

**MINISTRY OF NATURAL RESOURCES AND**  
**TOURISM**  
**WILDLIFE DIVISION**

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

**FINAL REPORT**

**VOLUME III: TWATWATWA**

**By**

**Dr. C.G. Mung'ong'o (Sociologist & Team Leader)**

**Dr. Agnes Mwakaje (Economist)**

**Mr. Allan Kijazi (Ecologist)**

**With the help of:**

**Mr. Mathew Maige, Wildlife Division**

**Mr. Lazaro Yohana, GTZ-Tanzania**

**Ms Bupe Yoram, University of Dar es Salaam**

**June, 2003**

## TABLE OF CONTENTS

Executive Summary.....	4
I. INTRODUCTION.....	17
1.1. Background.....	17
1.2 Study Objective .....	18
1.3 The Study Area.....	18
1.4 Literature Review .....	19
1.4.1 The concept "Community Based Natural Resources Management" (CBRNM).....	19
1.4.2 Problems and prospects of CBNRM.....	21
1.5 Methodology.....	22
FINDINGS .....	22
2.0 SOCIOLOGICAL ASPECTS.....	22
2.1 Demographic Trends .....	22
2.2 Migration Patterns .....	22
2.3 Household Characteristics .....	23
2.3.1 Type of households.....	23
2.3.2 Household size and composition .....	23
2.3.3 Dependence ratios.....	24
2.4 Natural Resource Use Patterns and Access Mechanisms .....	24
2.5 Institutional Set-Up.....	24
2.6 Issues of Governance.....	25
2.7 Relationship Between Village Governments and CBOs.....	26
2.8 Villagers' Solidarity and Participation in Community Development Initiatives .....	26
2.9 Understanding the Concept WMA .....	26
2.10 Emergent Issues: A Discussion .....	27
2.10.1 Political constraints.....	27
2.10.2 Institutional constraints.....	27
2.11 Conclusion and Recommendations.....	27
2.12 The Way Forward.....	28
3.0 ECONOMIC ASPECTS.....	29
3.1 Level of Development of the Twatwatwa WMA .....	29
3.2 Socio-Economic Infrastructure .....	29
3.3 Common Diseases and Related Costs.....	30
3.4 Economic Activities .....	30
3.5 Access to Markets.....	31
3.6 Sources of Incomes.....	31
3.6 Non-Farm Economic Activities .....	31
3.7 Poverty Levels .....	31
3.8 Consumption Patterns.....	32
3.9 Land Use Patterns .....	32
3.10 The Three Year Development Plan .....	32
3.11 Natural Resource Committee.....	32
3.12 Some Conservation Initiatives .....	33
3.13 Economic Potential.....	33
3.14 Tourist and Resident Hunting .....	34
3.15 Sport Hunting .....	34
3.16 Live Animal Capture and Sale.....	34
3.17 Beekeeping .....	34
3.18 Fisheries Management.....	35
3.19 Beads for Tourists.....	35

3.20	Emerging issues .....	35
3.21	Conclusion and Recommendations .....	36
3.22	Way Forward .....	37
4.0	ECOLOGICAL ASPECTS .....	39
4.1	Situation Analysis .....	39
4.2	Ecological Data and Analysis .....	40
4.2.1	The current ecological status of the area .....	40
4.2.2	Trends and Use of Wildlife .....	41
4.2.3	The Status of Vegetation Communities and an Assessment of the Suitability of the Habitats for Wildlife .....	45
4.2.4	The Current Status and Trends in Water Availability for Wildlife .....	46
4.2.5	An Overview of Wildlife Movements .....	46
4.2.6	Status, trends and use of fisheries, forest and beekeeping resources and other biological resources .....	47
4.2.7	Human-Wildlife Conflicts and Natural Resource Use Conflicts in general .....	48
4.3	Emerging Issues .....	49
4.3.1	Ecological Viability of the Potential WMA .....	49
4.3.2	Blockage of wildlife corridors .....	49
4.3.3	Habitat shrinkage .....	49
4.3.4	Intensified land use conflicts .....	49
4.3.5	Decreased number of Wildlife Populations .....	50
4.3.6	Unsustainable land use practices around the area .....	50
4.4	Conclusions and Recommendations .....	50
4.5	Way Forward .....	52
	REFERENCES .....	53

## **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 WMAs. Hereunder we present the methodology used in the baseline survey done in the proposed Idodi-Pawaga, Ukutu-JUKUMU and Twatwatwa pilot WMAs.

### **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 IRA, MNRT and WD. There were also consultations with key and primary stakeholders (individuals) in the above listed institutions, councilors, and other key players. In Kilosa District we visited the District Wildlife Office for information and logistics. We also searched for additional information from the Internet.
- Primary data was collected from Twatwatwa village, spending about three hours of interviews in the village. Discussions and/or meetings were conducted with the village government, 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 the villagers. The selection of household for the interviews was done randomly, 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 23 households.
- Physical observation of the study area was done to assess levels of WMA encroachments 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 literature review 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 WMAs. 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 WMAs. 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 village. 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.
- a checklist of ecological information relevant to the proposed WMA was administered to the village leaders. 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 the areas were obtained from Kilosa Districts' Lands Development and Natural Resources Offices. In most cases there were no extra copies, the maps had to be de-drawn 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 Twatwatwaa is gradual, registering only 19% growth between 1988 and 2002. Much of the change is due to natural growth. The village has been inhabited by pastoralist Maasai from Kiteto since 1960s.

##### *Natural resource use*

- Fuelwood is the most used resource in the proposed WMA, followed by charcoal, building poles, thatch grass and medicinal plants. Wildlife is widely recognized as an important resource in the proposed WMA; the influence of the work by a Kenyan NGO is evident in this respect.

##### *Institutions/ Set-Up*

- The standard village government structure comprising three main committees (Planning and Finance; Peace and Security, and Social Services Committees) prevails in the village. Under these committees are various specialized sub-committees. The Natural Resources Sub-Committee operates under the Planning and Finance Committee.

##### *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 is only one active CBO in the village.

### *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 in Twatwatwa is only 20%.

### *Level of development of WMA*

- Twatwatwa is in its initial stages of development. They have a Natural Resources Committee but have no Game Scouts. They are yet to form an Authorised Association.

## **Economic Aspects**

### **Land use**

According to villagers land use pattern is divided into residential, agriculture, livestock and conservation. No land has been set aside for later use. There was no land conserved for ecological purposes.

The same problem experienced at household level, where farmers were able to mention number of plots and crops grown but it was very difficult to provide acreage under each crop. This is partly because farmers practice intercropping rather than pure stands. In addition, data on the quantities of fish caught are not easily available at village government level. This is mainly because most of the fishing activities are undertaken on subsistence levels and no records are kept for catch volumes.

Land for grain farming is plenty and many people practice shifting cultivation. However, land for rice farming and gardening is not adequate in the village. There is inadequate land for grazing and water for livestock and has been the major source of conflict between farmers and livestock keepers. But also poor governance by VGs in managing and allocating resources to different users has contributed to these conflicts.

### **Village economic status**

Livestock keeping is the main economic activity in the proposed Twatwatwa WMA followed by agriculture. There is also petty business especially during dry season, including shops, transport services, milling machines, et cetera. Fishing and beekeeping are operated on subsistence levels.

### **Agricultural farming technology**

The hand hoe and the ox-plough dominates the Twatwatwa agricultural system. Input use is non-existent. Farming is rain-fed.

### *Overall village economy*

Village government's economic status is mainly influenced by the major economic sources existing in the WMA, which include agriculture, livestock keeping, petty trade and fishing. The village's economy is low as it is agriculture dependent. Income from other sources, such as employment, is almost negligent. Although households also considerably benefit from natural resource extraction, such information is very difficult to quantify because they are used mainly at subsistence levels. Poor record keeping on incomes 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 maize, most of the crops are produced at subsistence levels. 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 to the crops that go through markets.

Agricultural productivity is very low in the village. The reasons given for the declining yield trends includes 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 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***

Income sources at household level are mainly from agriculture and related activities. Other activities include business, fishing, beekeeping, carpentry, charcoal and fuel wood sales. Income earning by the villagers show over 83% of the 23 respondents in Twatwatwa, respectively, are earning less than one dollar a day. Other sources of incomes at household levels come from business, employment, remittance and labour selling. However, 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 too their incomes are under-represented because of poor record keeping.

