Socio-Economic Baseline Assessment of Villages Adjacent to Magombera Forest.




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Front Cover: (Clockwise) Katurukila Woman; Kanyenja Group; Udzungwa Red Colobus[1]; Kanyenja Man
A range of photographs accompanying this report may be obtained by contacting Kilimanyika.
The views expressed in this report do not necessarily reflect those of WWF, CEPF or their associates.

[1] Courtesy Michele Menegon

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Abbreviations and Acronyms

AIG	Alternative Income Generating Activity
CBNRM	Community Based Natural Resource Management
CEPF	Critical Ecosystem Partnership Fund
FAO	Food and Agriculture Organisation
FBD	Forestry and Beekeeping Division
FINCA	FINCA International - provides financial services to poor families
GoT	Government of Tanzania
ICTZ	Intertropical Convergence Zone
IUCN	International Union for the Conservation of Nature
MNRT	Ministry of Natural Resources and Tourism
MTSN	Museo Tridentino di Scienze Naturali
NGO	Non-governmental Organisation
PADEP	Participatory Agricultural Development & Empowerment Programme
PLUM	Participatory Land Use Management
PRA	Participatory Rural Appraisal
RRA	Rapid Rural Appraisal
SACCOS	Savings and Credit Cooperative Society
SGR	Selous Game Reserve
SSI	Semi-Structured Interview
TANESCO	Tanzania Electric Supply Company Limited
TANAPA	Tanzania National Parks
TASAF	Tanzania Social Action Fund
TAZARA	Tanzania Zambia Railway
UNDP	United Nations Development Programme
VFMP	Village Forest Management Plan
VFR	Village Forest Reserve
VICOBA	Village Community Bank
WD	Wildlife Division
WWF	World Wide Fund for Nature
TSh	Tanzanian Shillings[2]

[2] [2] At the time of field research there were Tsh 1,285/= to USD $1.

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Executive Summary

1 Background

Magombera forest was declared a Forest Reserve under the custodianship of the Forest and Beekeeping Division in 1955. At that time the size of the forest reserve was 15km^2 and contiguous with the forest of the Udzungwa Mountains. However agricultural land clearance, particularly commercial plantation development, over the years reduced the forest size to 10km^2. Magombera is the last remaining fragment of ground water forest that once spanned most of the Kilombero valley.

Magombera Forest remains threatened because of its unclear protected area status and lack of proper management. The main threats are currently wood extraction and forest fires which continue to degrade the forest understorey.

There is a growing population of communities living in villages adjacent to Magombera Forest Reserve, of which a large proportion are migrants, attaracted to the area by the fertlile Kilombero valley and the agricultural opportunities it offers. In order to better understand these communities and their relationship to their neighbouring forest, the need for a socio-economic study was identified.

2 Objectives

In December 2004, a stakeholders' workshop was held to identify the conservation values of the Udzungwa Mountains and assess future conservation strategies for the area. This was organised by WWF and a UNDP-GEF project 'Conservation and Management of the Eastern Arc Mountains Forests' and was supported financially by the Critical Ecosystem Partnership Fund (CEPF). During the workshop participants identified a need for action in the conservation of Magombera Forest Reserve (commonly refered to in this document as Magombera Forest).

Following the 2004 workshop, meeting the resource requirements of communities adjacent to Magombera Forest (through land use planning, tree nurseries, income generating activities and environmental education) and providing legal protection of Magombera Forest through legal gazettement to the Selous Game Reserve have been made key to WWF's strategy for the conservation of Magombera. In order to implement its objectives, WWF TPO secured funding from CEPF and this study is one output of these broader objectives.

The main objectives of this study are to document baseline information on household profiles, livelihoods issues and to measure levels of awareness and assess people's attitudes and perceptions in four villages around Magombera Forest, namely Kanyenja, Magombera, Msolwa Station and Katurukila, all in Kilombero District.

This study specifically focuses on the following:

- Assessment of socio-economic conditions including household profiles and livelihoods issues in four villages adjacent to Magombera Forest Reserve.
- Assess of the current level of conservation awareness, particularly on the conservation value of the Magombera Forest Reserve as well as policies and laws governing land and natural resources management around Magombera Forest.
- Identification of capacity limitations and proposition of strategies for improvement.

3 Recommendations

Following the results of the study, the following recommendations are suggested.

3.1 Improving Livelihoods

The following summary steps are recommended for developing increasingly sustainable livelihoods for the villages surrounding Magombera Forest Reserve.

- Complete a land use plannning process for each village which is agreed upon and clearly understood by the villages' leadership and disseminated amongst the village assemblies and appropriate committees. Completion of the process currently being supported by WWF may be sufficient in achieving these ends.
- Investigate and improve the living standard of the communities, by improving current income generating activities as well as in offering alternatives. This may be done through attracting funds for a specific alternative livelihoods study and may be carried out either by WWF or by approaching a partner with specific working knowledge of both the area and livelihoods development. Plan International may be one such partner and may be approached .
- Increase access to loans and provide the education on how to manage them. Communities have a lack of access to credit and limited knowledge of how to mamage businesses involving complex financial management. They may be supported through the implementation of a community based microfinance initiative. Funding for such activities should be sought and partners found with the experience to manage these. Microfinance Institutions already operating in the area such as SACCOS or FINCA may be approached as potential partners or an an advisory level. The development of Village Conservation Banks (VICOBA) may be an output of such activities. Reference to the lessons learnt from the development of VICOBA groups in WWF'scoastal Rufiji-Mafia-Kilwa and Ruaha Water Programmes would be essential in this regard.
- Increase accessibility to education facilities such as primary and secondary schools for the long term social and ecological development of the area. Education is key to understanding the importance of developing a sound understanding of what comprises *sustainable* livelihoods especially in understanding the importance of connectivity between the Selous Game Reserve and Magombera Forest and the benefits ecological integrity wil bring in the long term. Primamry responsibility for increasing access to education lies with the government but there may be opportunities for WWF or specialist NGO partners to continue to improve education levels in the area.

3.2 Increasing Environmental Awareness

The following summary steps are recommended for developing environmental education for the villages surrounding Magombera Forest.

- Developing overall education levels, especially in tree planting and how to manage resources sustainably
- Increasing equipment and tools available to manage tree nurseries and tree planting programmes
- Instigating an element of market economics within the tree planting programme to foster a sense of ownership and sustainability. If the development of tree nurseries can be made into a profitable enterprise there will be an incentive to set

land aside that would otherwise be dedictated to sugar cane by outgrowers or to shifting cultivation in general.

- Establishment of Village Forest Areas (VFR) for each village using the steps highlighted in the Participatory Forest Management (PFM) process. As with tree nurseries, villages may be interested in alloocationg some of their land, as Magombera village already has, to development of VFRs, providing that doing so will be seen as offering sufficient long term economic and ecological gains to not use that land for farming or outgrowing purposes.
- Investment into development of renewable energy supply and continued education about and introduction of fuel-efficient stoves. This is likely best continued by WWF through its current programme of activities.

3.3 Future Management of Magombera Forest

Future Management of Magombera Forest will require the following:

- Selous Game Reserve should formally be given management of the forest since it has considerable ecological importance to SGR (including being a breeding site for elephant) and they have the greatest capacity amongst all the stakeholders to manage it, in fact in a *de facto* sense they are already managing the forest.
- Establishment of a good-neighbourhood programme to link the communities and the SGR authorities is essential. This should include a forest boundary dermacation project to make it clear to all stakeholders where the boundaries are.
- Magombera Forest managers should allow restricted access to the forest for the local communities for activities such as collection of dead wood and grass provided such activities are in agreement and in line with Wildlife Division policies. Authorities should restrict any activities in the forest areas which are highly degraded to allow them to regenerate.

Scope of Study

1 Background to the Study

Magombera forest was declared a Forest Reserve under the custodianship of the Forest and Beekeeping Division in 1955. At that time the size of the forest reserve was 15km^2 and contiguous with the forest of the Udzungwa Mountains. However agricultural land clearance, particularly commercial plantation development, over the years reduced the forest size to 10km^2. Magombera is the last remaining fragment of ground water forest that once spanned most of the Kilombero valley.

Figure 1: Comparison of Forest Cover, Magombera, 1979 (left) & 2004 (right)

Source: Kilimanyika, After Doody (2005) **KILIMANYIKA**

The construction of the Tanzania -Zambia Railway (TAZARA) in the 1970s bisected the forest into the northern and southern fragments which led to removal of the most valuable timber and to agricultural encroachment especially north of the railway. The completion of the railway was followed by the establishment of two *Ujamaa* villages along the railway near Magombera Forest, (Msolwa Station to the East and Katurukila to the West) and consequently more villages were established in the area as natural population growth and migration increased the demand for land and resources.

