number of tourists received (*Kaseke, pers. Communication*). Furthermore SEBO tented camp pays a total of US\$ 700 per annum to JUKUMU Society as renting fee. The Gonabis/Kudunda Intercon Adventures Safaris was not approached for discussion due to time constraints.

There is also a facilitator/donor the Evangelical Lutheran Church of Tanzania (ELCT), which has donated funds for health center construction in Magogoni village. This is a cost-sharing project where the local communities are contributing in kind through providing labour power.

3.12.1 Interactions between economic agents and local people

Following interviews with villagers there is no direct link between these economic agents and local people in the area. Although, villagers might be getting some incomes as commission/fee paid to the government authorities by investors which is then partly channeled back to the local communities in the area, their role to villages are not yet known. Villagers as government are not involved whatsoever in these investments although some individuals are getting employment both skilled and unskilled. It is clear that there is no any sort of joint venture that exists in the villages visited.

3.13 Financial Facilities

Formal financial credit is not available. Instead people rely on informal credit, which is limited to few thousand shillings. The repayment is both in kind or cash. High transaction cost related to formal credit both for lenders and borrowers limits the establishment of these institutions in rural areas. Also low money circulation and lack of collateral for rural communities creates disincentives for financial institutions to provide services in these areas.

3.14 Poverty Levels

According to the National Poverty Eradication Strategy (1998), poverty can be defined as a state of deprivation prohibitive of decent human life. In thus it includes both inadequate income as well as deficiencies in non-income human development attributes. The key dimension of poverty identification are (i) inadequate income to purchase basic necessities, (ii) deficiency in human capabilities (illiteracy, malnutrition, diseases etc) (ii) isolation and vulnerability (social exclusion and dependency) and (iv) powerless and hopeless.

At national level in defining poor and non poor the following indicators has been used. Rates of morbidity and mortality, prevalence of malnutrition, illiteracy, infant and maternal mortality rates, life expectancy, housing standards, clothing, per capita income, and expenditure, infrastructure. Other include fertility, lack of access to basic services such as safe water, food security, and technology.

In this study poverty assessment did not go into this sophisticated kind of definition mainly because of the limited time and resources. Instead the poverty levels for the villages surrounding the Ukutu-JUKUMU proposed WMA was assessed by using a PRA techniques where the villagers were asked to list criteria for defining wealth/ poverty among themselves. Although the criteria for defining wealth by villages were almost similar in all villages, there were differences in terms of quantity. For example in some

villages ability to cultivate at least 5 acres was an indication of wealth while others were saying at least 50 acres of cultivated land (Table 9.0).

Following PRA wealth ranking criteria, people in Ukutu are judged as rich or poor depending on the number of cattle, shops, tractors, cultivated land, milling machine, cars. The perception of modern house as an indicator of wealth varied from one village to another. While a high proportion of villages visited feel a modern house as an indication of wealth, others did not agree with this description by arguing that some people have managed to build modern houses out of severe budget constraints and sacrifices while others argued that only modern houses in urban areas should be taken as criteria for wealth ranking because from such an investment you are able to get good money out of renting. This was common among the Wamaasai dominated villages.

Table 9.0:Criteria for wealth ranking

	Magen ge	Tractor	Transport	Milling machine	Modern house	Able to cultivate (acres)	Food selfsufficie ncy	Shops	Cash saving	Proportion of poor people %`
Mngazi	1+	-	-	✓	1+	10+	✓	1+		75
Vigolegole	1+	-	-	✓	1+	10+	✓	1+		75
Mvuha	-	-	-	✓	✓	5+	✓	-	200000/=+	60
Dala	-	-	-	✓	✓	5+	✓	-	200000/=+	70
Lukulunge	-	-	-	✓	✓	5+	✓	-	200000/=+	75
Bonye	-	-	✓	✓	✓	-	✓	✓	300,000/=+	95
Mbwade	-	-	✓	✓	✓	-	✓	✓	300,000/=+	95
Bwakira chini	-	-	-	✓	✓	-	✓	-	200000/=+	100
Dakawa	-	-	-	✓	✓	-	✓	-	200000/=+	95
Kisaki St.	-	-	-	✓	✓	50+	✓	-		60
Gomero	-	-	-	✓	✓	50+	✓	-		65
Nyarutanga	-	-	-	✓	✓	50+	✓	-		75
Milengwelengwe	-	-	-	✓	-	-	✓	✓	400,000+	75
Sesenga	-	-	-	✓	-	-	✓	✓	400,000+	75
Magogoni	-	1	✓	✓		20+	✓	-	1000000+	90
Kiganila	-	1	✓	✓		20+	✓	-	1000000+	90
Bwira juu	-	1	✓	✓		20+	✓	-	1000000+	91
Bwira chini	-	1	✓	✓		20+	✓	-	1000000+	91
Kiburumo	-	1	✓	✓		20+	✓	-	1000000+	85
Kongwa	-	-	-	✓	✓	-	✓	-	-	85
Tulo	-	-	-	-	✓	-	✓	-	-	85

Nevertheless, despite the different definitions of wealth and poverty by villages, poverty levels for the villages surrounding the Ukutu WMA is high in absolute sense. A high proportion of over 80% of the villagers were reported to be poor with very few appearing to be better off among the villagers. This number might increase when one compares with the standard indicators of poverty (national and international) such as access to health services, education, life expectancy, under five mortality rate and access to clean water.

The poverty levels were also revealed in terms of food consumption patterns. Although people appeared to have wide range of food consumption patterns, food composition is dominated by starch with very little protein sources. Many villagers have two meals a day i.e lunch and dinner, which is reduced to one meal during lean seasons. The few with three meals a day were reported to be the civil servants and surprisingly many villagers regard them, as they comprised the wealth category of the villagers.

3.15 Economic Potential for Ukutu WMA

Field observations show large differences to exist between various districts and even between villages within the same district. This variation is caused not only by climatic, cultural and education differences but also influenced by the different potentials of the WMAs, the time span of cooperation with the SCP and the quality of leadership in different levels (Hahn and Kaggi 2001). In addition, socio-economic infrastructure such as roads and working facilities are different from one place to another. It is therefore our anticipation that the economic opportunities will not be applied equally by all WMAs. Rather comparative advantages should determine which WMA should do which activity. That is, each WMA or village (within the WMA) should concentrate/specialize in activities, which they feel to have comparative advantage. In this regard, comparative advantage and project appraisal should be done WMA by WMA to assess the viability and areas of specialization. Ukutu WMA comparative advantages could be studied in the following activities:

3.15.1 Optimal use of wildlife quota

Many villages in Ukutu WMA reported the underutilization of their wildlife quotas and poor selection of animals as the major factor denying both their meat and incomes. As a result, they do feel that a proper utilization of their quotas should be one of the potential areas to boost their economies. These findings are consistent with those of Hahn and Kaggi (2001) who reports that.... “most villagers’ regard legally obtained bush meat to be the primary benefit of the community wildlife management programme”. The villages argued that in most cases only 25% of the quota allocated is utilized thereby denying village government incomes and access to bush meat. Villagers also complained that the killed animals are of small sizes (young animals) and sometimes the meat reach them while gone bad which, as a result, do not fetch good prices. Thus, proper utilization of village quota will lead to the following advantages; provide adequate protein in this area where the demand is high. Access to other protein sources such as fish and domestic animals is limited due to limited water bodies and tsetse infestation, respectively. Also addressing demand for meat could win support to the village communities in sustainable utilization of wildlife.