#### ***Expenditure at household levels***

Information at household expenditure was not easily available, especially in the form of quantities and money terms; since farmers do not have the tradition of keeping records of their incomes and expenditures. Villagers were, however, able to list areas of income expenditure such as buying domestic goods such as soap, sugar, and cloth, and paying of health services, educational services and farming costs.

Nevertheless, health and education appears to consume a lion's share of the households' incomes in the proposed WMA. Parents incur costs on education in terms of school fees, uniforms, books, contributions et cetera. According to the interviews costs per primary school child is about Tshs. 50,000/= per year.

Water borne diseases such as diarrhoea, typhoid, and dysentery and malaria are common in the village. It was reported that at least three quarters of the villagers suffer from malaria annually and a high proportion of this segment had repeated malaria incidences of about 4-6 times per year. The village does not have proper health services. It is lacking in qualified personnel and drugs. Thus improving water sources, providing health services and controlling malaria will have a big impact on peoples' welfare.

According to villagers, the minimum cost one can incur for treating malaria is Tshs. 1,500 per illness or Tshs. 6,000-9,000 per person per year. About 80% of the population fell sick of dysentery, typhoid and diarrhoea 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. Also, there is a high incidence of TB and typhoid, which was reported to be 10% and 25%, respectively.

### ***Income sources by VG***

Only sources of incomes were easily provided but not the quantities as well as money income per activity. The income sources for village governments depend very much on development levy, cess from petty trade in the villages, fines for by-law violators, wildlife quota and other natural resources uses.

Total income for the Twatwatwa VG for the year 2001/02 was approximately Tshs. 11,700,000. The high income in the village was due to high support from donors' rather own village income generation. Income from wildlife resources was very low, Tsh. 70,000/= or 6% only of the total VG incomes.

### ***VGs expenditures***

Total expenditure for the Twatwatwa VG was Tsh. 11,700,000/=. This is 100% of total income for the village. There was no expenditure breakdown in the village. Expenditure per sector is important to be clearly shown for monitoring purposes and therefore villages should be encouraged to show clearly how the income was spent. Also it should be noted that allocation for village development projects need to increase if the objective of reducing poverty in the proposed WMA is to be achieved. Increasing money for development projects is perhaps the major incentive for villagers to feel a sense of ownership for the

proposed WMA and this in return may become an incentive for them to cooperate in protecting the WMA against poachers and illegal extraction of natural resources.

Also 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 savings 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.

### **Natural resource use patterns**

Results from the household interviews and group discussions show that almost 100% of the respondents use natural resource in one way or another. The natural resources used in the village include timber, fish, charcoal, honey, building poles, thatching grass, minerals, medicine, fruits, mushrooms, vegetables and bricks. Attempts to capture natural resources consumption rates failed because natural resources are used mainly at subsistence level. Where it is used for business, people are reluctant to disclose quantities and money incomes due to fear of many things, including arrest by the government and taxation.

### ***Mechanisms for natural resource access***

Natural resources for home use, e.g. fuelwood collection, cutting of building poles, thatching grass, wild food et cetera, are extracted without any permit. 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. Despite the existing laws and by-laws for natural resources use, there is substantial illegal extraction of resources in the village, suggesting that either the laws/by-laws are not available or there is no incentive to enforce them.

### **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 village. A high proportion of farmers sell their farm products locally either to the traders who come to buy crops or among the farmers themselves. Agricultural products are marketed by private traders and periodic markets (*magulio*). The major complains from farmers is low prices offered by traders relative to the cost of production. During the harvesting periods prices are very low and farmers sell their maize at between Tsh. 6000/= and 10,000/= during harvest and lean seasons, respectively. Nevertheless, due to high demand for cash as well as lack of efficient storage facilities, a high proportion of farmers sell their produce immediately after harvest and as a result, they get very low prices.

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 and livestock keepers 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 the same traders 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 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 cattle for enough money to buy food. The prices for livestock vary, ranging from as low as 30,000/= to 150,000/= depending on the size of the animal and buyers' availability. According to the livestock keepers, cattle buyers come from town, they know each other and the auctioneer, and therefore they can easily collude for low prices.

## **Economic agents**

### ***Existing investors***

There are very limited investors in the proposed WMA. In Twatwatwa the Irish Aid and Kenyan government are helping the village to build a water dam for home use and for livestock. 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 are contribute in kind by providing labour power. They can also contribute financially from their VG earnings.

### ***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 as skilled and unskilled labour. There is no any sort of joint venture that exists in the village.

## **Financial facilities**

Neither formal nor informal financial institutions were seen in Twatwatwa village. This may suggest that either borrowing is not common among the Maasai, or every household can afford to meet basic requirements without assistance from external sources.

### **Poverty levels**

Poverty is widely spread and pervasive in the village. Using their own criteria (e.g. ownership of large numbers of cattle, shops, modern houses, and milling machine) over 50% the Twatwatwa households are poor. This number is likely to be higher when one compares with the national standard 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 a wide range of food consumption patterns, food composition is dominated by starchy foods with very little protein and fat 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 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 or by the local NGOs.

### **Economic opportunities to increase VG incomes**

A high proportion of the people interviewed do not have any idea on how they could increase their incomes from wildlife utilisation following the implementation of the proposed WMA. Indeed, many villagers were not able to say anything on how they were going to improve their VGs' incomes from the WMA. After brainstorming with the researchers the villagers were able to mention economic opportunities such as ecotourism, tourism related to water fall attractions, hot springs tourism and cultural utilization, climbing hills, camp sites, optimization of game meat quota's and business on live birds and photographing. People expressed interest of practicing beekeeping. Currently, very few appear to practice it due to lack of knowledge on the sector. Also fishing activities is one of the potential areas to increase wildlife income and nutrition by villagers.

## **0.4 Ecological Aspects**

### *Vegetation*

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

### *Wildlife Populations*

Tables 1 – 4 animal and bird numbers, species and densities in the proposed WMA.

**Table 1: Animal Species Found in the Twatwatwa Area**

<b>English Name</b>	<b>Scientific Name</b>
Elephant	<b>Loxodonta africana</b>
Buffalo	<b>Syncerus caffer caffer</b>
Eland	<b>Taurotragus oryx</b>
Wildebeest	<b>Connochaetes taurinus</b>
Lion	<b>Panthera leo</b>
Leopard	<b>Panthera pardus</b>
Impala	<b>Aepyceros melampus</b>
Hunting dog	<b>Lycaon pictus</b>
Southern redbuck	<b>Redunca arundinum</b>
Warthog	<b>Phacochoenus aethiopicus</b>
Common waterbuck	<b>Kobus eliprinunus</b>
Zebra	<b>Equus bruchelli</b>
Caracal	<b>Felis caracal</b>
Velvet monkey	<b>Cercopithecus aethiops</b>
Yellow baboon	<b>Papio anubis</b>
Africa hare	<b>Lepus capensis</b>
Advaak	<b>Orycteropus affer</b>
Porcupine	<b>Hystrix galeata</b>
Stripped jackal	<b>Canis adustus</b>
Golden jackal	<b>Canis aureus</b>
Crocodile	<b>Crocodilus niloticus</b>
Giraffe	

Source: Field data, 2003.