Acknowledging of its ecological integrity with the Selous ecosystem, in 1980 all authorities agreed that the Magombera Forest should be annexed to the Selous Game Reserve (SGR). To enable annexation, the Magombera Forest Reserve was degazetted in 1982. However, no follow up was made until 1992, when the authorities recollected that the annexation of this forest land to SGR was never legally completed. As a result, the forest is currently not protected. Further, 10 km2 of land between Magombera forest and the SGR, including part of Magombera forest, is owned by Illovo, the Kilombero Sugar Company, although there is a possibility that this land may be assigned to Magombera Forest if agreements can be finalised between Illovo and the Government of Tanzania.

Magombera Forest remains threatened because of its unclear protected area status and lack of proper management. The main threats are currently wood extraction and forest fires which continue to degrade the forest understorey. Ecological research by Marshall amongst others has revealed that timber and pole cutting is occurring in the area, threatening the rare flora and fauna and the overall integrity of the forest particularly the understorey, although the canopy remains largely intact (Marshall, *pers comm.)*.

2 Aims and Objectives of the Study

In December 2004, a stakeholders' workshop was held to identify the conservation values of the Udzungwa Mountains and assess future conservation strategies for the area. This was organised by WWF and a UNDP-GEF project 'Conservation and Management of the Eastern Arc Mountains Forests' and was supported financially by the Critical Ecosystem Partnership Fund (CEPF). During the workshop participants identified a need for action in the conservation of Magombera Forest (Doody *et al*, 2005).

WWF-Tanzania Programme Office has been supporting conservation activities and livelihoods development projects in the Eastern Arc and Udzungwa Mountains for the past 17 years. At the core of their work is the stated aim of restoring and increasing connectivity among fragmented forest patches in the Udzungwa Mountains, of which Magombera is considered a part.

Following the 2004 workshop, meeting the resource requirements of communities adjacent to Magombera Forest (particularly through land use planning and environmental education) and providing legal protection of Magombera Forest through legal gazettement to the Selous Game Reserve have been made key to WWF's strategy for the conservation of Magombera. In order to achieve its objectives, WWF TPO secured funding from CEPF and this study is one output of these broader objectives.

The main objectives of this study are to document baseline information on household profiles, livelihoods issues and to measure levels of awareness and assess people's attitudes and perceptions in four villages around Magombera Forest, namely Kanyenja, Magombera, Msolwa Station and Katurukila, all in Kilombero District.

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3 Structure and Method of the Study

3.1 Overview of Structure

The report begins with the Context & Literature Review which introduces the geographical and historical context of the study and some of the issues and theoretical arguments influencing and surrounding the research topic. It is intended as a contextual background to the research, and therefore does not go into particular detail.

The Magombera Livelihood Strategies section gives information and insight on household profiles and community approaches to maintaining their livelihoods including understanding economic activities being carried out in the area. The section also includes; the level of community dependency on the forest and other natural resources, the state of village land use planning processes and an understanding of how communities view the forest reserve and its boundaries.

The Environmental Awareness section profiles the level of conservation awareness among community members particularly on the value of the Forest Reserve, applicable policies and laws governing the forest reserve. It also provides summary recommendations on the future development of an environmental awareness/training programme for communities in the four surrounding villages and highlights capacity needs in terms of awareness creation, training and provision of extension services

and monitoring of different community programmes and areas of potential synergy with other organisations.

The Management of Magombera Forest section assesses the attitude and perception of communities relating to different management options for the forest, particularly its potential annexation to the Selous Game Reserve.

The Recommendations section offers summary recommendations related to the sections above. Further detail on the methodologies used, as well as a sample questionnaire and checklist, can be found in the appendices.

3.2 Outline of Methods

Quantitative data was gathered through questionnaires given to 158 individual respondents (see *Appendices 2 and 3*). The data presented includes household profiles, resource ownership, standards of living and the livelihood priorities. Qualitative data was gathered by interviewing 160 people using SLA approaches in which one discussion group was held per village with a balance of male and female participants. This method of gathering qualitative data was chosen because it uses participatory and targeted research methods to gather objective viewpoints of different groups within a certain society. It is a method very much based on the perceptions of the respondents rather than on the positions of external stakeholders, and as such may be either subjective or factually incorrect, but nonetheless is an expression of the true stated position of the respondents.

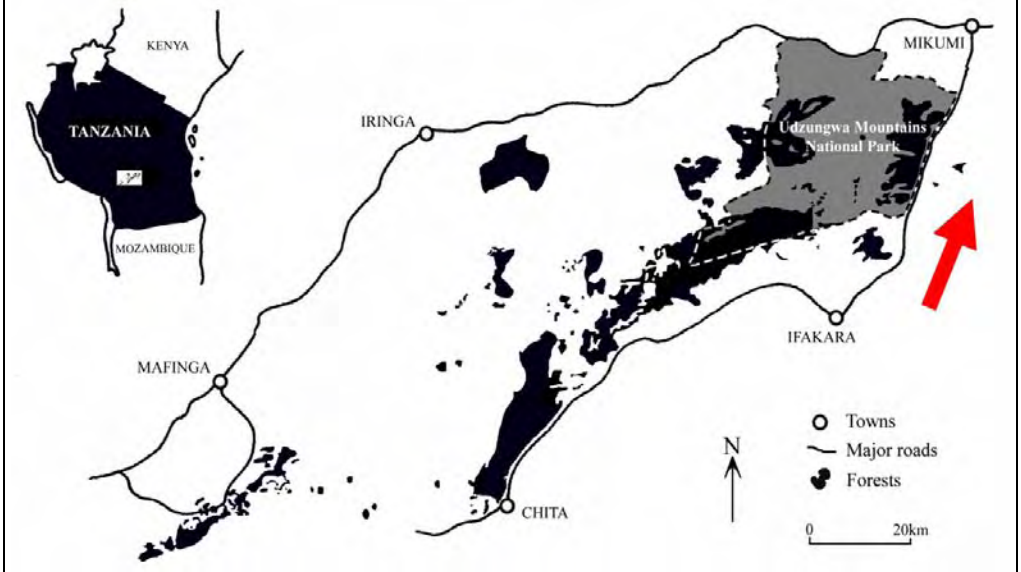
Context & Literature Review

1 Geographical Context

1.1 Location

The densely forested Udzungwa Mountains in Tanzania's southern highlands are internationally recognised as an area of rich biodiversity and a hotspot for a range of unique endemic species. Approximately 6 km to the east of these lie the Magombera forest, situated in the Kilombero Valley at 286 m above sea level. The forest is partially contiguous with the western border of the Selous Game Reserve and close to the south-west boundary of Mikumi National Park.

Figure 2: Udzungwa Mountains Showing Magombera to the East



Source: Kilimanyika, After Doody (2005)

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1.2 Climate & Rainfall

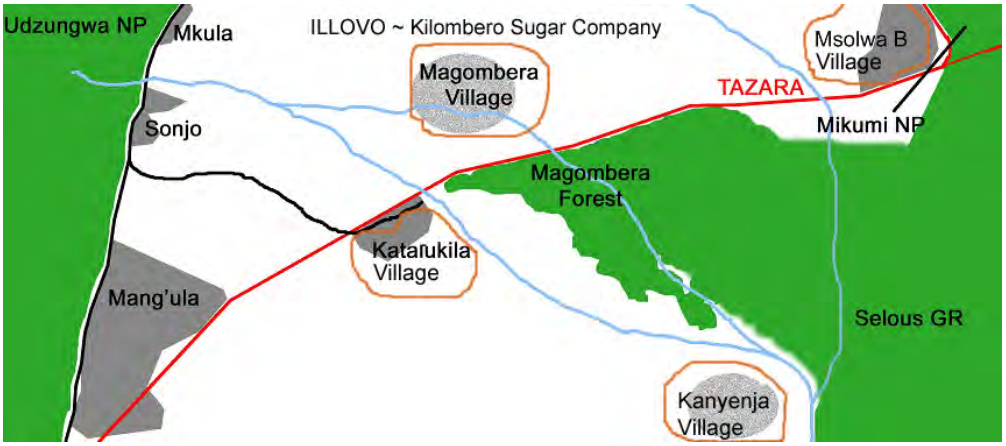
The Udzungwa Mountains forests play an essential role in water catchment, supplying water for agricultural and domestic usage in the lowlands. The Udzungwa Mountain range and its forests also generate a microclimate that increases rainfall in the area. The vast majority of agricultural production in the Kilombero Valley is dependent on the rainfall and terrestrial water supply from the Udzungwa forests (Doody *et al*, 2005).