3.15.2 Hot spring

Villages explained that on the western side of Kisaki Kituoni village there are hot springs. This is regarded as a natural gift and is treated as a sacred place where elders offer sacrifices or pray for rain or blessings in case of any bad outcomes within the village. During the uhuru railway line construction, the Chinese constructed water through where the spring hot water scattered over 2.5ha, was collected (URT 1991). From that point the water was pumped to reservoir tank and used for domestic purposes. Chinese enjoyed hot baths/showers from the hot springs but after they accomplished the construction work they demolished all structures (URT 1991). With good study and management the villagers can enjoy sulphur baths, which is recommended for healthier body skin. Villagers should protect this natural heritage for the betterment of the future generations but also providing economic and cultural gain. This could be achieved through villagers getting access to the area for ritual whenever the need arises, while allowing tourists/visitors viewing the area without any problems.

3.15.3 Tourist and Resident Hunting

The sale of quota based hunting rights to tourist hunting companies and/or resident hunting present the most immediate, and supposedly the principal, economic opportunity for the WMA. Hunting has the advantage of generating considerable revenues right from the beginning with little or no investments needed by the AA. The resource is already presented and available for operation. Hunting can generate profits early that communities can and should reinvest into the other economic opportunities. For hunting tourism to be sustainable, consumptive use of wildlife should not jeopardize the biological and ecological basic requirements. This could be achieved through the systems of monitoring the game populations, and must be jointly developed and implemented by the WD and the AAs along with the system of enforcing quotas.

3.15.4 Photo-tourism

Photo tourism is another opportunity for income raising in Ukutu WMA. The short grass plains and high densities of wildlife in the Gonabisi region is suited for photographic operations. Morogoro is believed to have longer term potential to generate income up to US\$ 36,000 per annum in the community from photographing (MNRT 1996). The only limitation to photo tourism is access, the area is almost completely cut off reach during the rain season by the Mgeta river in the South. Also incompatibility with the hunting tourism. Such a problem could be overcome by developing General Management Plans and zoning WMA for different activities. Christopherson et. al., (2000), proposes for example to extend buffer zone around national parks from one kilometer to 5 kilometers. Where a WMA is situated directly adjacent to a national park a small area of 5km wide buffer zone around national parks could be zoned for limited photo tourism. In this respect, photo safari companies could have small-tented camps located well inside such extended buffer zones, whose guests remain inside the small-gazetted photo tourism area and only access the camps through the park and only venture inside the park or protected area. These small-gazetted areas would have to be off limits for the hunter. To avoid conflicts between the two operations, conditions for hunting and photo safari companies should be clearly spelled out in the lease contracts and be in compliance with the

Tanzania law. Also tented camps should not be too many in the buffer zone to avoid hindering the movement of the game between the protected area and the WMA hunting block.

3.15.5 Sport hunting

Sport hunting could be potentially another major earner of revenues in the WMA. A report by MNRT (1996), estimates such an activity to generate revenue up to US\$ 40,000 per block per annum for surrounding communities in the SGM buffer zones. The study also proposes that for such activity to be efficient market forces should be allowed for allocation and pricing of hunting blocks.

The issue of increasing supply of meat for community surrounding WMA could also come from meat recovery from sport hunting. The great deal of the meat arising from sport hunting operations in the Selous is presently wasted, for various practical reasons (MNRT 1996). Given the nutritional status of the surrounding communities, this could help significantly.

3.15.6 Game cropping

Although hunting is more financially attractive for villages under WMAs, a high proportion of the villages visited showed a high desire for meat supply from the WMAs. Indeed, the issue on how they could maximize their meat intake from the quota provided by the government came over and over again during our survey. A fact is that rural communities living in WMAs have traditionally hunted wildlife as a source of protein although it is illegal. Thus, commercial harvest of wildlife for meat, hides and other products could be another consumptive economic opportunity in the WMA. Cropping of species such as hippo and zebra will generate additional revenue for the communities. However, cropping need to be done within ecologically sustainable limits or quotas. It should be used as mechanisms to ensure that certain species of wildlife do not exceed the carrying capacity of their habitat. Game Cropping for fresh meat in remote areas ,however, presents logistical challenges and may not be practical. Cropping for dried meat is much more realistic, although this would not fetch nearly the revenues that fresh

meat would. Quality dried meat or “biltong” on the other hand could be developed as specialty product fetching much more attractive prices but this would be new and untested activity in Tanzania and therefore unless thorough studies have been conducted, there is risky of undertaking the business .

3.15.7 Live animal capture and sale

This activity AA could be receiving quota from WD to capture and export live animals. The AA could consider this option along with the hunting and cropping options or some combination with the three. Quotas for capture and sale of non-game animals (reptiles etc) could also be established for WMAs.

3.15.8 Bee-keeping

Bee-keeping and the value added processing and marketing of honey, wax and other products, presents a clear economic opportunities for most villages in Ukutu WMA both at village and household levels. Despite its potential, bee-keeping business is underdeveloped in Tanzania where less than 4% of the potential volume of honey is produced nationally (MNRT 2000). Currently, only few villages practice bee-keeping in poorly organized, the quality of honey produced is low and sold locally at low prices Therefore, improving processing and marketing presents a natural resource based business opportunity for the AA of the WMA compatible with all other economic opportunities. Bee-keeping will play a multiple role in that apart from bringing income through honey and wax selling, will contribute substantially to the regeneration of the natural forests, complementary to the National Forest Management Programme.

3.15.9 Fisheries management

In addition, villagers suggested of boosting fishing as another source of income. Despite the existence of many rivers in the area, fishing activities has remained low and provides little economic gain to the villages. Boosting fishing also will provide a diversification source of protein. Currently villages depend mainly on bush meat and chicken as major sources of protein and this could affect sustainability of the wildlife in the WMA.

Fisheries management requires empowerment of the local communities in the control over the resource, the development of the rules regulating net size, type of equipment used, the protection of spawning areas etc and a system of enforcing the rules (Christopherson et. al., (2000). It also provides opportunities for the AA to invest in value-added processing (smoking, drying, refrigeration) and marketing. In this context, it would also link to the NFM component to ensure a steady supply of fuelwood.