**Table 2: Bird Species in the Twatwatwa Area**

<b>English Name</b>	<b>Scientific Name</b>
Cattle Egret	<b>Bubulens ibis</b>
Great White Egret	<b>Egretta alba</b>
Grey Heron	<b>Ardea Cinerea</b>
Hammerkop	<b>Scopus umbretta</b>
Saddle-billed stork	<b>Ephippiorhynchus senegalensis</b>
Marabou stork	<b>Leptoptilos crumeniferus</b>
Gloss ibis	<b>Plegadis fakinellus</b>
Egyptian Goose	<b>Alopochen aegyptiaca</b>
Supur wing goose	<b>Rtrectroptenis gambensis</b>

Ruppells grifon vulture	<b>Gyps ruppellii</b>
Long-creasted eagle	<b>Lophaetus accipitalis</b>
Tawny eagle	<b>Aquila rapax</b>
Helmeted guinea fowls	<b>Numida meleagris</b>
Blacksmith plover	<b>Venellus armatus</b>
Crowned plover	<b>Venellus coronatus</b>
Ring-necked dove	<b>Streptopelia capicola</b>
Emerald-spotted word dove	<b>Oena capensis</b>
Green pigeon	<b>Turtur chalcospilos</b>
Brown parrot	<b>Treron calva australis</b>
White-bellied go-away bird	<b>Poicephalus meyeri</b>
White browed caucal	<b>Corythaixoides</b>
European swift	<b>Apus Apus</b>
Speckled mvusebird	<b>Colius striatus</b>
Melachite kingfisher	<b>Carythonis cristata</b>
Lucal breasted roller	<b>Coracias caudate</b>
Ground hornbill	<b>Bucorvus cafter</b>
Grey hornbill	<b>Tirkus nasutus</b>
Fiscal shrike	<i>Lanius collaris</i>
Paradise flycather	<b>Tersiphone viridis</b>
Red-cheeked cordon-bleu	<b>Uraeginthus bengalus</b>
Red-billed firefinch	<b>Lagonosticta senegala</b>
Bronze Mannikin	<b>Lonchura cocullata</b>
Pin tailed whydah	<b>Vidua marcoura</b>
Reichnows weaver	<b>Ploccus baglafecht reichnow</b>
Red billed buffalo weaver	<b>Weaver bubalornis niger</b>
Yellow bishop	<b>Euplectes capensis</b>
Red billed quelea	<b>Quelea-quelea</b>
Superls starling	<b>Spreo superbus</b>
Drongo	<b>Dicrurus adsmimilis</b>

Source: Field data, 2003.

#### *Wildlife Utilization*

- Resident hunting is practised in Twatwatwa.

### *Wildlife Movements*

- Twatwatwa: a dispersal area for the Mikumi and Udzungwa NPs.

### *Human-Wildlife Conflicts*

Crop raids and livestock attacks by problem animals are major problems in the proposed WMA.

### **Potential WMA Management Problems**

- Poaching is especially rampant in some villages not involved in the Twatwatwa proposed WMA.

### **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 the 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.
- Little is known about the ecological base and therefore the socio-economic potential of the Twatwatwa WMA.
- There is a tense conflict between the Maasai in Twatwatwa village and the crop cultivating villages surrounding the proposed WMA. This threatens the sustainability of this WMA. The Twatwatwa village has developed the conservation management programme alone without

consulting other villages in the area. At the same time other villages such as Mbande feel to have ownership of the Twatwatwa resource and have the right to use it.

## **0.6 Recommendations**

- 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 all WMAs case by case to establish cost benefit analysis and comparative advantages for each WMA. This is important for each WMA to operate in areas, which is more efficient and competitive. Comparative advantage could be in terms 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.
- Intensive studies should be commissioned for study of ecological potential of the Twatwatwa proposed WMA area. Also to identify key stakeholders surrounding the village and on how could share the resource management and utilization.
- The government in collaboration with local authorities and other stakeholders should try to find ways of reducing conflicts between the Maasai community in Twatwatwa and other villages that surround the proposed WMA. One approach could be participatory development of conflict reduction mechanisms. This needs to be developed by all communities surrounding the WMA.
- 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.
- There is need to identify and map all wildlife corridors which are increasingly being taken up for agriculture expansion in Twatwatwa.
- Conduct studies on the viability of conservation compatible activities such as beekeeping, fish farming, etc.

## **I. 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.

### *1.3 The Study Area*

The village of Twatwatwa is in Morogoro Region, Kilosa District, Kimamba Division and Ludewa Ward. The area is located 36 km from Kilosa town, along the road from Kilosa to Morogoro via Mkata, or 18 km from Kimamba town to the west side of the town. The area shares a boundary with Mkata Ranch in the East, Madoto Ranch in the West, and the village of Rudewa Mbuyuni in the South.

The rain season starts in November and rains heavily during March. From June to December the area is comparatively dry. The area is dominated by sand loam soils in woodland and open grassland. Black cotton soils are predominant in the riverine and mbuga areas.

## 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 gazettement of 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 1).

**Table 1: 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.<sup>1</sup>

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 result of the intermarriage between indigenous knowledge and scientific knowledge (Tacconi and Benett, 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. 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.

### 1.5 Methodology

Both primary and secondary data were collected from Twatwatwa Village and one of the neighboring villages surrounding the 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

Data from the 1988 and 2002 census years show that population growth in Rudewa Ward, where the village of Twatwatwa is located, is fairly gradual. (Table 2). Between the two census years, for example, the population in the ward changed positively by only 19.1%. Much of the growth has been recorded for females (19.3%), which indicates that much of the growth is probably due to natural growth rather than in-migration. The 40.0% increase in household numbers pays testimony to this explanation.

**Table 2: Population Change in Rudewa Ward, 1988 & 2002**

Sex	1988	2002	% Change
Males	5,726	6,814	19.0
Females	5,938	7,082	19.3
Total	11,664	13,896	19.1
No. of Households	2,237	3,133	40.0
Household sizes	5.2	4.4	-

Source: Census Reports, 1988 & 2002.

#### 2.2 Migration Patterns

Twatwatwa village is and has ever been inhabited by the pastoralist Maasai ever since they moved into this area from Kiteto in the 1960s. These people were drawn to the area by the livestock keeping potential provided, especially the availability of pastures and water. The village was registered as a pastoralist village during the villagization

programme. There have since been very few in- and out-migrations. Interview data show, for example, that of all the 23 respondents interviewed only 18.2% were born from outside Morogoro Region. Movement in and out of the village is mainly due to marriage (73.7% and 90.9%, respectively). Other reasons included following relatives, villagization and fleeing from ethnic conflicts in neighbouring. By 1998 the village had 120 *bomas* with 3,500 people. Temporal transhumance in search of pastures is also practised during the dry season.

### 2.3 *Household Characteristics*

#### 2.3.1 **Type of households**

Pastoral homesteads (*boma*) 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 Twatwatwa. It is thus that the interview data show that all of the 23 questionnaire interviewees were males.

#### 2.3.2 **Household size and composition**

According to Mung'ong'o and Mwamfupe (2002) a Maasai family (*olmarei*) is normally polygamous. The number of wives and children varies with the age of the husband/father. Each wife has a separate house (*engaji*) within a boma (*enkang*). Within the boma there are also separate houses for relatives and friends whose presence is in most cases fluid. Although a tendency towards having large single households in the modern sense was observed among the wealthier Maasai in Twatwatwa, possibly due to individualization of social life, it was difficult to decide which of the units *engaji*, *olmarei* or *enkang* could be treated as a **household** unit of analysis.

Gender perception and differentiation with reference to natural resource and social services use rights were also assessed during the in-depth interviews. Women research assistants were used to interview the Maasai and other women in the sample. Maasai women are difficult people to talk to due to their busy schedules. Not only are they responsible for maternal caring and provisioning<sup>2</sup> in the household (*enkaji*), they are also responsible for milking of

---

<sup>2</sup> The term **provisioning** includes searching for food, water, fuelwood, and other provisions necessary for

cows, selling of milk, herding and caring of young animals, and constant repairing of the house structures (especially the *manyatta*).

### 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 village. The highest is among the middle and the well-off wealth groups, followed by those of the poor social group. This tendency is explainable by differentiated access to labour. The well-off households have the biggest labour force in the village and can thus afford to keep large families. On average, however, the dependence ratio in the village is 2.0.

#### 2.4 *Natural Resource Use Patterns and Access Mechanisms*

According to the 23 respondents interviewed the main natural resources, other than land, used by the people of the village from the local forests is pastures (100.0%), fuelwood (85.2%), building poles (20.2%), medicinal plants (20.2%) and thatch grass 19.3%). Others are honey, game meat and fruits. Wildlife is recognized as an important natural resource in the village.

#### 2.5 *Institutional Set-Up*

Traditionally, the Maasai in the proposed pilot WMA had socio-political institutions which governed every day natural resource use. In the areas of origin in Kiteto, the political units were either based on territoriality, clan or age-set relationships. The coming of colonialism and eventually the new state affected all these local political setups. The traditional political organizations were superceded by new power structures involving non-indigenous village personalities. In reality, however, these changes did not significantly alter the traditional socio-cultural fabric of these cultures. Despite the shrinkage of pastures in Maasailand resource management and use has in the expansion areas continued being mediated by traditional tenure regimes and other local resource use arrangements. In Twatwatwa most of the grazing and range management decision-

---

a family's livelihood.

making is still communally done through the *Oleugwanani* and his *Ingopir* assistants. Such traditional leaders command great respect among Maasai communities.