Rainfall is seasonal and variable in the region, and relatively abundant compared to the country as a whole. Rainfall is bimodal, produced by the movements of the Intertropical Convergence Zone (ITCZ). The ITCZ produces two wet and two dry seasons near the equator, with rainfall seasons occurring from March to April and from October to December when the ITCZ moves overhead. However, partly because of the climatic influence of the mountain range, and the proximity to the Indian Ocean, rainfall is often uninterrupted from October through to March in this region. Rains came early and were heavier than usual during the first half of 2007, causing man farmers heaving losses due to leaching and run off, being able to plant because of waterlogged smallholdings.

2 *Study Settlements*

The study focuses on four villages surrounding Magombera Forest, namely Katurukila, Magombera, Msolwa Station and Kanyenja.

Figure 3: Magombera Forest and Surrounding Villages



Source: Kilimanyika, Adapted from Doody (2005) KILIMANYIKA

2.1 Division of Respondents by Settlement

The following table shows the division of respondents by settlement for both qualitative and quantitative studies carried out. With individual questionnaires, 52.5% of respondents were male and 47.5% female. For discussion groups, 47% of respondents were male and 53% female.

Table 1: Division of Respondents by Study Settlement

	Qualitative Research		Quantitative Research	
Village	**Male**	**Female**	**Male**	**Female**
Katurukila	20	22	22	17
Magombera	17	21	19	19
Kanyenja	20	20	22	19
Msolwa Station	18	22	20	20
Total	**75**	**85**	**83**	**75**
Percentage per Gender	**46.9%**	**53.1%**	**52.5%**	**47.5%**

Source: WWF/Kilimanyika Research KILIMANYIKA

3 Literature Review

3.1 Population Growth

The population Kilombero District are growing at a considerable rate, estimated at 3.4% a year. There are over 10,000 people living in the villages adjacent to Magombera Forest (GoT, 2002).The growth of population in these areas is having a increasing impact in diminishing the amount of natural resources available.

3.2 Socio-Economic Research

Little recent socio-economic research has been carried out in communities relating to natural resource management on Magombera itself. However, the following overviews socio-economic research carries in forest-adjacent communities in the Udzungwa Mountains.

A five month study of the communities living to the eastern side of the Udzungwa Mountains National Park was carried out by Hoyle (1997). The study looked at 14 villages, examining their socio-economic characteristics, their resource requirements, attitudes to TANAPA and the effectiveness of a WWF funded agroforestry/tree planting programme attached to the TANAPA Community Conservation Service at UMNP. The study identified shortfalls between the supply and demand for natural resource products. In particular the lack of alternatives for fuelwood other than from the neighbouring forest, i.e. from within UMNP. The study also revealed the lack of anything beyond basic health and education facilities and the low level of income (subsistence level) gained from the core livelihood activity of cultivation of rice and maize crops. The study raised concerns about a lack of involvement by the community in tree planting due to lack of land, insecurity of land tenure, lack of awareness and lack of incentives. The study recommended improving the degree of extension work and addressing the sustainability of tree nurseries.

A further WWF study (IRA-UDSM, 2000) assessed the impacts of UMNP on agro-industrial developments in Kilombero valley and indicated the impact of poverty causing increasing environmental degradation. This was followed by a TANAPA-WWF socio-economic study (2004) involving communities and local businesses. 4 villages were chosen from the western side of UMNP and 8 from the east. The study indicated the low educational levels in the area and indicated the difficulties of raising awareness of new ideas or innovations with a poorly educated population. The 2004 study also found a high level of awareness amongst communities about conservation activities, however, recommended a need for education and awareness raising campaigns, as well as greater community participation in natural resources management.

Harrison (2006a), in a study of forest resource use and management options for the Udzungwa Mountains range in 15 forest adjacent villages reported the following:

> *The densely forested Udzungwa Mountains in Tanzania's southern highlands are internationally recognised as an area of rich biodiversity and a hotspot for a range of unique endemic species. Besides this biological importance, the forests are crucial as a water catchment area. They also contribute significantly to the livelihoods of a large population who are reliant on forest resources, as well as affecting the economic development of the country as a whole, particularly as the source of vast volumes of water utilised in hydro-electric power generation and irrigation. It is therefore crucial to find management regimes for the area which support the common good whilst acknowledging the socio-economic and cultural realities of communities within the area….*
>
> *…The communities living adjacent to the forests under study are neither asset-rich nor self-sufficient enough to not have to rely on the forests to some extent for both their basic needs and for income generation activities. In particular, the communities rely to a significant degree on the forests for their energy sources, for which there are few alternatives, and if there were, such as mains electricity, it is doubtful that they could afford to pay for it with*

their current level of incomes. The forest, both its timber, and non timber products have real value for communities. They have a market value and a socio-cultural value. If communities lose access to the forests, even to a relatively low level of utilisation, they will become economically and culturally poorer. Further, communities rely on their neighbouring forests for survival to a greater degree during hard times such as drought. (Harrison, 2006a)

A further study by Harrison of nine villages in Kilosa District, (2006b), which incorporated a socio-economic monitoring plan for 29 villages in Kilosa and Kilombero Districts reported the following selected key findings:

Agriculture is the principal livelihood activity generating food and income and is essential to peopled survival. Agriculture brings in food for everyone and money for most…. Secondary activities are also important as people cannot live on farming alone…People perceive their surrounding natural environment as being a source of natural capital. The level of direct dependency on natural assets by communities from all sample villages is highly significant….

….Social and economic aspects of life are both dependent on natural resources in the area under study and are market driven. In the difficult periods prices for goods are driven low due to the lack of ability to pay. In the good times, post harvests, prices for goods are driven high as people have more money to spend and are willing to pay. Likewise, with harvests, times of plentiful harvests see a drop in prices for the particular crop recently harvested. In difficult times, prices for forest products like firewood or charcoal rise, especially when issues of scarcity are also brought into play….

….The negative impact on natural resources is accelerated when people have no income, or worse no food, and look to the forests and nature for last chance support. The basic realities of supply and demand are prominent market forces dictated by seasonal change which in turn dictate people's response to their environment. Any future interventions, whether of alternative fuels or alternative income generating activities must therefore take into account the place they must fit into the dynamics of the marketplace as well as the influence they are likely to have on that market, positive and negative (Harrison, 2006b).

Harrison (2006b) recommended the following steps be taken in better management of natural resources by communities.:

- Building Capacity of Village Natural Resources Committees
- Widespread Environmental Education and Awareness
- Initiating of Village Environmental Scouts
- Village and Local Area Tree Planting
- Development of Alternative Fuel Energy Sources
- Development of Income Generating Activities
- Support of Community Initiated Projects
- Land Use Planning
- Formulation and Enforcement of Bylaws relating to NRM
- Development of Village Forest Reserves

3.3 Inclusion of Magombera Forest into Selous Game Reserve

Propositions for Magombera Forest to be formally gazetted into SGR have been put forward by a wide range of proponents, (including; Rodgers, Homewood & Hall (1979 & '80), Struhsaker & Leland (1980), Decker (1992), Kirenga (1992), Baldus (1992 & 1993), Hoffman (1995) and Mittermeier et al (2002); from Doody *et al*, 2005) , the details of which are not within the scope of

this report. However, suffice to say there is a considerable consensus that Magombera Forest's future lies in its completed annexation to the Selous.

3.4 Key Ecological Importance

According to Marshall (in Doody *et al*, 2005; *pers comm.*), Magombera Forest is of key ecological importance for the following reasons:

- It is the last remaining closed canopy forest in Kilombero valley east of Udzungwa
- It hosts several endemic plants and one amphibian of restricted range
- Home to approximately 1,000 Udzungwa Red Colobus
- It is a habitat of groundwater forest, montane forest & restricted range birds

It is a refuge for large animals (elephants, hippos, buffalo) including, crucially, being a breeding site for elephants from SGR.

Magombera Livelihood Strategies

1 Household Profiles

Household profile

A total of 158 respondents were interviewed using quantitative questions. Each respondent represented a single household. There were an average number of 5.7 people per household, comprising an average of 3.2 children and 2.5 adults.