3.16 Emerging Issues

Based on the above findings and field visits the following are the emerging issues observed:

- Level of knowledge and awareness regarding these new concepts of WMA and AA by villagers including village governments is very low or non-existence. This may affect local communities bargaining power relative to investors and joint ventures related business.
- Natural resource use by villagers is considerable but difficult to quantify and to put in money terms because is used mainly on subsistence levels or extracted illegally.
- Most of the natural resources is extracted free of charge because either by-laws are not developed or they are not enforceable.
- The capacity to keep records for incomes and expenditure by households as well as village governments is very poor and in some villages not transparent enough.
- A good proportion of the VG incomes seem to have been used in administrative matters rather than villages' development projects.

- Capacity to identify economic opportunities for their WMA by villages is low which may undermine their bargaining power with investors.
- The benefits accruing from WMA are likely to benefit the community rather than individual households especially in the initial years of implementation. Families that depend on natural resource for subsistence may suffer following WMAs implementations.
- The efficiency in running economic activities is likely to differ from one WMA to another depending on comparative advantages.

3.17 Conclusion

Administratively, Ukutu WMA has made a good progress. It has CBO; the JUKUMU Society and natural resource committees have been established in each village. However, the poaching incidence has remained high. One of the reasons is lack of working facilities including communication, transport and guns.

There are two economic agents, the Sobo tented camp, and Intercon Adventure Safaris, which conducts hunting business. However, according to the villagers there is no link whatsoever between local communities and economic agents in their areas. Information from the investor as well as DW indicates provision of some cash and humanitarian assistance from the investor to the village governments.

Income from wildlife has remained low due to partly the quota system, which is given to each village. Due to various reasons many villages cannot utilize fully the quota allocated. The major problems mentioned includes the delay in getting the quotas, lack of professional hunters, transport, inappropriate hunting techniques etc. Also the artificially subsidized low price for bush meat has had negative impact on both income and meat consumption by villagers. Low prices for bush meat has increased demand by villagers, which cannot be met by the limited supply. Consequently, there has been a lot of

complains among the villagers. But also low prices for bush meat is likely to have negative impact on livestock sector in the villages surrounding the WMA. Due to high price of beef/goat meat demand for these products will decline in return causing prices for selling cattle/goats to decline accordingly. This will create disincentive to sell animals by livestock keepers thereby creating more pressure on grazing pastures. On the other hand, high demand of bush meat by villagers will be a good incentive for killing more wild animals by poachers.

Incomes and expenditure by village governments are not clear and transparent enough. Also in many villages, very low proportion of the income earned from wildlife is used for development projects.

Crop destruction by wild animals is considerable in all villages visited. This affect villagers' crop harvest and incomes. Wild animals also have been destructive to livestock where several have been killed. On the other hand, impact on human beings have been reported where few people have lost their lives or disabled by wild animals especially Crocodiles.

Due to similar ecological background, the economic opportunities are likely to be similar in all WMAs. However, the efficiency in running these economic activities is likely to differ from one WMA to another depending on different reasons including wildlife richness, type of wildlife existing, infrastructure, knowledge and experience in conservation.

3.17 Recommendations

There should be immediate and extensive awareness raising programme by villagers surrounding the WMA and capacity building in WMA, AA and general managerial skills for the key players of the VG. This task needs to be implemented by the MNRT in collaboration with local authorities.

There should be trainings for VG in record keeping for incomes and expenditure. Also there should be external board to audit VG incomes and expenditures.

The MNRT need to contract a firm to undertake detailed study in all WMAs case by case to establish economic efficiency based on cost benefit analysis and comparative advantages. This is important for each WMA to operate in areas, which it is more efficient and competitive. Comparative advantage could be in terms of wildlife resource endowment, transport advantage, time invested in the business etc.

While it is appreciated and more democratic for villages to plan how to utilize natural resources based on the guidelines and regulations developed, ecological as well as economical advice should be provided to the villages to help them reap the best out of the wildlife resource. For example, while many villagers have shown a desire of increasing bush meat supply from the wildlife, experience shows that this is the most inefficient way of utilizing wildlife both logically and economically. Therefore, the alternative way could be selling the entire quota to the tourist hunters. Part of the income from quota system should be used to buy several cows/goats for villagers' meat.

Where the losers from these new policies (in terms of natural resource extraction) appear to be significant there should be compensation e.g providing alternative livelihood activities. This is important for WMA sustainability.

3.19 Way forward

The most deficiency gap observed in the field is the knowledge and awareness about the whole idea of WMA and AA by villages. With exception of the villages' chairmen who attended the inauguration ceremony by the MNRT in Dar es Salaam, a high proportion of the villagers including VGs' staff do not know exactly what is going on and how this, is going to affect their socio-economic lives. Therefore, awareness raising for the whole community surrounding WMA and capacity building for key players in the VG should be the starting point of WMA implementation by the government, donor community and

NGOs. Educating villagers on the concept WMA and associated packages is also important for bargaining power with investors. Education also should be extended to teaching people basic principals of project appraisal and book-keeping or general management practices. Field observation shows that VG cannot keep even simple records for income and expenditure for the villages. Proper monitoring of the impact of WMAs concept will only be possible if there is proper record keeping in villages.

Help villages to develop by-laws for natural resources utilization as an incentives to increase VGs incomes and sustainable utiulisation of natural resource and provide incentives to enforce the by-laws.

Since most of the villages also do not know even how they could increase their incomes based on this new WMA policy, facilitators may be required to help them in identifying and implementing economic opportunities at least during the initial stages of implementation.

Table 3: Crop Productivity and production trend

Village	Maize (in sacks)	Rice (in sacks)
Mngazi	6.0	7
Vigolegole	6.0	7
Mvuha	8	12
Dala	9	15
Lukulunge	9	13
Bonye	9	8 (20 in virgin land)
Mbwade	9	9
Bwakila Chini	10	18
Dakawa	10	18
Kisaki station	9	12
Gomero	6	11
Nyarutanga	6	12
Milengwelengwe	7	9
Sesenga	6	9
Magogoni	7	25
Kiganila	7	25
Bwira juu	7	25
Kiburumo	7	25
Bwira chini	7	25
Kongwa	8	20
Tulo	7	20
Total	168	350
Average	7.6	15.9

4.0 ECOLOGICAL ASPECTS

4.1 *Situation Analysis*

The proposed WMA is 750 sq.km. The area is managed by 21 villages. The proposed WMA and surrounding villages have been surveyed and mapped by UCLAS, the former Ardhi Institute (see Map 1).