Despite this parallel management structure, at the administrative level the standard village government (VG) structure prevails. 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 the village shop, milling machines, water supply system, 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 the village to gauge their effectiveness as development levers. Generally, governance in this village is more responsible and transparent than seen in other villages visited elsewhere. Leaders elected/chosen to lead the various institutions, including the village government, are said to be more responsible. Principles of good governance are probably imparted to the incumbents by the traditional power structures. The absence of Opposition Parties in the village is thus not an issue as the traditional mechanisms of social censure guard against excesses or

abuse of power. Hence, of the 23 respondents interviewed 95.7% reported that meetings were called quite regularly. Meanwhile, 61.9% of the respondents reported that income and expenditure reports were responsibly given by the Village Government.

### *2.7 Relationship Between Village Governments and CBOs*

The Twatwatwa village has one community-based organization (CBO), which deals with planning and implementing village projects such as cattle dips, dams and schools construction.

### *2.8 Villagers' Solidarity and Participation in Community Development Initiatives*

People's participation in decision-making and leadership accountability in resource allocation is very high in Twatwatwa village. As already discussed in Section 2.6 of this report, the traditional political organizations, which every Maasai reveres, have not in this village been totally superceded by new power structures. The reason is that the village personalities are drawn from or draw their legitimacy from the traditional power structures. Hence, the modern power structure at the village level has not significantly altered the traditional socio-cultural fabric of this community.

### *2.9 Understanding the Concept WMA*

Of the 23 villagers interviewed, only 20.0% indicated that they understood the concept by properly mentioning the three components of participation, benefit sharing and resource conservation. Some 30.0% mentioned participation and resource conservation, while 20.0% mentioned participation alone. Thus although the WMA concept is liked by 90.9% of the respondents, it is not well understood. This is most likely a result of lack of conservation projects such as MBOMIPA and JUKUMU in the proposed WMA. It is thus that 52.9% of the respondents thought capacity building through training and awareness raising was imperative.

## *2.10 Emergent Issues: A Discussion*

### **2.10.1 Political constraints**

It has been observed in the other reports that representative democracy relies on elected representatives, namely Members of Parliament (MPs), District Councilors, Village Councilors and Village Chairpersons to act on behalf of those who elected them. The general conclusion was that the representative system is not functioning properly. In Twatwatwa the case of the local MP and district councilor was said to be even worse. The villagers felt that both the MP and the Councilor did not engage in regular consultations with their local constituents because they were not pastoralists. The villagers sincerely believed that the district leadership was deliberately acting against them in favour of the agriculturist ethnic groups in the smoldering land use conflict because they were pastoralists.

### **2.10.2 Institutional constraints**

The situation has created palpable animosity against the district leadership and the adjacent agricultural communities. Ulterior motives of politicians who like to retain as much votes as they can, have many times fueled such conflicts, making natural resource use planning at the local level difficult. The institutional framework for this pilot WMA will have to take these feelings on stride and harmonise their conflictual relationships.

## *2.11 Conclusion and Recommendations*

The village is surveyed and has a total area of 30,830 ha. No area is specifically set aside as a potential WMA. Villagers have a notion that they can make the whole village land a WMA. This is contrary to the issued guidelines, which require proper zonation of villages, indicating different land uses. However, given the observed situation in the field, if the community agrees to set aside a pilot WMA, the northern half of the area should be given priority for four main reasons:

- a) The area is largely tsetse infested thus might not be very useful for other economic activities.

- b) Due to tsetse infestation, there are very few settlements and most of them are temporary. It will, therefore, be easy to remove those settlements and promote wildlife conservation and hunting.
- c) The area has a better vegetation cover and is representative of all vegetation communities in the area. It has, therefore, the potential of harbouring all animal species and thus maintaining the animal diversity of the area.
- d) There is sufficient water throughout the year, as the area is bounded by Wami River in the west, Mkata River on the east and a convergence of the two rivers in the north.

### *5.0 The Way Forward*

The main foreseeable problem is lack of co-operation that has at times led to open hostilities with the adjacent agricultural communities. If the village continues to stand alone in this effort there are risks of losing much wildlife due to poaching. There is also a risk of losing many wildlife corridors as a result of expanding agriculture. All of these may in turn jeopardize the ecological value of the area.

In general the establishment of a pilot WMA at Twatwatwa will have also to consider several organizational problems, including:

- Inadequate coordination at the district level, leading to the lack of a body of management statistics on the extent and status of various natural resources, including wildlife; a problem that incapacitates proper resource use planning.
- The organizational structure of some of the traditional Maasai institutions not reflecting the democratic nature commensurate with community-based organizations, where executive members ought to be accountable to the natural resources committees and/or general assemblies.
- Poor capacity of district natural resource officers in implementation and regulation enforcement, leading to conflictual institutional relationships at local and national levels.

- The low level of education among community members of the natural resources committee leads to the members' limited capacity to identify problems and evolve appropriate strategies to solve them.
- Contrary to the Guidelines, some members of the village government expected also to be members of the village natural resources committee, which could reduce the accountability of the committee to the VG and the General Assembly.
- There is a possibility of non-sustainability of the new wildlife management system if the system becomes over-dependent on donor support in terms of funding.

### **3.0 ECONOMIC ASPECTS**

#### *3.1 Level of Development of the Twatwatwa WMA*

Twatwatwa WMA is still in its initial stages of development. They have developed a programme for management of natural resources to which they are seeking financial support. There is also a natural resource committee for natural resources related matters. The village does not have a CBC but only CBO exists which deals with all development issues in the village, including wildlife. There are no game scouts for patrol or any modalities for controlling poaching and because of this poaching is rampant in the area. However, little is known about the wildlife stock and its related economic and socio-cultural potentials of the area.

#### *3.2 Socio-Economic Infrastructure*

Road transport to Morogoro and Kilosa is of earth and the villagers complain that it is not reliable, especially during the rainy season. The village also does not have enough and clean water both during dry and wet season. Grazing pastures and dams for livestock are not sufficient especially during dry season. Most people use fuelwood for cooking with 2% using also kerosene and charcoal.

The area has two schools, though one is abandoned due to too few children as well as poor roads and infrastructure. There are few shallow wells. There is also a seasonal river called Mgombarenga. During the rainy season they can also utilize the water accumulated

in ponds. During the dry season the villagers depend on River Mkata for water for domestic and livestock use.

### *3.3 Common Diseases and Related Costs*

The common diseases affecting people are malaria; coughing, diarrhea and dysentery. About three quarters of the villagers are reported to have attacked by malaria annually while diarrhea and dysentery affect half of the villagers. Such diseases also are reported to be repetitive where a person may suffer four times a year. The cost of treating malaria were reported to be 30,000 per person and 45,000/= for dysentery and diarrhoea. The village also does not have dip for their livestock. Diseases such as Foot and Mouth Disease (FMD), East Cost Fever (ECF) and dysentery are common for livestock. This suggests that improving health services both in terms of medicine and mosquito nets have the potential of saving people's budget from health services.

### *3.4 Economic Activities*

Twatwatwa village is about 30,830 sq.km. and a population of 3,050 persons most of whom are of the Maasai ethnic group, their main economic activity being livestock keeping. The 1997 census revealed that the village had 74,064 cattle, 10,960 goats, and 5,833 sheep (DWO, 1998).

Although the Twatwatwa dwellers are mainly livestock keepers, they also cultivate rice and maize. It is the only village where oxen ploughing is the dominant technology. On average, each household cultivates 5 ha per season. The rice harvest is 10 sacks per ha and the prices ranges from 9,000/= - 18,000/= per sack during harvest and scarcity, respectively. For maize the harvest is between 10-15 sacks per ha and prices range from 14,000/= to 20,000 for harvest and scarcity seasons, respectively.

This area is highly affected by wild animals. Reports show that between 95-125 ha of maize/rice are destroyed by wild animals annually. The most destructive animals were mentioned to be elephants, baboons, monkeys and wildpigs.