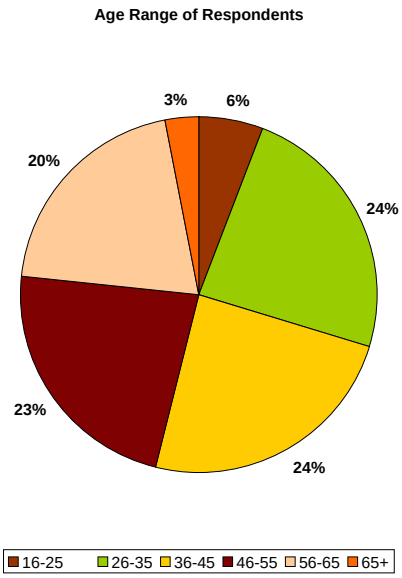
Table 2: Average Number of People per Household	
Adults	2.5
Children	3.2
Overall	**5.7**

Source: WWF/Kilimanyika Research KILIMANYIKA

1.1 Age Range of Respondents

The most common age group of respondents was between 26-35, 36- 45 and 16-25 years old, although there were representatives from across different age groups interviewed.

Table 3: Age Range of Respondents



Source: WWF/Kilimanyika Research. KILIMANYIKA

1.2 Household Heads & Gender Balance

Although 47% of the respondents were female but only 13% of heads of households were female. This indicates that the majority of the community living in the area are dominated by men. Of the female heads of household, the majority were married and a significant number either not yet married or widowed. It was anticipated that the number of females heading households would be lower in

proportion to men because the communities in which this research were carried out consider themselves to be largely patriarchal.

Table 4: Marital Status of Female Heads of Household

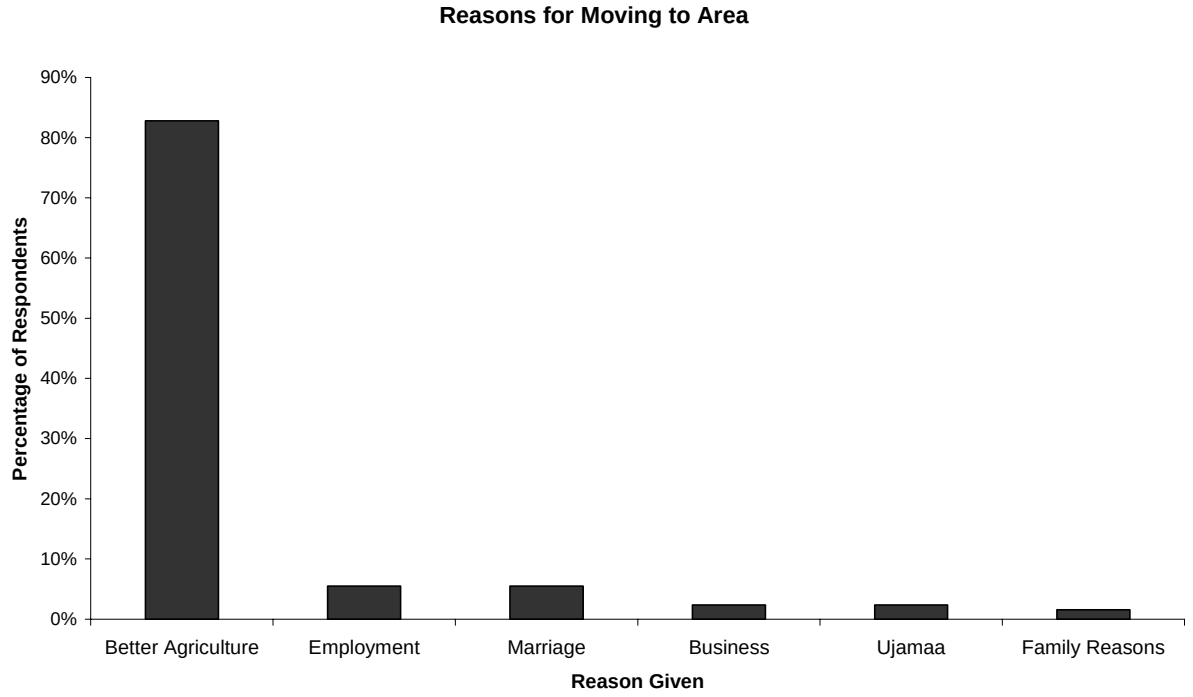
Not Yet Married	23%
Married	15%
Divorced	46%
Widowed	15%

Source: WWF/Kilimanyika Research KILIMANYIKA

1.3 A Population of Migrants

A staggering 82% of respondents stated they were not born in the village. The most common areas in which people had migrated from were Iringa, Kilosa, Mahenge, Morogoro, Njombe, Songea and Ulanga. People have been migrating to the area since the 1940s, however it was in two decades in particular, the 1970s and the 1990s, when most of the migration took place. The years since 2000 have also seen a considerable influx of people to the area. This is a high percentage of migrants and consequently an assessment was made, revealing the following results.

Table 5: Reasons for Moving to the Area



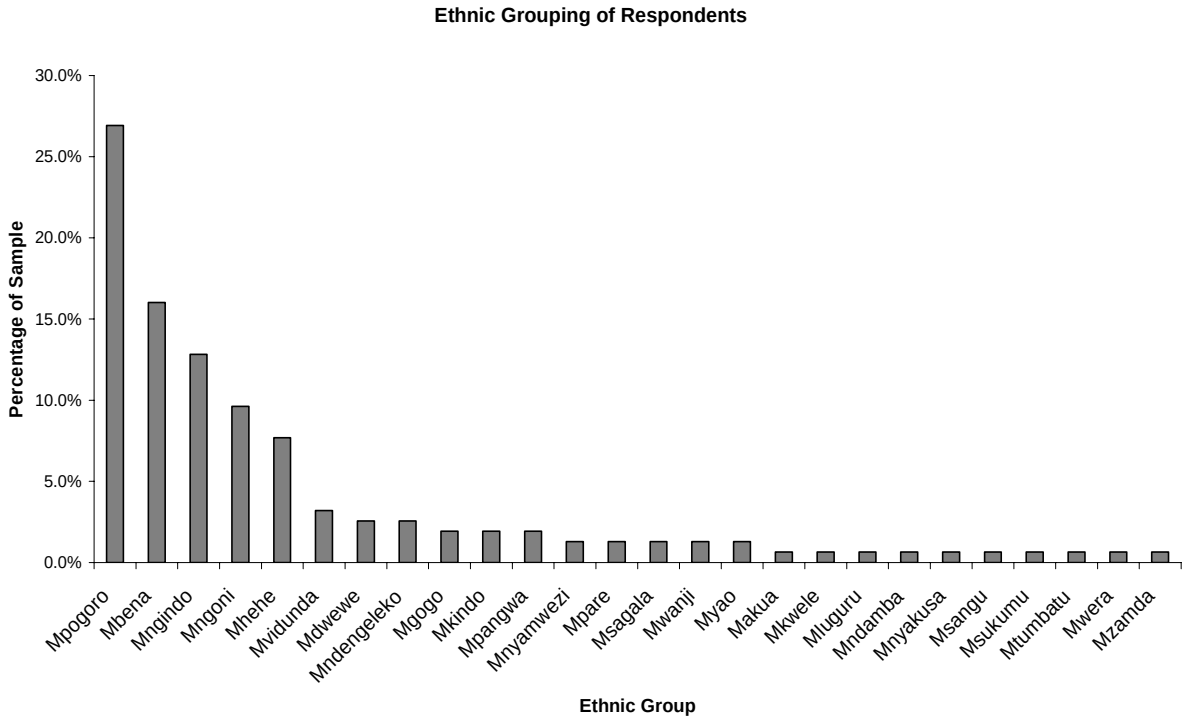
Source: WWF/Kilimanyika Research KILIMANYIKA

Better agricultural prospects are the most common reason to migrate to the area, indicating the highly fertile reputation that the Kilombero valley is widely known for.

1.4 Ethnicity

The majority of the population are not native to the area. Most of people have migrated to the area either recently or over generations from a range of ethnic groups particularly Wapogoro, Wabena, Wangindo and Wangoni.

Table 6: Ethnicity of Respondents



Source: WWF/Kilimanyika Research

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2 *Access to Assets*

Livelihood assessments in each village allowed the research to define the assets (also referred to as types of capital) as perceived available to communities of each village. Assets were divided into the following categories: *Natural* (nature, environment), *Human* (skills and capacity), *Physical* (services and infrastructure), *Social* (community) and *Financial* (access to savings and credit). Refer to the *Methodology* for more detailed definitions.