JUKUMU Society is quite advanced in the management of wildlife and they seem to be quite prepared for managing a WMA. The institutional arrangement available and the level of awareness give high hopes for effective management of wildlife by communities.

4.2 Ecological Data and Analysis

4.2.1 The current ecological status of the area

The proposed pilot WMA consists of 2 blocks. The western block has a common border with Mikumi National Park while the other borders the SGR. The area bordering the SGR, especially Gonabisi, has abundant wildlife. The most common species include zebra, hartebeest, impala, waterbuck, eland, Reedbuck, giraffe, lion and elephant. Less common species include sable antelope, hippo and leopards.

The area largely remains under natural vegetation-mainly *Acacia-Combretum* open woodland. A large population of buffalo, wildebeest, impala and reedbuck are found at high densities on the grasslands of the Gonabisi Open Area between the Mgeta and Ruvu confluence.

The proposed pilot WMA is ecologically important because it is borders the largest protected area in Africa, the Selous Game Reserve (SGR). SGR is a refuge to some of the largest elephant populations and black rhino, buffaloes, crocodile and wild dog. 70% of Tanzania's elephants are in the Selous. The proposed WMA is therefore not exception to these ecological strengths. Elephants seem to be playing a pivotal role in the area. They break down and push over trees and shrubs, often transforming relatively dense woodlands into more open wooded grasslands with scattered tall trees, low-lying shrubs and resprouting trees.

4.2.2 Trends and use of wildlife

Trends in wildlife populations

There seem to be no proper surveys done specifically for the area. The trend in wildlife populations is therefore uncertain. However, based on the vast knowledge of the village game scouts, the estimates of wildlife numbers in Table 9 were made based on known groups of species available in the proposed pilot WMA in the dry season of 2003.

Table 9: Estimated Number of Wildlife in the Dry Season -2003

Species	Number of Known Groups and Estimated Number for Each Group	Total	Estimated Number
Buffalo	6 groups @ estimated at 400-500		2,700
Lion	-		40
Elephants	3 groups @estimated at 20-30		75
Zebra	10 groups @estimated at 60-80		700
Giraffe	-		300
Wildebeest	-		4,000-5,000
Eland	3 groups @ estimated at 30-33		94
Impala	2 groups @ estimated at 25-30		55
Gazelles	15 groups @ estimated at 30-40		525
Leopard	-		15-20
Waterbuck	5 groups @ estimated at 15-20		92
Reedbuck	-		2,000 – 3,000
Hippopotamus	-		30-50

Despite the fact that there are no proper records, there is a general consensus among communities that the number of elephants, zebra, wildebeest, gazelles, buffalo, and reedbuck is increasing in the area, while that of impala and leopard is decreasing. There are no proper reasons given for the declining numbers of impala and leopard. However, for the species whose numbers are increasing, communities are attributing that to improve security especially after empowering communities to manage wildlife.

It was also reported that there is a problem of over-utilization of certain species by one of the hunting companies in the proposed WMA and in SGR. This situation

poses potential risks of decline in wildlife numbers. Lion is among the species that is claimed to be declining in numbers because of this problem.

It is also claimed that the number of crocodiles has increased dramatically in the past few years. Though this is considered ecologically positive, but from the community perspective this has created problems because of increasing cases of human killings and attacks. Communities claim that there is little control by the wildlife division, and this has been the main source of the problem.

Endemic, Rare, Threatened and Endangered Species

There are no species of large mammals which are known to be endemic to the area. In terms of conservation status, the African Elephant is classified as Endangered and is placed in CITES appendix 1. Leopard is also classified as endangered and is in the same CITES classification. Hippopotamus and crocodiles are classified in CITES appendix 2. Among the group of cats, the lion and leopard are regarded as vulnerable.

Small Mammals, Amphibians and Reptiles

There is no documentation on the status of small mammals, reptiles and amphibians in the area. A detailed study on these animals is therefore required. Though there are no studies conducted so far, a general habitat assessment made indicate the following threats:

Threats to Amphibian Biodiversity:

- Natural threats such as long term climatic changes, which might cause droughts longer than those to which the species are adapted
- Uncontrolled burning of the vegetation, which might destroy dry season refuge
- Changes to the water flow regime in the permanent swamps, which might reduce the populations of those species most dependent on permanent water.

Threats to Reptile Diversity

Several species of reptiles believed to be in the area are placed on CITES Appendix 2 because they are regarded as being under threat from the live animal export trade (tortoises, chameleons, pythons and crocodile). Pythons are feared and killed as they seem to be a threat to smaller stock. Most snakes are also regarded as dangerous and are killed when encountered.

Use of wildlife

The main form of utilization is tourist hunting. For the past few years, the JUKUMU Society has been enjoying a hunting quota of 3 buffaloes and 10 wildebeest for each village. For 21 villages therefore it means each year a hunting quota of 63 buffaloes and 210 wildebeest is allocated. Apart from allocated quotas for buffalo, wildebeest and gazelles, in 2000 the community applied and received a license to sell crocodile skins, and were designated a quota to hunt 40 per year. Due to difficulties of hunting crocodile only four skins were sold in 2000. In 2001 16 crocodiles were killed and 14 skins were sold. JUKUMU obtained a trophy dealers' license which enabled them to market game meat outside the project villages. Unfortunately, the community did not receive a renewed license in 2000 because they failed to show profit from the 1999 sales. The villagers are also allowed to harvest a quota of game for their own consumption.

Table 10a: Supply of Game Meat for Villages (1991/92-1993/94)

VILLAGE	YEAR 1991-92				YEAR 1992-93				YEAR 1993-94								
NO. OF	PERCENT	QUOTA	KG OF	NO. OF	PERCEN	QUOTA	KG OF	NO. OF	PERCENT	ANIMALS	FULFILL	SOLD	ANIMALS	FULFILL	SOLD	ANIMALS	FULLFILL
		ANIMALS	FULFILL			ANIMALS	FULFILL										
Kisaki Station	8	88.8	400	4	44.4	554	8	62									
Gomero	8	88.8	400	4	44.4	522	8	62									
Nyarutanga	7	77.7	400	4	44.4	480	7	54									
Sesenga	4	44.4	300	2	22.2	409	4	31									
Mlengwelengwa	7	77.7	300	3	33.3	369	4	31									
Vigolegole	10	111	500	3	33.3	393	6	46									
Mngazi	7	77.7	340	3	33.3	407	8	62									
Dakawa	7	88.8	300	4	44.4	394	8	62									
Bwakirachini	8	100	280	4	44.4	342	7	54									
Bonge	9	100	430	3	33.3	415	5	38									
Mbwade	9	88.8	400	3	33.3	441	10	77									
Tulo	8	88.8	145	2	22.2	120	10	77									
Kongwa	8	77.7	200	-	-	-	-	7	54								
Mvuha	7	-	105	4	44.4	240	5	38									
Kiganila	-	-	-	-	-	-	-	8	62								
Bwilajuu	-	-	-	-	-	-	-	6	46								
Bwilachini	-	33.3	-	-	-	-	-	6	46								
Magogoni	3	77.7	110	2	22.2	120	5	38									
Lukulunge	7	-	200	2	22.2	120	6	46									
Kidundo		65	-	-	-	-	-	8	62								
TOTAL	117	13	4850	47	26	5326	136	52									