### 3.5 *Access to Markets*

Market accessibility is a problem in Twatwatwa. This is due to the poor transport systems. Few buyers come to buy farm products and due to lack of competition they pay low prices. Twatwatwa production is quite high where 95% of the villagers can produce 100 plus sacks of rice and maize. Nevertheless, the productivity is said to be declining due to drought.

### 3.6 *Sources of Incomes*

Sources of incomes include village levy, fines, cess from petty business, including *minada*. There is also a big support from donor community e.g. Irish Aid and an NGO from Kenya. In 2002 the village government income was Tshs. 11,700,000. The whole money was spent for dam construction. Out of this, income from natural resources was insignificant, amounting to only Tsh. 70,000/= . This is because the proposed WMA has yet to participate in the quota system.

### 3.6 *Non-Farm Economic Activities*

There are two shops in the village, which are not enough. At least all villagers sell some milk for cash. Livestock business involves 10 people and women are involved in beads (*shanga*) making, which they feel could secure a good income from tourists.

Natural resources related business includes game hunting.

### 3.7 *Poverty Levels*

In assessing poverty levels, the Maasai criteria for wealth included cattle of not less than 1,000, 5 modern houses in urban areas, at least four cars, many wives (at least 4) and children (20+). Using these criteria, Twatwatwa village is reported to have 50% poor people. Nevertheless, using standard criteria for poverty assessment, e.g. access to health services, access to clean water, education, life expectancy, under five mortality rates, the poverty levels would seem to be widely spread in the community and are higher than the estimated 50%.

### 3.8 *Consumption Patterns*

The foodstuff commonly consumed in the village includes meat, maize, rice, milk, beans and vegetables. The main staple food is maize, rice and milk. A high proportion of the villages has two meals a day with only 5% of the population having three meals a day (i.e. breakfast, lunch and dinner).

### 3.9 *Land Use Patterns*

Land use pattern comprises land for residential, farming, grazing, conservation and a cemetery. The land is distributed to villagers by the village government.

### 3.10 *The Three Year Development Plan*

The village has a development plan for the following activities in the coming three years:

- Dam construction
- Installation of tape water
- Construction/rehabilitation of cattle dips
- Roofing of a classroom, construction of one house for teachers and to stimulate people on building modern houses.

### 3.11 *Natural Resource Committee*

The village Natural Resources Committee was established in 1999. Since its inception it has encountered a number of problems, including inability to curb poaching mainly due to poor communication facilities, poor transport and working facilities.

Environmental destruction is quite severe in the proposed Twatwatwa WMA, including tree cutting, charcoal burning, poaching of wild animals and destructive fishing (Twatwatwa, 1997). Most of these destructive activities are said to originate from communities outside the Twatwatwa village, which may suggest a need to incorporate them in the management of the pilot WMA.

The achievements listed included:

- A sense of ownership of wildlife by the villagers

- The Maasai feel that the presence of wildlife in their area has provided an optimal habitat and prey ground within the system, which prevents carnivorous animals to come and attack their livestock.

### *3.12 Some Conservation Initiatives*

In 1997 the village government council decided to set up a special committee of 16 people to conserve/manage the environment of Twatwatwa village and the natural resources therein. The village also drafted a plan/programme, upon which they request for loans/assistance from outside stakeholders. The aims and objectives of this plan are to protect and improve this village's environment. By this programme also, the village hopes to put itself in a position to control the harvest of the villages natural resources and in this way to facilitate the population to profit from these products. The village development conservation plan involves:

- Woodland management and tree planting
- Sustainable utilization of land in which they are intending to develop a land use plan into settlement, agriculture, pastoralism and conservation.
- Awareness and training on natural resource management. It will involve the management committee and young people in the village.
- They also intend to reduce the number of destructive wild animals by killing and selling meat to villagers. The village claims not to harvest wildlife currently.
- The village also wishes to indulge in farming and harvesting fish. They plan to buy fishing equipment and coordinate fishing in the Mkata River. Also it will dig five fishponds for fish farming. The aim is to improve nutrition in the village and increase village revenue through prevention of unlicensed fishing.
- They plan to develop village by-laws for environmental conservation.

### *3.13 Economic Potential*

Twatwatwa is surrounded by bush, which contains good timber trees, wildlife, attractive birds and the Mkata River which has a lot of tasty fish.

### *3.14 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 Sport Hunting*

Sport hunting could be potentially another major earner of revenues in the WMA. However, for such activity to be efficient market forces should be allowed for allocation and pricing of hunting blocks.

### *3.16 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

### *3.17 Beekeeping*

Beekeeping and the value added processing and marketing of honey, wax and other products, presents a clear economic opportunity for most villages in the proposed Twatwatwa WMA, both at village and individual levels. However, it is not clear for the Twatwatwa to be interested in such activity since traditionally they are livestock keepers. Beekeeping business is underdeveloped in Tanzania where less than 4% of the potential volume of honey is produced nationally (MNRT 2000). Therefore, improving processing and marketing presents a natural resource based business opportunity for the AA of the

WMA compatible with all other economic opportunities. Beekeeping 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 (NFMP).

### *3.18 Fisheries Management*

As pointed out, the village wishes to indulge in farming and harvesting of fish. They plan to buy fishing equipment and coordinate fishing in the Mkata River. Also the village will dig five fish ponds for fish farming. The aim is to improve nutrition in the village and increase village revenue through prevention of unlicensed fishing. Boosting of fishing industry in the village will provide a diversification source of income and protein. Currently villages depend mainly on beef, goat meat, milk and chicken as major sources of protein.

The planned fisheries management will empower 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, et cetera, and a system of enforcing the rules. It will also provide 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.

### *3.19 Beads for Tourists*

The Maasai women have been involved in bead-making for centuries and they feel that if tourism is promoted in the proposed WMA they could exploit this opportunity for selling their beads to the tourists and earning considerable incomes.

### *3.20 Emerging issues*

There is a tense conflict between the Maasai in Twatwatwa village and crop cultivators in villages surrounding the proposed WMA. This threatens the sustainability of this pilot WMA. Level of knowledge and awareness regarding the new concepts of WMA and AA by villagers, including the village government members, is very low or non-existent.

Most of the natural resources are extracted free of charge because either by-laws are not developed or they are simply not enforceable. The capacity to keep records for income and expenditure by the village government is very poor.

Because of its low development, income from wildlife is not significant nor is the value of the resource base clearly known. Capacity to identify economic opportunities for the proposed WMA is low, which may undermine their bargaining power with investors.

The relationship between the proposed Twatwatwa WMA and neighbouring villages is not good. While Twatwatwa village has been developing wildlife management programmes, the other villages are not aware about that and they claim to have a stake on the proposed WMA.

### *3.21 Conclusion and Recommendations*

Twatwatwa WMA is still in its initial stages of development and as a result most of the activities are not operating, e.g. game scouts and anti-poaching. Nevertheless, the WMA has developed a comprehensive plan for the management and utilization of the resource, which they are seeking for funding support by government and donor community.

Income earnings from wildlife is insignificant accounting to only Tshs. 70,000 per annum. This is because there is no quota allocation for the village. The little they get is from district wildlife office. However, there is no adequate knowledge on the wildlife resource base in the area, which necessitates intensive study for ecology and economic potential of the area.

Fortunately, though record keeping is a major set back income and expenditures by the village government seems to be clear and transparent enough. This has probably been attributed to the fact that all villagers are from one ethnic group, the Maasai, which has a long history of equitable communal resource mobilization and allocation.

Hence we would like to recommend as follows:

- Intensive studies should be commissioned for ecological and economic potential of the area. Also to identify key stakeholders surrounding the village and on how natural resources management and utilization could equitably be shared among them.
- Education also should be extended to teaching people basic principals of project appraisal and book-keeping or general management practices. Field observations show that VG cannot even keep 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. There should be training for VG in record keeping for incomes and expenditures incurred. Also there should be an external board to audit VG incomes and expenditures as provided by the Guidelines.
- Conduct awareness raising on WMA and AA concepts for all the communities surrounding the WMA. This should be followed by capacity building for key players in the VG. Educating villagers on the WMA and associated packages is also important for bargaining power with investors.
- Help villages to develop by-laws for natural resources utilization as an incentive to increase VG incomes and sustainable utilisation of natural resources.
- During the implementation of WMA/AA policies the proposed WMA should be allocated with a facilitator to help them in identifying and implementing economic opportunities.