Table 7: Access to Assets

Village	Natural	Human	Physical	Social	Financial
Katurukila	Land, forest, plain land, Rivers, Wild animals, Mining, Clean Air and different species of birds, Mountains.	Small businesses, Agriculture, livestock keeping, Carpentry, drums making, Building of houses, Carvings, weaving, making of bee hives, vegetables gardens, food cooking.	Roads, railway stations, Celtel, Vodacom and Tigo networks for communications.	Beekeepers working group, Sugar cane grower association, Livestock keepers, Giving each other group (Kufa na kuzikana)	Helping each other groups (kufa na kuzikana)
Magombera	Land, rivers, Wild animals, forest, Valleys, Mountains, Landscape.	Farmers, Carpentry, Livestock keeping, Pot making, Weaving,small business, Local brew makers, teachers, Traditional healers, Nurses, Bricks makers, bicycles repairs.	Railway(TAZARA), Communications network(Celtel, Tigo and Vodacom) and poor road net work.	Helping each others working group, Vegetables farmers associations.	Sugar cane association, Vegetables farmers group.
Msolwa Station	Land, rivers, Mining, Wild animals such as (Rhino, Elephant and lions), forest, Clean air, Plain lands, Valleys and hills.	Weaving, Farming, Carpentry, Fishing, Livestock keepers, Bicycle repairs, Blacksmiths. Potters.	Poor road network, Railway station, Communication network(Celtel, Vodacom and Tigo).	Small business, Livestock keepers group, Sugar cane grower association	Helping each other groups.
Kanyenja	Land, trees, Rivers, Wild animals, Stones, Mining and grasses.	Traditional healers, Carpentry, farming, bicycles repairs livestock keepers,	Poor road network, Communication net work such as Celtel, Vodacom and Railway.	Organised working groups e.g. Ari Mpya, Chimba chimba, Mshikamano, Kukuruka and Vumilia- all are dealing with Agriculture.	Organised working groups.

Source: WWF/Kilimanyika Research KILIMANYIKA

3 Physical Assets

Most community members considered themselves to have very little infrastructure in their villages. People blamed their road network for limiting their trading opportunities and their access to social services. Kanyenja has the greatest difficulty accessing the Ifakara-Mikumi riad than other villages, although they recognise that the support of Selous Game Reserve in building a simple road for them has been considerably helpful. All villages are accessed by dirt roads, some which pass through Illovo, the Kilombero Sugar Company. However, all villages, especially those closest like Msolwa Station, recognised the great advantage that having the TAZARA railway brings them in terms of transport access and trading opportunities.

Communications by mobile telephone are becoming more common and are revolutionising the way people stay in touch for those that feel they can afford it and keep their phones charged. Operators such as Tigo, Vodacom and Celtel are found to different degrees across the study area although the network strength and reliability varies.

Social Services vary by village but at least one primary school is found in every village, and secondary schools in at least every ward. Dispensaries are less common but there is usually one per village. The problem is however that they are not often staffed and are typically short of medicines.

There is very little in terms of equipment or technology to support village development available. Most villagers have access to a milling machine for grinding maize and other products, these are usually privately owned. Tractors and personal vehicles are very uncommon. Katurkila has access to solar supply for charging mobile phones while Msolwa Station has a generator.

3.1 Housing Conditions

Brick housing is increasingly common. 54% of responses indicate houses are made of firewood burnt bricks although only 1% of the responses suggested houses are made of rice husk burnt bricks. This illustrates that only few people know and are ready to use the alternative energy means in brick burning. Additionally, the majority responded that rice husk produce low quality bricks compared to bricks burnt by firewood.

From responses given, about 33% of houses are made of stick/poles, this indicates the dependence of the forest on obtaining buildings materials and the need of increasing awareness on the use of rice husks burnt bricks as an alternative for houses constructions. 12% of responses given indicate walls are also made of mud although none use cement blocks.

Table 8: Type of Wall, as an Overall Percentage

Wall Type	Sample	Percentage
Firewood Bricks	89	53.9%
Sticks/poles	54	32.7%
Mud	20	12.1%
Rice Husk Bricks	2	1.2%
Cement Blocks	0	0.0%
	165	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

Most people live in brick built houses with iron sheet roofs. However a significant number of community members live in grass or *makuti* thatch roofed houses with either sticks/poles walls. The increasing prevalence of brick and iron sheets indicates a permanence of settlement.

Table 9: Type of Roof, as an Overall Percentage

Roof Type	Sample	Percentage
Grass	94	56.6%
Iron sheets	59	35.5%
Thatch	9	5.4%
No roof	3	1.8%
Mud	1	0.6%
Tiles	0	0.0%
	166	**100%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

3.2 Source of Electricity/Light

According to 93% of household responses, most people use lamps to light their homes after dark and very few people use solar and generator to light their houses. Fewer than 5% of the responses indicate the complete lack of electricity or lamps suggesting some people only use fuelwood to light their houses. From the responses, none of the sample has electricity from TANESCO.

Table 10: Source of Electricity/Light per Household

Source of Electricity	Sample	Percentage
Lamp	141	92.8%
None	7	4.6%
Batteries/Solar	3	2.0%
Generator	1	0.7%
TANESCO	0	0.0%
	152	**100.00%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

3.3 Transport

Bicycle is the most common form of transport in both villages (according to 83% of responses). Bicycles are also used for transporting crops from farms to home and to the market and this is possible due to the nature of the terrain, where most of the areas are easily accessible by bicycles except the mountainous areas. A significant minority (14% of responses) have no means of transport.

Table 11: Type of Transport per Household as a Percentage

Private Transport	Sample	Percentage
Bicycle	151	82.5%
None	26	14.2%
Motorbike	2	1.1%
Local Bus	2	1.1%
Cart	1	0.5%
Tractor	1	0.5%
Car	0	0.0%
	183	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

None of the community members own cars; when there is a need of travelling a long distance local buses are available in Mang'ula or Ruaha towns. Few people own motorbikes and those that do work on a contract basis on sugar cane plantations or are government or NGO employees.

4 *Water Issues*

4.1 Source of Water

Rivers and water channels dissecting the villages are the main primary sources of water to the majority of respondents. Most (70% of responses) obtain their water locally from rivers and channels. A significant proportion (26% of responses) have access to private wells but very few people own pumps or in-house plumbing due to high costs involved.

Table 12: Source of Water for Household Use

Source of Water Supply	Sample	Percentage
River/Community Well or Pump	114	70.4%
Private Well	42	25.9%
Forest Reserve	3	1.9%
Private Pump	2	1.2%
In-house plumbing	1	0.6%
In-house tank	0	0.0%
	162	**100%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed

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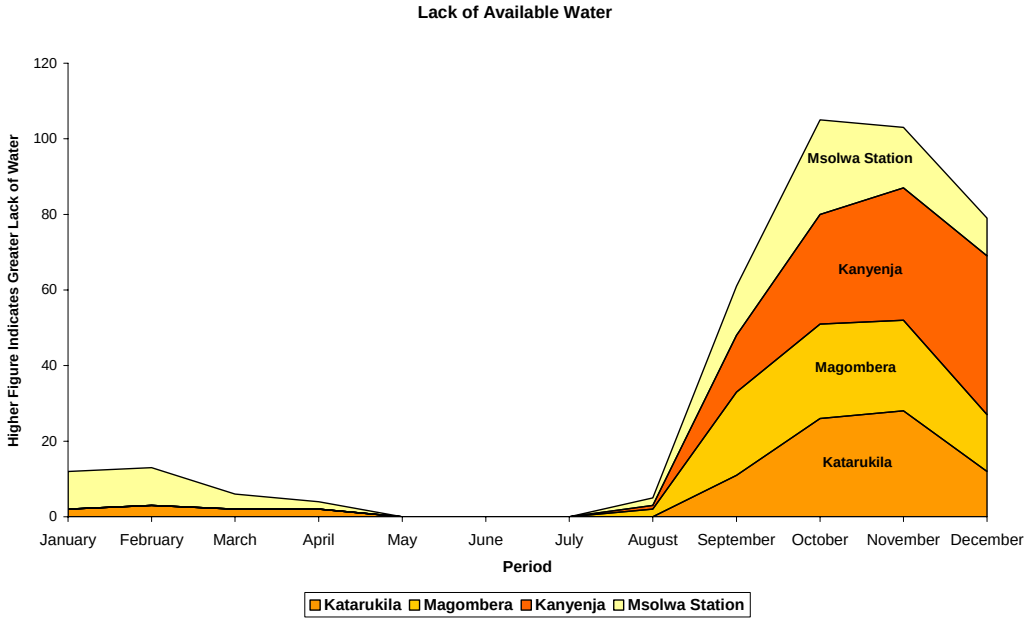
4.2 Water Supply

Water supply in both villages is not a major problem; respondents indicated that plenty of water is available from the beginning of the long rains *(Mvua za Masika)* which are from March to May and water supply is continuous throughout June, July to August. From September to December there is a shortage of water and the situation is made worse if they don't receive the short rains (*Mvua za Vuli)*. January and February is a usually a difficult time of the year if there is water scarcity in the villages.