Table 10b: Supply of Game Meat for Villages (1995/96-1997/98)

VILLAGE		YEAR 1995/96		YEAR 1996/97		YEAR 1997/98		
		NO. OF ANIMALS	PERCENT FULFILL	QUOTA	KG OF MEAT	NO. OF ANIMALS	PERCENT FULFILL	
				PERCENT SOLD	ANIMALS	PERCENT SOLD	ANIMALS	FULLFILL
Kisaki Station		6	46	475	13	100	838.4	11 85
Gomero		7	57	586	12	92	617	13 100
Nyarutanga		7	57	505	12	92	510	7 54
Sesenga		6	46	625	8	61	322	10 77
Mlengwelengwa		7	57	530	14	107	430	11 85
Vigolegole		7	57	650	11	84	641.5	10 77
Mngazi		7	57	583	10	76	326	9 69
Dakawa		8	61	549	13	100	495	11 85
Bwakirachini		5	38	320	10	76	435	12 92
Bonge		11	84	618	13	100	928.4	14 108
Mbwade		11	84	385	10	76	646.4	5 38
Tulo		1	7	52	5	38	-	- -
Kongwa		1	7	-	7	54	541	9 69
Mvuha		18	138	863	14	107	570	9 69
Kiganila		-	-	-	11	84	303.5	10 77
Bwilajuu		11	84	722	12	92	199.6	6 46
Bwilachini		11	84	632	6	46	332	7 54
Magogoni		6	46	348	11	84	544	6 46
Lukulunge		12	92	967	16	123	885.6	7 54
Kidundo		9	69	490	4	30	368	3 23
TOTAL		151	58	9900	212	81	9933.4	170 65

In terms of wildlife utilization, the following problems were cited by communities as key issues that need immediate action:

- Inadequate quotas: there are complains that the allocated quotas are small and can not generate sufficient revenue for the community. The feelings are that, since the number of animals has increased, especially those allocated for hunting, the quotas should also increase. A particular emphasis was made on the hunting quotas for crocodile.
- Hunting Delays caused by the Wildlife Officer: there are complaints that in most cases JUKUMU community fail to utilize hunting quotas effectively because of the delays caused by the responsible WD Officer who is supposed to conduct the hunting exercise (they are not authorized to hunt on their own). There are complains that this officer is not available in time.
- Hunted animals are small thus getting small carcass weight contrary to expectations. This is partially caused by the delays in hunting that, by the time the officer responsible is available, it is done hurriedly to meet the deadline. As a result there is no time to conduct a proper hunting selection.

Though communities have formed an organized institution to manage wildlife for the purpose of benefiting from tourism and thus minimize poaching, subsistence poaching has been cited to be a problem. However, the level of subsistence poaching is regarded to be lower compared to previous years. Commercial poaching is said to be non-existent at present.

Though there are no proper records on poaching specifically in the area, the following records from the village game scouts indicate that the following number of animals were poached in the last three years.

Table 11: Poaching Statistics (2000-2002)

	Wildebeest	Gazelles	Reedbuck	Impala
2000	5	5	2	4
2001	2	3	1	4
2001	1	4	0	2

Source: Village Game Scouts Reports, 2003.

4.2.3 The status of vegetation communities and the suitability of the habitats for wildlife

The natural vegetation of the area is generally categorized as deciduous miombo woodland, but incorporates areas of riverine forest, woodland, wooded grasslands, bushland and swamp. Generally, these habitats offer a suitable grazing opportunity for diverse wildlife species, including plains game such as gazelles and wildebeest, forest game such as buffalo and elephants and for animals preferring wooded grassland areas such giraffe.

Open Grassland

This type of vegetation is estimated to occupy between 20-30% of the habitat. The open grassland includes short, medium and tall grass species. Some grassland areas get flooded during the wet season, thus remain swampy at most times of the year. In the critical dry season, these areas offer a very good grazing refuge for most plains game. The wildlife therefore tend to concentrate in these areas. Unflooded open grassland areas tend to be dominated by scattered palm and terminalia thickets. These areas tend to be occupied by wildlife throughout the year.

Woodlands

They are estimated to occupy between 60-70% of the total area. Woodlands are dominated by acacia and combretum tree species. There are different acacia species in the area due to micro-variations in climate. Among the species observed include; *Acacia gerrardii* which is mainly found in riverine areas and in areas subjected to flooding,

Acacia tortilis which grows in much drier parts of the WMA, *Acacia drepanolobium* and *Acacia negrescens* which tend to dominate the north-eastern part of the proposed WMA. There is a vigorous regeneration of acacia species in this zone and fire seems to have played a significant role in shaping this vegetation community. Typical miombo woodland tree species found in this vegetation community include species such; as *brachystegia*, *julbernadia*, *isoberlina*, *pterocarpus*, *dalbergia* and *combretem*.

Riverine forests

They are estimated to occupy between 6-8% of the area. Impressive riverine vegetation and dense impenetrable thickets are important habitats in along Mgeta and Ruvu rivers. These grow along with Borassus palms which are as high as 25 metres.

Swamps

They are estimated to occupy between 2 to 4% of the total area. A significant proportion of the area tends to be flooded during the wet season. These flooded areas tend to be unsuitable for most species of wildlife during the very wet seasons. They therefore tend to avoid these areas in the wet season and concentrate in other habitats. However, these flooded areas tend to have green pastures during the dry season, thus attracting wildlife. This natural phenomena therefore allows for periodic utilization of certain areas at certain times of the year, and providing opportunity for recovery for others. This provides ecological advantages in the utilization of the area by wildlife.

4.2.4 The current status and trends in water availability for wildlife

There are four permanent rivers across the proposed pilot WMA and they are the main source of water for wildlife in the area. The rivers are Mgeta, Duthumi, Ruvu and Mvuha. These rivers originate from Uluguru Mountains. There are small ponds and dams, namely Kengezua, Bigiza, Palala, Mkese and Nyabigado which are scattered in the area. However, these retain water for a short period of the year and tend to dry up in the dry season (Aug/Sept/Oct). It was also reported that water levels in all rivers are increasingly becoming lower each year. This problem is attributed by a continued expansion of cultivation in permanent water catchments and deforestation.