### *3.22 Way Forward*

The proposed Twatwatwa WMA is in its infant stage of development but it is a very promising WMA. The WMA is mainly for one ethnic group, the Maasai, and they are eager and enthusiastic to develop it. They have drafted a plan and they are looking forward to request for funds to support the effort from external sources. They are positive that the proposed WMA will improve their economic well-being and provide a balanced ecosystem with their livestock keeping life style.

Since there has been no detailed study on the ecological, sociological and economic aspects of the area perhaps this could be the first step for the government to begin with. There should be a comprehensive study of the resource base of this pilot WMA.

The WMA should be helped to develop general management and land use plans. This is undoubtedly important and required first step for better identification of land use patterns and economic opportunities.

On the other hand, the proposed Twatwatwa WMA is threatened by ethnic and land use conflicts. The villages surrounding this prospective WMA are not Maasai and their main activity is agriculture. They feel they have been denied exploiting their natural resources by both the government and the Maasai. While for sure these two communities cannot co-exist in the absence of proper land use plans, isolating them could also threaten the sustainability of this WMA in terms of poaching. The government should look critically on these issues and see how it could resolve and make these two communities live together harmoniously.

Unlike in the other two pilot WMAs visited by the team, the most deficiency observed in the field is the knowledge gap and awareness about the whole idea of WMA and AA by villages. With the exception of the villages' chairmen who attended the inauguration ceremony by the MNRT in Dar es Salaam, a high proportion do not know exactly what is going on and how this type of land use 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 village should be the starting point of WMA implementation by the government, donor community and NGOs. Educating village players on the WMA and associated packages is also important for bargaining power with the investors.

Education also should be extended to teaching people basic principals of project appraisal and book-keeping or general management practices. Field observation show that VG cannot even keep simple records for income and expenditure for their village. Proper

monitoring of the impact of WMAs concept will only be possible if there is proper record keeping of income and expenditure in the villages. Most of the villages also did not know even how they could increase their incomes based on this new policy of WMA. This suggest that at least in the initial years of WMAs implementation each WMA may need to hire facilitators who could help them in implementing and identifying opportunities.

Villages should be given a room to chose what they feel is the best way of utilizing their resources such as meat consumption, hunting, photographing, et cetera. Nevertheless, advice should be given to the villages to optimize the resource utilization. For example, while many villagers have shown a desire of increasing meat supply from wildlife, both logistical and economic indicators show this to be the most inefficient way of utilizing wildlife. The best way could be the selling the entire quota to tourist hunters and part of the income be used to buy cattle for slaughter.

## **4.0 ECOLOGICAL ASPECTS**

### *4.1 Situation Analysis*

The area shares boundary with Mkata Ranch in the East, Madoto Ranch in the West and Rudewa Mbuyuni in the South. The village area is surveyed and the total area is 30,830 ha. Unfortunately no area is specifically set aside as a potential WMA. Villagers have a notion that they can make the whole village land a WMA. This is contrary to the issued guidelines, which require a proper zonation of village/s indicating different uses. However, given the observed situation in the field, if the community agrees to set aside a pilot WMA, the northern half of the area should be given priority for four main reasons:

- e) The area is largely tsetse infested thus might not be very useful for other economic activities
- f) Due to tsetse infestation, there are very few settlements and most of them are temporary. It will therefore be easy remove those settlements and promote wildlife hunting is such an area

- g) The area has a better vegetation coverage and is representative of all vegetation communities in the area. It has therefore the potential of harbouring all animal species and thus maintain the animal diversity of the area.
- h) There is sufficient water throughout the year, as the area is bounded by Wami river on the west, Mkata river on the east and a convergence of the two rivers on the north.

The main foreseeable problem is lack of co-operation with other adjacent communities. If the villages continues to stand alone in this effort, there are risks of losing wildlife corridors, and this may jeopardize the ecological entity of the area.

#### *4.2 Ecological Data and Analysis*

Ecological data for the area is very scanty. Part of the problem is lack of adequate institutional support to organize information scientifically. Most of the support is provided by the District Natural Resources Department, which seriously lack finance, technical and infrastructural capacity to facilitate the process of data gathering.

##### **4.2.1 The current ecological status of the area**

###### **Overview**

Contrary to most proposed pilot WMA's, Twatwatwa area is not bounded by any legally core-protected area. The area, therefore, faces high risks of losing its wildlife if concerted efforts are not made to harmonize land use activities around it. This is particularly so given the nature of intensified land use conflicts in the district. Most areas on the south and southwest are presently heavily cultivated with deforestation taking pace.

The main threat therefore is the continued "ecological viability" of this area. Luckily enough, on the north and northeast the area is bounded by Mkata ranch whose activities are compatible with wildlife conservation. However, the present government policy of privatizing National ranches leaves a lot of questions unanswered to the survival of this area, especially if the "buyers" are going to promote activities that are not compatible to wildlife conservation.

## 4.2.2 Trends and Use of Wildlife

### Trends in wildlife populations

There has never been any deliberate efforts to conduct wildlife censuses in the area. There are therefore no data on the number and distribution of wildlife. Unfortunately, there are no game scouts in the area who could give some indications on the number and distribution of wildlife. However, local communities clearly indicated that the number of wildlife in the area has decreased dramatically due to poaching. Poaching is conducted by nearby communities and poachers from the nearby Morogoro town. There are no well-organized institutional efforts by communities to combat poaching in the area or keep proper records on wildlife trends. It is therefore difficult in this report to give data on the number of wildlife present in the area and the trend compared to previous years.

However, field observations and scanty records available indicate the animal species listed in Table 4.1 exist in the area.

**Table 4.1 : Animal Species Found in Twatwatwa Area**

English Name	Scientific Name
Elephant	<i>Loxodonta africana</i>
Buffalo	<i>Syncerus caffer caffer</i>
Eland	<i>Taurotragus oryx</i>
Wildebeest	<i>Connochaetes taurinus</i>
Lion	<i>Panthera leo</i>
Leopard	<i>Panthera pardus</i>
Impala	<i>Aepyceros melampus</i>
Hunting dog	<i>Lycaon pictus</i>
Southern redbuck	<i>Redunca arundinum</i>
Warthog	<i>Phacochoenus aethiopicus</i>
Common waterbuck	<i>Kobus eliprinunus</i>
Zebra	<i>Equus bruchelli</i>

Caracal	<i>Felis caracal</i>
Velvet monkey	<i>Cercopithecus aethiops</i>
Yellow baboon	<i>Papio anubis</i>
Africa hare	<i>Lepus capensis</i>
Advaak	<i>Orycteropus affer</i>
Porcupine	<i>Hystrix galeata</i>
Stripped jackal	<i>Canis adustus</i>
Golden jackal	<i>Canis aureus</i>
Crocodile	<i>Crocodilus niloticus</i>
Giraffe	

Dominant species among these have been identified by communities as Thomson gazelles, Elephants, Giraffe, Eland, and baboons. The number of baboons is said to be very high and they are becoming a nuisance to nearby communities.

The number of wildebeest and zebra is said to have decreased significantly since 1995. This may be caused by the fact that they are preferred by local communities and poachers due to their carcass weight as compared to other animal species, which are hunted for meat.

There is also a number of bird species found in the area. These include the species listed in Table 4.2 below.