Table 13: Perceived Availability of Water Throughout the Year



Source: WWF/Kilimanyika Research.

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Water pumps help ease the water shortage situation. For example, in Kanyenja village, villagers use communal hand pump as main source of water of which water is only available during the wet season.

Figure 4: Community water-hand pump in Kanyenja Village

Source: Kilimanyika

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5 *Land and Home Ownership*

There are an overall average of **3 acres** of land per household. Because of the lack of land use planning in most sample villages, many individual household may not own their land formally. However in a *de facto* sense many so do, and certainly perceive so, with 59% of responses indicating that they have their *own* land. The majority of the community members don't know about title deeds, however in the questionnaire, one person stated they had a title deed. This was not verified and is likely to be not true.

5.1 Land Ownership

Land ownership is more common than land renting because the majority will have been allocated land by the village government, their kin or other inhabitants rather than having to rent from one-another.

Those who own their own land have an average of 4 acres per household. For those that rent privately, the amount is less at 2 acres, because of the associated costs, and for those that borrow, the average is 3 acres.

Table 14: Degree of Land Ownership

Land Ownership	Sample	Percentage
Own Land	96	58.5%
Rent Land Private	43	26.2%
Borrow Land	16	9.8%
Rent Land Village	4	2.4%
No Land	4	2.4%
Title Deed	1	0.6%
	164	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

Home Ownership

A vast majority of 98% of responses indicate home ownership is the most common form of tenure. Renting or staying in family homes is uncommon.

Table 15: Degree of Home Ownership

House Ownership	Sample	Percentage
Own House	152	97.4%
Rent House	3	1.9%
Family Members house	1	0.6%
	156	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

Alongside their main home, nearly a third of households have a second house on their land, often for extended family: the ratio of households to houses is **1:1.27**.

6 *Human Assets*

6.1 Skills

As the *Assets* table shows, depending on the size of the village, there was generally considered to be a broad range of skill-sets carried by community members. These are both generic skills and skills which apply specifically to each gender related to areas in which each gender group has specific expertise. As a rule, women are more involved in small business than men, who tend to be better skilled in artisanal trades such as carpentry or building. However women also have specific skills in artisanal work such as in weaving or pottery.

Arable and livestock farming along with a little fishing are the areas in which all villages studied have the greatest skills and experience base. Typical artisanal activities include weaving, carpentry, masonry, lumbering, potting, indigenous healing, blacksmithing and mechanics.

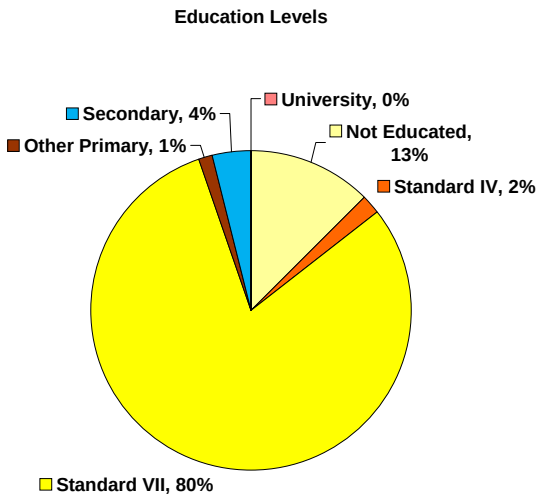
Small business activities are on a low level for the majority. For those that engage in small businesses the most common are vegetable selling, kiosks, small restaurants, local shops and hiring out grinding machines for maize and other crops.

However, because of low levels of education, limited infrastructure, lack of capital and limited opportunities in general, the skills sets of the communities in general remain limited to carrying out activities which they are familiar with and that do not usually bring in incomes of significance. Expanding the skills and experience of people into different activities such as tourism if it becomes a viable proposition will increase their opportunities to develop economically over time.

6.2 Education Levels

In all the four villages, education levels are low for the majority of the communities. An overwhelming 96% of respondents either have had no education at all or only have primary level education to different degrees. The majority are educated to Standard VII. The reason for this has been a lack of insufficient education facilities in the past and difficulty accessing education in the rural areas.

Table 16: Community Education Levels



Source: WWF/Kilimanyika Research.

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During livelihood discussions, the majority of the communities responded that they have only one primary school in the village which is in most cases is located in the village centre and it becomes very difficult for those who are away from the village centre to send their children's to school considering the occurrence of wild animals to and from school. This increases the fear of sending children a long distance to attend school lessons. Secondary school is an issue in these villages, although there is one recently established secondary school at Msolwa Station village which is under the ward level, but this is not enough for all pupils in the area.

All respondents stated that there is also an additional issue of lack of funds to send their children to schools, particularly far from home. However, it is notable that the majority of the community members believe their children are now getting better opportunities as the education system in recent years following the advent of free education.

The implication of low education levels mean it is often difficult for people to grasp and develop new ideas. It is difficult people to take the imitative in seeking new opportunities and to understand broad concepts such as the importance of sustainable management of natural resources. Consequently any future education programmes need to take a relatively simplistic approach at least in the primary phases of any such programme.

7 Social Assets

Social assets are those resources which are derived from a strong sense of community and a spirit of cooperation in both developing economically and in supporting weaker members of each community.

7.1 Level of Cooperation

Cooperation takes many forms, including in cultural and religious life and is clear to see in the existence of different forms of formal and informal groups. It is common to find groups, either of male or female or a mix of genders. The fact that there is cooperation found in various forms in theses villages indicates that the development of groups will be possible in future.

7.2 Groups

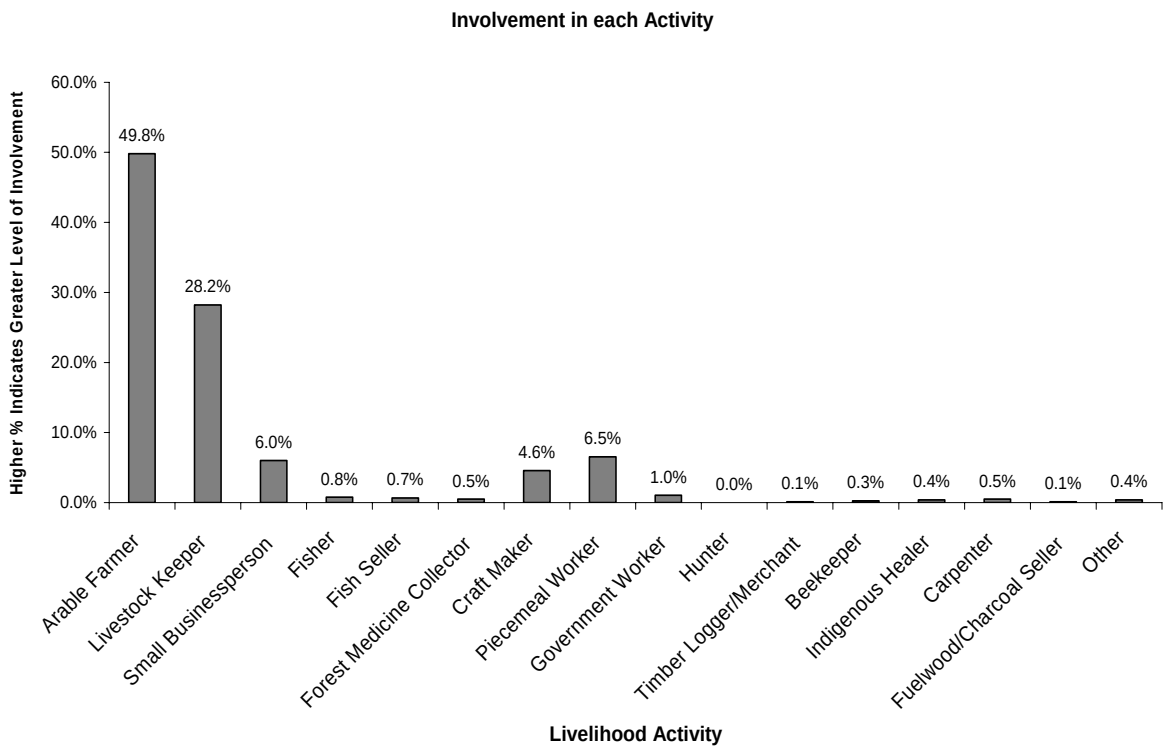
Groups are usually ways of helping each other or for increasing income generation opportunities. As the Assets table shows, groups formed in Magombera Forest-adjacent villages are generally either for social cohesion or are agricultural development, illustratiiong the considerable importance agriculture has to the economies of these villages.