This trend is not good for the future of the proposed WMA and may jeopardize the effort to maintain the wildlife resource which is at present regarded as one among the potential income earner for the communities.

One of the observed problems in river bank erosion at River Mgeta. This has a potential of causing changes in the river hydrology and thus affect water availability in the area. The river seems to have a history of changing its course as well. This is an issue that needs a thorough monitoring.

4.2.5 An overview of wildlife movements

As with most important wildlife corridors and dispersal areas in Tanzania, the proposed pilot WMA is characterized by a high degree of seasonal movements of the large mammal species and wildlife is abundant in the areas outside the demarcated boundaries. Elephants move extensively throughout the area and are a source of human-wildlife conflicts in any village where they are found, raiding crops and in some cases causing human death.

It is claimed that from September to December, elephants and buffaloes move away from Gonabisi area moving closer to the villages where there are green pastures. During the dry season they move back to Gonabisi which is close to permanent water sources.

From July/August to November/December, there is also a huge movement of wildlife (mainly zebra, wildebeest, giraffe, and elephants) from SGR to Gonabisi area. It is claimed that this movement is motivated by the prevalence of water in these areas. It is further claimed that there is a big movement of elephants and buffaloes from Mikumi National Park to Gonabisi from June to December each year. In December they move back to Mikumi National Park.

These movements could not be mapped as the information provided could not give the necessary details required. The movements well known are restricted to the surroundings of the villages and not beyond that.

4.2.6 Status, trends and use of fisheries, forest and bee keeping resources

Status, trends and use of fisheries

There is subsistence fishing in the rivers around the area. Villagers complain that they can not conduct commercial fishing because there is an inadequate stock in the rivers to allow for a profitable commercial fishing. It is also claimed that the increase in the number of crocodiles prohibit fishing activities as they are done traditionally. There is therefore a fear of being attacked or killed by crocodiles.

Status, trends and use of forest and bee keeping resources

Forest utilization for timber and building seems to be an issue that needs a proper monitoring. Among the species commonly utilized for timber around the proposed WMA include *Pterocarpus angolensis*, *Balanites aegyptiaca*, *Millettia excelsa* and *Khaya nyasica*. Though these are at present not openly harvested in the proposed WMA, but the market for these products in Dar-es-Salaam and Morogoro puts a potential pressure in the proposed WMA. This pressure will not be limited to these species alone but other species as well suitable for timber.

The increasing human population also puts more demand for housing. This implies more harvesting of trees for that purpose. Commonly used species for construction purposes include *Acacia negrescens*, *Dalbergia melanoxylon* and *Burkea africana*.

Generally, the demand for forest products is increasing at the subsistence level for housing, and at the commercial level for the growing timber market in Morogoro and Dar-es-Salaam.

4.2.3 Human-wildlife conflicts and natural resource use conflicts

Human-wildlife conflicts and natural resource use conflicts in the area ad surrounding communities are numerous. Most of these are caused by the fact that more than 95% of the communities are agriculturalists practicing extensive cultivation in the vicinity of the proposed WMA. Being agriculturalists, their lifestyle also in most cases in incompatible with wildlife conservation. The major conflicts observed are:

Increased number of wildlife killings/attacks

Increased numbers crocodiles is increasing conflicts between communities and conservation organizations. Incidents of human wildlife conflict involving crocodile have been increasing over the past several years. In 1999-2000, 21 people were killed and 50 wounded and 56 livestock were injured or killed in villages surrounding the proposed WMA.

Crop damage

The cases of crop raiding are significant. The main vermin animals include elephants, buffalo and hippopotamus and wildpig. The extent of crop raiding is ranging from 2%-5% of the total cultivated area per annum in the villages of Mngazi& Vigolegole respectively. Mvuha, Dalla and Lukurunge estimate 35% crop destruction caused by hippos, wild pigs, baboons and monkeys. In Bwira Juu, Bwira Chini, Magogoni, Kiganila and Mvuha the main problematic animals are buffalo, elephants, hippos and baboons. It is estimated that about 2-5% of the cultivated crops are destroyed annually by these animal species.

Unplanned fires

There are a lot of unplanned fires caused by honey harvesters. The impact of these fires on the ecology of the area may be harmful in the long run.

Commercialization of timber harvesting

The increasing market for timber in Dar-es-Salaam and Morogoro puts excessive pressure on the forests in and around the proposed pilot WMA. Timber harvesting is at presently high at Kisaki Station, and the trees harvested mainly include; *Pterocarpus Angolensis*, *Milecea excelsa*, and *Balanites Aegyptica*. If this trend continues, the forests will be depleted, hence changing the ecology of the area.

Encroachment in the proposed pilot WMA

Encroachment for cultivation has been observed to be a serious problem. A number of farms with temporary huts were observed within a distance of 1to 2 km inside the boundary of the proposed WMA adjacent to the villages. This issue was discussed with the management of JUKUMU Society and the team was informed that this problem has been sorted out and there will no longer be any cultivation taking place inside the WMA. However, though this was the consensus of the majority, villagers who invaded the area were still busy preparing farms when this study was taking place.

Improper cultivation

Slash and burn cultivation is a common practice in the area. Most forests are continuously been cleared for cultivation. Farmers are doing this in an effort to increase productivity by opening virgin land. It has been learned that productivity is declining because farmers do not use fertilizers. Decreased productivity, leading to continued practicing of slash and burn cultivation is putting stress on the ecology of the area, and in the long run it will cause disasters if continues unchecked.

4.3 *Emerging Issues*

4.3.1 Timber harvesting

Illegal harvesting of high value timber has increased in the past few years. This is a result of the depletion of forests or strict controls in timber harvesting in most parts of the country. Evidently in this area there are no proper controls in place and this harvesting is done in unsustainable manner. A holistic approach to natural resources conservation is a matter of

urgency if the villagers have to attain their vision of benefiting from wildlife in a sustainable way.

4.3.2 Slash and burn cultivation

Forests are often cleared for cultivation. This frequent clearance is caused by the fact that there are no inputs made in the form of fertilizers to increase and/or maintain soil fertility. The plots therefore have to be abandoned after a few years. Colonization is abandoned farms has been observed, which is better than no vegetation at all. However, as mentioned above, these practices should be discouraged by adopting more environmentally friendly ways.

4.3.3 Declining quantity of water in major rivers

Water is a critically important factor attracting wildlife in the area. As observed, most wildlife movements in the area are largely influenced by the availability of water. Misuse of land upstream on Uluguru Mountains where these rivers originate, causes water levels to decline in the rivers. This is a potential threat to the wildlife in the proposed pilot WMA. The actual rate of decline has not yet been determined, but it is said to be significant.