**Table 4.2: Bird Species in the Area**

<b>English Name</b>	<b>Scientific Name</b>
Cattle Egret	<i>Bubulens ibis</i>
Great White Egret	<i>Egretta alba</i>
Grey Heron	<i>Ardea Cinerea</i>
Hammerkop	<i>Scopus umbretta</i>
Saddle-billed stork	<i>Ephippiorhynchus senegalensis</i>
Marabou stork	<i>Leptoptilos crumeniferus</i>
Gloss ibis	<i>Plegadis fakinellus</i>
Egyptian Goose	<i>Alopochen aegyptiaca</i>
Supur wing goose	<i>Rectroptenis gambensis</i>
Ruppells grifon vulture	<i>Gyps ruppellii</i>
Long-creasted eagle	<i>Lophaetus accipitalis</i>
Tawny eagle	<i>Aquila rapax</i>
Helmeted guinea fowls	<i>Numida meleagris</i>
Blacksmith plover	<i>Venellus armatus</i>
Crowned plover	<i>Venellus coronatus</i>
Ring-necked dove	<i>Streptopelia capicola</i>
Emerald-spotted word dove	<i>Oena capensis</i>
Green pigeon	<i>Turtur chalcospilos</i>
Brown parrot	<i>Treron calva australis</i>
White-bellied go-away bird	<i>Poicephalus meyeri</i>
White browed caucal	<i>Corythaixoides</i>
European swift	<i>Apus Apus</i>
Speckled mvusebird	<i>Colius striatus</i>
Melachite kingfisher	<i>Carythonis cristata</i>
Lucal breasted roller	<i>Coracias caudate</i>
Ground hornbill	<i>Bucorvus cafter</i>
Grey hornbill	<i>Tirkus nasutus</i>
Fiscal shrike	<i>Lanius collaris</i>
Paradise flycather	<i>Tersiphone viridis</i>

Red-cheeked cordon-bleu	<i>Uraeginthus bengalus</i>
Red-billed firefinch	<i>Lagonosticta senegala</i>
Bronze Mannikin	<i>Lonchura cocullata</i>
Pin tailed whydah	<i>Vidua marcoura</i>
Reichnows weaver	<i>Ploccus baglafecht reichnow</i>
Red billed buffalo weaver	<i>Weaver bubalornis niger</i>
Yellow bishop	<i>Euplectes capensis</i>
Red billed quelea	<i>Quelea-quelea</i>
Superls starling	<i>Spreo superbus</i>
Drongo	<i>Dicrurus adsmimilis</i>

### **Amphibians and Reptiles**

There are no records of small mammals, amphibians and reptiles. Discussions with local communities indicate that the main amphibians present in the area are frogs and toads. Reptiles include crocodiles, snakes, tortoises, chameleons and lizards.

### **Endemic, Rare, Threatened and Endangered species**

Because of the international concern about the trade in several species and their products, the following large mammals found in the area are placed within the CITES appendices.

Appendix 1: African Elephant and Leopard.

Appendix 2: Hippopotamus and Crocodile

None of the reptiles and amphibians are regarded as endangered under the current IUCN classification of conservation status. Tortoises, chameleons, pythons and crocodile are placed on CITES Appendix 2 because they are regarded to be under threat from the live animal export trade. Snakes are also regarded as dangerous and killed when encountered.

## Use of Wildlife

The only form of utilization allowed legally is resident hunting. Animal species hunted are buffalo, eland, Thomson gazelles and wildebeest. However, illegal harvesting for meat (both subsistence and commercial), seem to be on the increase.

It has been very difficult to get poaching data in the area. However, the following estimates were given as the number of wild animals poached for the last three years.

**Table 3: Number of Wild Animals Poached (2000-2002)**

	Wildebeest	Zebra	Gazelles	Eland	Buffalo
2000	8	3	11	4	2
2001	11	4	14	5	4
2002	12	6	16	7	6

### **4.2.3 The Status of Vegetation Communities and an Assessment of the Suitability of the Habitats for Wildlife**

The vegetation of the area ranges from riverine vegetation to a typical semi arid area. This offers a wide range of habitats to different animal species. These vegetation community types offer a suitable habitat for wildlife, as there is sufficient shade and open areas.

The area is dominated by three major vegetation communities namely Woodland, Open grassland and riverine vegetation.

#### **Woodland Vegetation**

This vegetation type tend to occupy largely the southern and south-eastern part and central part of the village. They tend to get thicker as one moves to the north. Dominant species include; *Salvadora persica*, *Adansonia digitata*, *Hyphene ventricosa*, *Dalbergia melanoxylon*, *Balanites Aegyptiaca*, *Acacia mellifera*, *Acacia tortilis*, *Commiphora Africana*, *Combretum Pubdida*, *Phenex reclinata*, *Acacia negrescens*, *Acacia nilotica*, and *Acacia geradii*.

### **Riverine Vegetation**

This vegetation community is found along Wami and Mkata rivers. They therefore form the northern, western and eastern boundary of the area. The riverine vegetation and the transition zone with other vegetation communities is dominated by *Tamarindus indica*, *Azelia quazensis*, *Milecea excelsa*, *Burkea Africana*, *Khaya Nyasica*, *Acacia xanthophloea*, *Grevia bicolor*, *Kigelia Africana*, *Pterocarpus angolensis*, *Ficus thoningii* and *Steculia apendiculata*.

### **Open Grassland**

These are isolated patches within woodlands. Some open grassland areas are dominated by scattered acacia spp and *solanum incanum* at old boma sites. There is a high rate of regeneration of *Acacia geradii* in the more semi-arid open grassland. This is reducing the area available for plains animals and livestock as well. If this trend continues, there is a risk of losing some species such as wildebeest, which commonly prefer open plains.

#### **4.2.4 The Current Status and Trends in Water Availability for Wildlife**

There are two rivers in the area, namely Mkata and Wami. They have enough water for wildlife throughout the year. There is also a temporary river known as Mgomberenga which retains water during the wet season alone. Declining water levels compared to previous years seems to be a problem.

There are also four man made dams, which are used by both livestock and wildlife. These are Ngoisani, Twatwatwa, Mnazi mmoja and Sangarami. As the main sources of water for wildlife are the rivers, which are at the periphery of the area, these dams seem to be useful for wildlife at the interior of the area.

#### **4.2.5 An Overview of Wildlife Movements**

The status of wildlife movements in the area is largely unclear. However, discussions with communities and some district officials reveal that there is some wildlife movement from the core protected areas of Ruaha, Udzungwa and Mikumi National Parks. There are unconfirmed verbal reports of known wildlife corridors, especially of elephants from

Ruaha National Park to Udzungwa , Mikumi to and from the area. However, communities could not trace exactly on the map those corridors, which are beyond the vicinity of their area. It has also been mentioned that these corridors are increasingly being blocked by cultivation and settlements.

#### **4.2.6 Status, trends and use of fisheries, forest and beekeeping resources and other biological resources**

##### **Status, trends and use of fisheries**

Use of fisheries in this particular village is largely non-existent. Though there are fishing potentials in the two rivers, the community which live in this area does not have a tradition of eating fish. There are very few people, mainly from other tribes who do eat fish. Most fishing activities are therefore done by nearby communities who non-Maasai. It has also been found the type of fishing taking place is at the subsistence level, and if there is any commercial fishing is very much localized. Catfish and tilapia are the main species in the area.

##### **Status, trends and use of forest and beekeeping resources**

In Twatwatwa village, the use of forest resources is mainly confined to building of bomas and firewood. In the nearby villages such as Mbwade, charcoal making activities are on the rise. Main tree species used for charcoal making include *Acacia gerardii*, *Acacia negrescens*, (miluziluzi, fumbili and mwango)-vernacular names. Illegal harvesting of *Afzelia quazensis* for timber has been mentioned as a big threat to the riverine vegetation community.

There are no significant beekeeping activities taking place in the area.

##### **Other biological resources**

There are no other biological resources in the area which are presently being used by communities.

#### 4.2.7 Human-Wildlife Conflicts and Natural Resource Use Conflicts in general

##### Crop Damage

The local community in Twatwatwa is mainly engaged in pastoralism. They also cultivate home-gardens but they complain that most of their crops are destroyed by baboons and elephants. The main crops grown are maize and rice at a small scale.

**Table 4.3: Average Crop Damage by Wildlife**

S/N	ANIMAL SPECIES	CROPS DESTROYED	AVERAGE PER YEAR	TIME OF THE DAY
1	Elephant	Rice/Maize	40 ha.	Night
2	Baboon/velvet monkey	Rice/Maize	55-60 ha.	Daytime
3	Wildpig	Rice/Maize	30-45 ha.	Night

##### Livestock Killings/Attacks

The cases of wildlife attacking livestock are significant. It was reported that;

- in 2001 17 cattle were killed by lions,
- in 2002 7 cattle were killed by lions, and 20 sheep were killed by hyaena, and 7 goats were killed by crocodiles.
- in 2003 2 cattle were killed by lions

##### Illegal Harvesting of Forest Resources

Illegal harvesting of forest resources for timber and charcoal making poses a threat to the future survival of the area. These activities disturb the ecological integrity of the area, thus affecting the suitability of the habitat for wildlife.

##### Wild Fires

Wildfires are ecologically important if they are properly planned. There appears to be a lot of wildfires in the area, and these are caused by poachers and honey hunters. These tend to destroy the habitat as leads to undesired consequences in most cases.