The existence of groups suggests a sprit of cooperation is present in the study villages and may be enhanced and developed in respect to future developmental programmes that may be implemented in these villages.

8 Livelihood Activities

Agriculture is the most important livelihood activity in the villages, it brings food and money and the majority of people are involved in it, followed by carpentry, livestock keeping and small business.. Looking at the overall percentage of people involved in all stated livelihood activities, arable farming is the most common activity with 50% of all responses. Livestock farming is second most common, with 28% of responses. Of lesser, but significant importance are the secondary activities of small business, craft making and piecemeal labour. Involvement in other activities is a relatively insignificant number.

Table 17: Level of Involvement in each Livelihood Activity

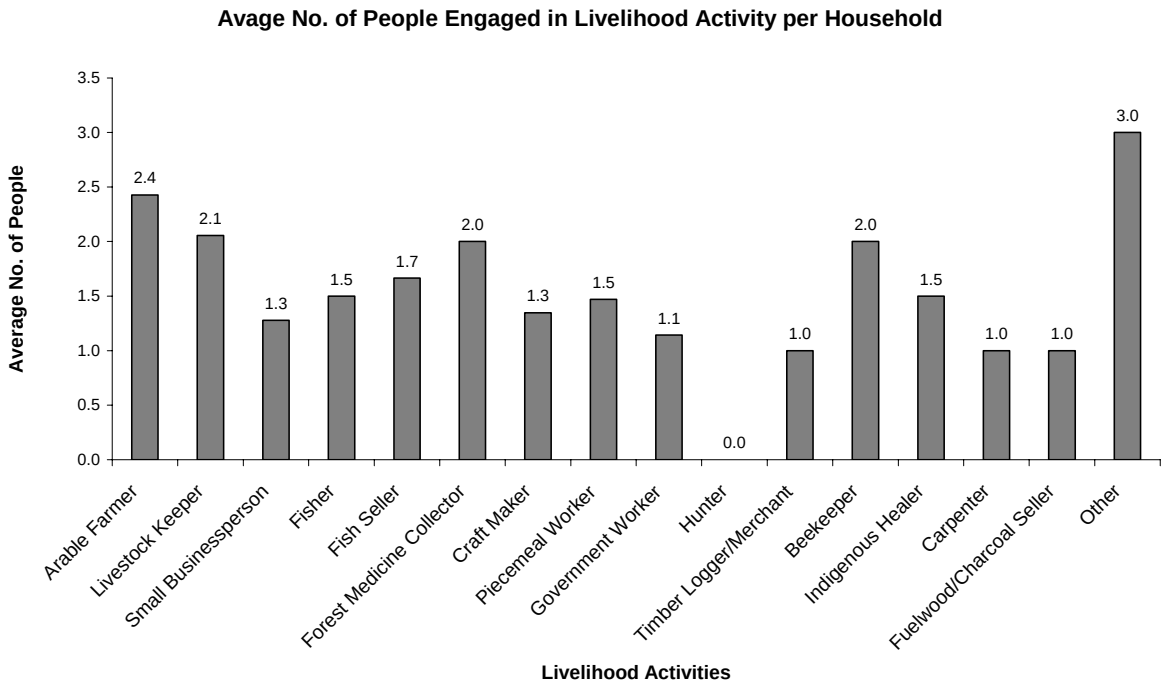


Source: WWF/Kilimanyika Research. Multiple Responses Allowed. N= 765 **KILIMANYIKA**

8.1 Involvement in Livelihood Activities

The average number of people involved in a certain activity per house hold is two people. Typically a wife and a husband and one or more children. There is no particular livelihood activity requiring a greater number of people than another, for those involved.

Table 18: Average no. of People Involved in each Livelihood Activity



Source: WWF/Kilimanyika Research. Multiple Responses Allowed

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9 Financial Assets

9.1 Savings

For villages throughout this study, respondents unanimously stated that is very difficult to save cash and that most people fail to do so. This is mostly due to the fact that the majority of respondents are subsistence farmers who do not generate significant incomes and therefore do not have any cash left over after their living expenses have been taken out. It is also due to the fact that this is not a culture of saving cash. However, there is also a problem with debt. Systems of local lending prevail over formal lines of credit. Repayments are made in kind and usually at several times the value of ther original loan.

9.2 Investments

A few people have investments that have been derived from cash, such as property or milling machines. Others noted that the land on which they farmed was an investment.

9.3 Access to Credit

Access to microcredit in rural areas is difficult. In the villages surrounding Magombera Forest this is no exception. The vast majority have no access to credit or do not know how to access it. Distance from the institutions, lack of infrastructure, lack of awareness, high interest rates, lack of groups being formed to share loans together and lack of collateral, as well as scare stories about people losing everything when they are unable to pay, make many respondents sceptical about success.

Further limitations are a lack of start-up capital to put down as deposits or bonds and difficulty in paying back loans. The latter is exacerbated by a local tendency towards low-income enterprises, poor financial planning, insufficient knowledge of bookkeeping, poor cash flow management, and the inability to ensure money borrowed is spent on the enterprise that it was lent for. Ultimately the communities spoken to have little education on these matters, and would welcome more and the loans institutions are not on the whole ready to lend out – in part because their conditions have not yet been met by these communities. In the meantime they continue to borrow from local lenders at deplorable levels of interest.

9.4 Diversification

The absence of capital investment and poor access to credit together make it difficult for people to develop any one particular livelihood to a highly profitable degree, and most people only raise enough to break even. Livelihood activities are usually restricted in their growth. This generally means that for the majority of people individual activities do not bring in sufficient wealth, but rather only a proportion of the income required. Consequently most people diversify in order to survive where there are opportunities to do so.

9.5 Access to Markets

There are a lack of markets. Markets are bad all over the year; buyers decide to buy crops at the price they wish to. They buy crops at a low price during harvest and sell at higher prices in bad months.

9.6 Stated Average Incomes per Household

The average household income is TSh 490,237/= per year. Notably, this amount includes only income generated from activities such as farming, livestock keeping, small business and the use of natural resources such as forest product i.e. timber, firewood and weaving, not income-in-kind from subsistence farming. It is also noted that the vast majority of the community members do not keep records of what they have gained and spent. This income amounts to barely over USD $1 a day.

Table 19: Stated Average Annual Income per Household

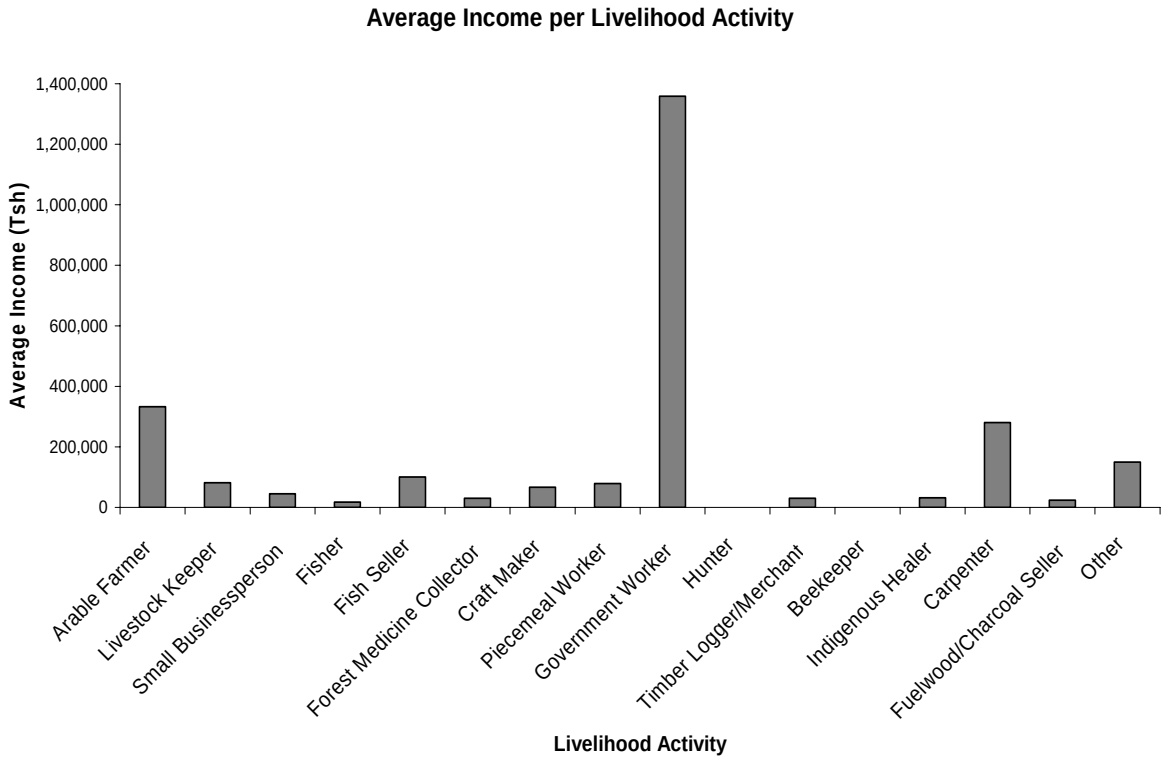
Period	Income
Average Annual Income	490,237
Average Monthly Income	40,853
Average Daily Income	1,344