4.3.4 Habitat shrinkage

Slash and burn cultivation, illegal timber harvesting and use of wood for building and other domestic uses reduce existing and potential habitats for wildlife in the area. As communities are empowered to manage wildlife, under normal circumstances it is expected that poaching levels will continue to decline. Ultimately the number of wildlife species will increase. That means more habitat is required. However, looking at the trend now is that, while wildlife numbers are increasing and potentially they will continue to increase, the habitats are continuing to shrink. These two parameters therefore are not positively correlated.

4.3.5 Unsustainable land use practices around the WMA

Unsustainable land use practices around the proposed pilot WMA are likely to create more conflicts with wildlife conservation initiatives. If wildlife conservation is to be sustainable, land use activities around the area have to be compatible. Unfortunately this does not seem to be the case now in most areas. Extensive cultivation is taking place along the boundary of

the proposed WMA, and as mentioned earlier, even inside the designated area. There is therefore a need to review the current land use practice and encourage more compatible forms of land use, especially within a distance of 1 to 3 km from the boundary of the proposed WMA.

4.4 Conclusions and Recommendations

The proposed pilot WMA is ecologically rich and offers a good buffer for Selous Game Reserve. The area has diverse habitats that are suitable for both forest and plains game. The abundance of wildlife and their distribution seasonally provides strong ecological links with both Selous Game Reserve and Mikumi National Park. It is therefore highly recommended for upgrading to WMA as this will also complement conservation efforts of the two protected areas.

In order to better manage natural resources within the proposed WMA, the following recommendations are proposed for consideration in the empowerment process:

- **Conduct an inventory of biodiversity in the area:** The proposed pilot WMA is part of SGR which is ecologically known to be rich in biodiversity. It is therefore recommended that a detailed biodiversity inventory be conducted in the area in order to have a complete and realistic picture of the biological resources available.
- **Establish a buffer zone adjacent to the villages:** The land in the villages areas adjacent to the proposed pilot WMA is intensively used for cultivation. Immediately after that intensive use, the land next to it is a designated Community Wildlife Management Area, which is being proposed to be upgraded to a status of a pilot WMA. If the intensity of land use in those areas is not regulated, conflicts between wildlife conservation and farming will intensify. It is therefore recommended that arrangements be made to set aside a specific zone around high intensity land use areas to establish activities which are compatible with wildlife conservation. Such activities can agroforestry or any other that may be deemed fit.
- **Conduct studies on wildlife movement patterns:** A thorough understanding of the wildlife movement patterns is crucial in the land use planning process. This is very important in reducing conflicts and designing better management strategies. The

study is highly important in community lands and adjoining lands which have a potential connectivity with the proposed WMA, SGR and Mikumi National Park.

- **Conduct studies to develop the fishing industry:** There seems to be potentials in the fishing industry which have not yet been developed. Studies are therefore recommended to develop this sector in order to diversify available economic opportunities for the communities. If this is not done, communities will heavily rely on wildlife resources alone, and this, if not properly controlled, may lead to over-utilization. This problem has already been observed, as communities are demanding more quotas, complaining that the presently given quota is not enough to generate a reasonable income.
- **Improve the bee keeping sector:** Just like the fishing sector, this sector has a lot of potentials which are not fully developed. Efforts should therefore be made to improve the sector so as to diversify sources of income to reduce heavy reliance on wildlife.
- **Improve land husbandry techniques:** There is a strong need to develop land husbandry techniques in order to protect the environment. The slash and burn practice is not ecologically sound given the immense pressure and high population growth in the area. Apart from improving land husbandry techniques, there is also a need to assess the rate of natural regeneration under different systems of clearing and to determine what if any long-term effect this has on the fauna and flora. Though coppicing was evident in some places where stumps remained, but further studies are required to establish the long-term regeneration of key species such as *Acacia*, *Combretum*, *Brachystegia*, *Julbernadia* and *Dalbergia*.
- **Institute mechanisms for monitoring water quality and quantity in big rivers:** Water quality and quantity are both important parameters for a healthier wildlife population. The water level in all rivers seems to be declining. However, there is no monitoring to track the severity of the problem. A mechanism should therefore be developed to monitor the quantity of water in these rivers. It is also important to track if there are any quality changes due to use of fertilizers and herbicides upstream.
- **Institutionalization of joint forest management programmes in the area:** If wildlife conservation efforts in the area are to succeed, a similar approach to forest

management should be adopted. There are a lot of forests in the area, though they are not legally protected. It is therefore recommended that a legal protection of these forests be considered, and empower communities to manage these forests under the guidelines provided by the Forest Department.

4.5 Way Forward

JUKUMU Society seems to be quite advanced in Community Based Wildlife Management. The way forward for the society now is to form as an Authorized Association, and proceed with arrangements for establishing a pilot WMA as provided in the Guidelines.

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APPENDICES

Appendix I: Important Data and Figures

Table I.1: Types of Business for Ukutu Area

	Shops	Local brew club	Tailoring	Restaurants	Food venders	Farm crop selling	Milling machine	Guest house	Milk	Bu
Mngazi	5	1	2	2	0	-	-	0		
Vigolegole	6	2	3	3	0	-	-	0		
Mvuha	17	0	0	15	10	many	-	0		
Dala	2	0	0	2	0	many	-	0		
Lukulunge	1	0	0	1	3	many	-	0		
Bonye	5	1	3	3			4	1	17	
Mbwade	27	1	2	8			3	0	25	
Bwakira chini	4	2		3			2	1		
Dakawa	4	2		4			3	1		
Kisaki St.	3	2	5		10		4	0		
Gomero	10	1	4		60		8	2		
Nyarutanga	2	1	4		5		5	0		
Milengwelengwe	9				2	30				
Sesenga	5				1	0				
Magogoni	4	3	1							
Kiganila	4	4	0							
Bwira juu	2	3	2							
Kiburumo	2	2	2							
Bwira chini	2	0	0							
Kongwa	2	3								2
Tulo	2	2								0

Table I.2: Natural Resource Related Businesses for Ukutu Area

		Carpentry	Fish	Charcoal	Beekeeping	Game meat	Building poles	Thatching grass	Fuelwood business
Twatwatwa	-	-	-	-	✓	✓	✓	-	-
Mngazi	-	-	3	4	3	0	0	0	0
Vigolegole	-	-	3	4	6	0	0	0	0
Mvuha	-	25	✓	10	0	0	0	0	0
Dala	-	26	✓	12	0	0	0	0	0
Lukulunge	-	25	✓	10	0	0	0	0	0
Bonye	3	✓	0	0	Quota	200	-		
Mbwade	6	✓	0	0	Quota	200	-		
Bwakira chini	2	-	3	0	0	0	0	4	3
Dakawa	2	-	1	0	0	0	0	3	0
Kisaki St.	10	3	0	1	1	-	-	-	3
Gomero	10	20	25	0	1	-	-	-	1