### *4.3 Emerging Issues*

#### **4.3.1 Ecological Viability of the Potential WMA**

As indicated previously, the total village area of Twatwatwa is 30830 ha. If a certain area is to be designated as a pilot WMA it will be slightly less than half of this area. Unfortunately there is no core-protected area which immediately borders Twatwatwa that can be used as a refuge in case of increased human disturbance in the area. With increased human settlements, expanding cultivation around the village, privatization of surrounding ranches and potential changes in land use, the potential WMA is likely to be completely isolated. Increased isolation and size of the area are thus ecological issues which seem to be a threat to the survival of the area.

#### **4.3.2 Blockage of wildlife corridors**

Maintenance of wildlife corridors is essential if the area is to be maintained as a WMA. These corridors cannot be maintained if they are not known and protected legally. Kilosa district is known nationally as an area with full of conflicts in land use, particularly agriculture and pastoralism. That is clearly a sign of land shortage. It is therefore unlikely that these corridors will be protected if deliberate efforts are not taken to protect them. This requires close collaboration among different stakeholders, including local communities, district councils, central government and conservation institutions.

#### **4.3.3 Habitat shrinkage**

Habitat shrinkage in Twatwatwa is caused by both internal and external pressure to the area. Internally, increased human population and associated development is expanding to key habitats for wildlife. External to the area there is an increasing pressure for resources from the area, especially from agricultural communities. These pressures have an impact on the biodiversity of the area.

#### **4.3.4 Intensified land use conflicts**

Intensified land use conflicts, especially pastoralists versus agriculturalists, poses a big threat to the future of the area. These differences normally cause hatred among the

groups, and the attitude that seems to be developing is that wildlife is for the pastoralists. Agriculturalists therefore “hate” wildlife because they destroy their crops, worse still they belong to their “enemies”. Collaboration in protecting wildlife is therefore non-existent. This attitude was observed in the surveys where Pastoral community of Twatwatwa does not want to collaborate with other agricultural communities surrounding their village. Communities in Mbwade village also do not seem to be willing to collaborate with their neighbours in Twatwatwa.

#### **4.3.5 Decreased number of Wildlife Populations**

Though there are no records of trends in wildlife populations, the impression obtained from local communities makes one believe that there is a serious problem of declining numbers of certain wildlife species. A particular case has been mentioned of the wildebeest and zebra. These species are also vulnerable to predators whose number seems to be significant in the area. If poaching continues uncontrolled, and predation levels increase, the number of these wildlife species will continue to decline, and may reach a point of having small populations which are not viable ecologically. This will be a big loss to the potential WMA.

#### **4.3.6 Unsustainable land use practices around the area**

Twatwatwa is village that is surrounded mostly by agricultural communities except in the north and northwest where there is Mkata ranch. At present there are conflicts with agricultural communities in land use. These conflicts are likely to be intensified with the privatization of Mkata ranch, if the investor will change the form of land use to other uses which are not compatible with wildlife conservation.

#### *4.4 Conclusions and Recommendations*

Twatwatwa area is rich in biodiversity and it deserves to be accorded the status of a pilot WMA. However at present there is no technical and financial support to facilitate and guide communities to take the right direction. Strategic efforts should therefore be taken to provide the necessary assistance to this community. There are also a number of problems that have to be addressed in order to improve the efficiency and effectiveness in

managing this area. The following recommendations are therefore important as part of the process to ensure efficient and effective management of the proposed pilot WMA;

➤ **Establish Collaboration with Surrounding Communities**

The village leaders of Twatwatwa are confident that they can effectively manage the area as a WMA without support from the surrounding communities. This is unrealistic given the nature of the area and the complexity of the issues involved. There are issues such as problem animal control, protection of wildlife corridors, control of illegal activities such as poaching and illegal harvesting of forest products and harmonizing bylaws. All these need joint efforts.

It is therefore strongly recommended that these communities be convinced to form an Association for the purpose of establishing a WMA taking into consideration a wide spectrum of the issues involved. They should therefore consider taking on board relevant villages in the process.

➤ **Conduct Wildlife Census**

Prior to the establishment of the pilot WMA or immediately after establishing it, wildlife censuses have to be undertaken to establish a stock of wildlife numbers in the area. This should be followed by institutionalization of monitoring techniques using local communities, in order to establish a database and monitor trends. This will help to give a clear picture of the seriousness of the problem of declining numbers of certain wildlife species as reported by local communities.

➤ **Conduct a detailed Vegetation Inventory and Mapping**

A detailed vegetation inventory and mapping is crucial as a basis for future monitoring. At present this information is missing and it will therefore be difficult to monitor vegetation changes occurring in the area. The problem of bush and woodland encroachment in open grassland should form part of this study so as to develop appropriate strategies for managing wildlife habitats.

➤ **Conduct a Study to Identify and Map Wildlife Corridors**

A broader approach to conservation has to be undertaken if Twatwatwa area is to remain a biodiversity rich area. Among the areas that have to be given priority is the identification and mapping of all wildlife corridors connecting it with other core and dispersal areas. After identifying these corridors, deliberate efforts have to be undertaken to give a legal protection status of these areas. This will require support of the government at all levels.

➤ **Ensure Wildlife Conservation Compatible Activities at Mkata Ranch**

It may be a bit late to deal with incompatible land use practices in some communities surrounding the area given the land use politics in the area. However, it is strongly recommended that all institutions and communities interested in conservation should influence the government to give strict conditions to the selected investor in Mkata ranch to promote activities that are compatible with wildlife conservation. This is the only option available to improve the range available for wildlife within the vicinity of the area.

➤ **Designate a Specific Area as a pilot WMA**

As required by the WMA Guidelines, the village has to be zoned and set a specific area for wildlife management. At present the community is thinking of making the whole village a WMA. This is unrealistic and may cause conflicts with other uses.

#### 4.5 *Way Forward*

The proposed way forward for Twatwatwa community to attain their ambition of establishing a pilot WMA include;

- liaising with the wildlife division to properly understand the procedures required establishing a WMA. At present they do not seem to understand exactly what is required.
- in collaboration with WD, to find facilitators who will assist them financially and technically to follow all procedures as stipulated in the WMA Guidelines

- to establish an Authorized Association to ignite the process and develop strategies for achieving their targets

## REFERENCES

- Boshe, J.I. (1989). Wildlife conservation in the Ngorongoro Conservation Area in Tanzania: Social and ecological implications of increasing pastoralist and declining per capita livestock populations. In: *Mammal conservation in developing countries. A new approach*. Proceedings of a Workshop held at the 5th Theriological Congress in Rome, Italy, August, 1989. Edited by Per Wegge. Development and Environment No. 11, Agricultural University of Norway, pp. 84-100.
- DWO (1998): District Wildlife Office Kilosa Field Progressive Report of the proposed Twatwatwa Wildlife Management Area.
- Ghai, G. (1994). Environment, livelihood and empowerment. *Development and Change* 25(1):1-11.
- Mung'ong'o, C.G. 1995. Social processes and ecology in the Kondoa Irangi Hills, Central Tanzania. Meddelanden series B 93. Department of Human Geography, Stockholm University, 180pp.
- Mung'ong'o, C.G. 1996. Natural resource use conflict resolution in Tanzania. Mimeo.
- Mung'ong'o, C.G. and D. Mwamfupe, 2002. Changing livelihoods of migrant Maasai pastoralists in Morogoro and Kilosa Districts and their impact on the environment. Final Research Report to REPOA.
- Tacconi, L. and J. Bennett 1995. Biodiversity conservation: the process of economic assessment and establishment of a protected area in Vanuatu. *Development and Change* 26.
- VG (1997): Twatwatwa Village Government Council, Twatwatwa Environmental Management Plan.
- Wells, M.P and K.E. Brandon 1993. The principles and practice of buffer zones and local participation in biodiversity conservation. *Ambio* 22(2-3):157-62.

Yanda, P.Z., I.S. Kikula, R.B.B. Mwalyosi and C.G. Mung'ong'o, (2001). The status of game controlled areas as a basis for the establishment of wildlife management areas in Tanzania. The case of Arusha Region. Final Report to Wildlife Division, Ministry of Natural Resources and Tourism. July; 79pp.