	Nyarutanga	5	0	3	2	1	-	-	2
	Milengwelengwe	3	-	2	-	-	-	-	-
	Sesenga	4	-	0	-	-	-	-	-
	Magogoni	✓	-	-	4	-	-	-	-
	Kiganila	✓	-	-	3	-	-	-	-
	Bwira juu	✓	-	-	3	-	-	-	-
	Kiburumo	✓	-	-	-	-	-	-	-
	Bwira chini	✓	-	-	-	-	-	-	-
	Kongwa	2	-	-	-	-	-	-	-
	Tulo	6	-	-	-	-	-	-	-

- = not mentioned

✓= the number is not know

Table I.3: Village Government Source of Incomes

	Income source No.1	Income source No.2	Income source No.3	Income source No.4
Twatwatwa	Villagers contribution	Development levy	Cess	
Mngazi	Wildlife mainly from quota	Development levy	Cess	
Vigolegole	Wildlife mainly from quota	Development levy	Cess	
Mvuha	Wildlife mainly from quota	Development levy		
Dala	Wildlife mainly from quota	Development levy		
Lukulunge	Wildlife mainly from quota	Development levy		
Bonye	Wildlife mainly from quota	Development levy	Cess	Villagers contribution
Mbwade	Wildlife mainly from quota	Development levy	Cess	Villagers contribution
Bwakira chini	Wildlife mainly from quota	Development levy	Cess	
Dakawa	Wildlife mainly from quota	Development levy	Cess	
Kisaki St.	Wildlife mainly from quota	Development levy		
Gomero	Wildlife mainly from quota	Development levy		
Nyarutanga	Wildlife mainly from quota	Development levy		
Milengwelen gwe	Wildlife mainly from quota	Development levy	Tractor	
Sesenga	Wildlife mainly from quota	Development levy		
Magogoni	Wildlife mainly from quota	Development levy		
Kiganila	Wildlife mainly from quota	Development levy		
Bwira juu	Wildlife mainly from quota	Development levy		
Kiburumo	Wildlife mainly from quota	Development levy		
Bwira chini	Wildlife mainly from quota	Development levy		
Kongwa	Wildlife mainly from quota	Development levy	Cess	Land renting
Tulo	Wildlife mainly from quota	Development levy	Cess	Land renting

Table I.4: Management Protection Expenditure

	1997/1998	1998/1999	1999/2000	2000/2001	Total	Average
Mngazi	356,442	161,219	276,100	97,012	890,773	222,693
Vigolegole	417,292	186,000	320,000	215,000	1,138,292	284,573
Mvuha	452,542	265,380	309,730	210292	1,237,944	309,486
Dala					0	0
Lukulunge	349,782	191,700	75,000	59,000	675,482	168,871
Bonye	359,442	274,750	313,430	164,000	1,111,622	277,906
Mbwade	520,842	123,770	260,610	125,000	1,030,222	257,556
Bwakila Chini	506,742	51,950	278,605	140,000	977,297	244,324
Dakawa	418,442	105,890	287,100	120,000	931,432	232,858
Kisaki station	568,192	353,500	179,500	134,000	1,235,192	308,798
Gomero	531,742	300,300	152,900	300,200	1,285,142	321,286
Nyarutanga	389,042	220,200	355,960	126,000	1,091,202	272,801
Milengwelengwe	455,792	178,400	296,150	150,000	1,080,342	270,086

Sesenga	471,052	194,620	122,500	95,000	883,172	220,793
Magogoni	375,017	67,210	178,650	145,000	765,877	191,469
Kiganila	337,992	26,000	116,160	175,000	655,152	163,788
Bwila juu	390,542	18,500	114,000	155,000	678,042	169,511
Bwila chini	308,642	54,000	186,300		548,942	137,236
Kiburumo						0
Kongwa	343,942	61,400	66,000	60,000	531,342	132,836
Tulo	218,842	56,000	28,000		302,842	75,711
Kidunda		233,000		52,030	285,030	71,258
Total	7,772,323	2,890,789	3,916,695	2,855,504	17,435,311	4,358,828
Average	409,070	152,147	206,142	150,290	917,648	229,412

Table I.5: Expenditures on Village Development

Village	1997/1998	1998/1999	1999/2000	2000/2001	Total	Average
Mngazi	114,200	34,000	10,000	100,000	258,200	64,550
Vigolegole	80,000	5400	82,670	100,000	268,070	67,018
Mvuha	50,000	94,000	37,100	202,000	383,100	95,775
Dala					0	0
Lukulunge	43,000		90,000	100,000	233,000	58,250
Bonye	50,000		9,500	102,100	161,600	40,400
Mbwade	125,000	8,000		200,900	333,900	83,475
Bwakila Chini	80,000	192,460	100,000	200,000	572,460	143,115
Dakawa	100,000	44,860	25,000	233,000	402,860	100,715
Kisaki station	86,000	3,500		154,000	243,500	60,875
Gomero	230,000	117,000	200,000	120,000	667,000	166,750
Nyarutanga	53,000		3,000	100,000	156,000	39,000
Milengwelengwe	150,000	10,500	60,000	200,000	420,500	105,125
Sesenga	114,200		41,000	100,000	255,200	63,800
Magogoni			53,000	120,000	173,000	43,250
Kiganila	108,450	22,600	14,500	50,000	195,550	48,888
Bwira juu	71,130			90,000	161,130	40,283
Bwira chini	67,400				67,400	16,850
Kiburumo					0	0
Kongwa	14,000			100,000	114,000	28,500
Tulo		15,000			15,000	3,750
Kidunda		235,000	10,000		245,000	61,250
Total	1,536,380	782,320	735,770	2,272,000	5,326,470	1,331,618
Average	90,375	60,178	45,986	142,000	280,341	70,085

Table I.6: Wealth Ranking Criteria, Ukutu-JUKUMU Area

Village	Magenge	Milling machine	Modern house	Able to cultivate	Food sufficiency	Shops	Cash saving	% of poor people
Mngazi	1+	1+		10+	✓	1+		75
Vigolegole	1+	1+		10+	✓	1+		75
Mvuha			1+	5+	✓		200000/=+	60
Dala			1+	5+	✓		200000/=+	70
Lukulunge			1+	5+	✓		200000/=+	75
Bonye		1+	1+		✓			70
Mbwade								
Bwakira chini								
Dakawa								
Kisaki St.		1+	1+		✓			70
Gomero					✓			
Nyarutanga					✓			
Milengweleng we					✓			
Sesenga					✓			
Magogoni					✓			
Kiganila					✓			
Bwira juu					✓			
Bwira chini					✓			
Kiburumo					✓			
Kongwa					✓			
Tulo								