Source: WWF/Kilimanyika Research KILIMANYIKA

9.7 Average Incomes per Livelihood Activity

For the tiny proportion those that can get it, employment brings the greatest incomes. The livelihood activity that brings more income to the community is of government worker which brings about TSh 1,400,000/= per year, however there is only few people involved in this activity; in all the villages the government posts are limited to only very few such as teachers and Village Executive Officers.

Table 20: Average Annual Incomes per Livelihood Activity by Household



Source: WWF/Kilimanyika Research. KILIMANYIKA

9.8 Employment

Only 3% of respondents were employed, a significantly low proportion. Further, of those that are employed, 3 in 4 were employed as Village Executive Officers, only one by TAZARA. The implications of this are manifold, but most importantly perhaps, this means the community surrounding Magombera Forest have no experience of working for any organisations and the subsequent skills and experiences such employment brings, but also that a lack of employment means a lack of earnings and therefore a lack of capital circulating in the four study villages.

9.9 Expenditure

Despite reporting an average daily income of TSh 1,344, the average daily expenditure was reported to be TSh 4,384. There are number of reasons why this may be so.

- One, that people tend to over-exaggerate their expenditures and understate their incomes when being interviewed – some hopeful that if they do, financial support will be forthcoming.
- Two, because of a limited amount of financial management knowledge, making it difficult to make a precise estimate of both income and expenditure.
- Three, because the income stated does not, for the most part, account for income-in-kind from subsistence farming – which if counted would account for a considerable greater level of income. A great proportion of the economy of this area is based on subsistence, and to an extent, on barter as a form of trade. This is not solely a cash-driven economy. Farmers will store harvests and use and exchange these over time and the majority of people live on what food they produce or catch.
- Four, because a system of bartering is in place for many goods, making it harder to differentiate income and expenditure in purely cash terms
- Five, because outgoings may genuinely be greater than income. Indeed, in discussions people often explain that they are never free of debt of some form.

77% of respondents feel that what they earn is not sufficient and that they make do. Most people only spend what they can earn or realistically pay back to their creditors on a seasonal basis. Few people earn a surplus, and any that do they do is usually channelled back into farming activities or used to pay for household expenses.

9.10 Animal Husbandry

Some income is in kind. The majority of respondents keep livestock particularly poultry (chickens and ducks)to diversity their incomes and provide food. As shown in the table below, the average livestock farmer within the sample has 10 chickens and 4 ducks/geese within his/her household and the average number of goats/sheep are 4 per house hold and an average of 5 cattle per house hold. People also keep pigs and donkeys; the average number of pigs per house hold is 2 and 6 donkeys.

Table 21: Type of Livestock Held per Household & Average Amounts

Livestock Type	Livestock Keepers	Total No Livestock	Average No per HH
Chickens	128	1,343	10
Ducks/Geese	20	77	4
Goats/Sheep	3	11	4
Cattle	2	10	5
Pigs	21	46	2
Donkeys	1	6	6

Source: WWF/Kilimanyika Research. KILIMANYIKA

10 Alternative Livelihood Programmes

10.1 Understanding AIGs

The importance of alternative livelihoods, or alternative income generating activities (AIGs) to the economic development of communities has so far taken little hold. The community respondents interviewed were asked whether any organisations had come to their village offering support for "alternative livelihoods". It is not clear whether the term was understand and whether respondents took this question to mean organisations that were offering livelihood or social services support in general. However, 37% said that alternative livelihood programmes had been initiated by organisations in their villages.

Of the organisations mentioned, whether or not they were in reality offering support to alternative livelihoods (the term, *shughuli mbadala* in Swahili, is not well understood), WWF was the most commonly mentioned. Also mentioned were TANAPA, SGR, PADEP, TASAF, PLUM and to a lesser degree the District Government in various forms including supported by the World Bank. Only Katurukila and Msolwa Station had exposure to WWF. Only Katurukila had experience of TANAPA and only Kanyenja had experience of both PADEP and TASAF. Msolwa Station and Kanyenja were the only villages that mentioned SGR in this regard.

Because people do not really know what they are, development of AIGs will therefore first need a clear explanation of what they are and how AIGs may bring greater economic growth to individuals, groups and villages. Further, implementation of any future-proposed AIGs will need to take into account current levels of education, skills, experience, access to resources, capital and credit, access to markets and understanding of small business management.

10.2 Potential of Tourism

Currently there is no experience of or engagement in tourism in the villages surrounding Magombera Forest. Only one individual in Magombera village worked on a contract basis for a hunting company in SGR. However, people are very keen on tourism and would like to see it be developed around Magombera Forest in some form, with their involvement. The main areas in which they would like to benefit from future tourism developments are from employment, improved infrastructure and economic spin-offs such as increased small business opportunities.

People stated they have a number of tourism attractions to offer. These are; the forest, Udzungwa Red Colobus monkeys, medicinal plants, elephants and other wild animals, plants, rivers and salt lakes.

Participants acknowledged that with their own lack of understanding of the dynamics of managing a tourism industry or even working within the sector, that they will require training and education on how they may get involved. This could be in the form of community based tourism where they would manage and operate accommodation and forest-based actvities, or in the form of support from a private sector operator, where the local community are employed. Community respondents expressed their willingness to be involved in an operation where they receive village dividends from tourism profits, where generated by the community or a tour operator, as has been successful in other areas (Harrison, 2001).

Poor standards of infrastructure, particularly access to Magombera Forest by road as well as lack of electricity and water supply would be a limiting factor to tourism development on a local level. From a national perspective, tourism operations in Magombera Forest would have to work closely with operators in Mikumi and Mang'ula to take advantage of tourists visiting Mikumi and Udzungwa National Parks. Any tourism developments in Magombera would have to be small scale and would benefit from a community emphasis. However, a specific study on the opportunities for community based tourism for the villages surrounding Magombera Forest in recommended.

11 Land Use Planning

11.1 Perception of Land Laws

Asked are there any land laws, the 78% of 'no' responses given shows a perception that there are no land division laws, indicating that land use planning is not well known by the majority or has not yet been carried out. Current land laws, where they are perceived to exist are informal laws set up by the community to manage their own land in the absence of formal laws. However there are land management committees in place in all four villages to allocate land.

11.2 Perceived Land Management Services

65% of respondents believe there are no land use services in their community, although many did not know what was meant by the question 'what social services have an impact on land management?' because it is a difficult area to understand when there is no history of such services. Of the 35% that said there were such services, the majority took the question to mean regulations in place to mitigate environmental degradation. This indicates that although the process of land use planning is underway, with support from WWF, that people are still largely unaware of this process.

11.3 Limited Space, Limited Resources

Respondents in Katurukila and Magombera village response to have a free land which is settled aside as the village forest reserve and responses to have no any more free land in their village. In Msolwa station and Kanyenja, respondents typically stated that within their villages there is no remaining land for community usage for community usage. There is an ongoing conflict over double-allocation of land between Msolwa Station village and Illovo, being dealt with at District and National Government level. Although it appears that Illovo were the first to have title and therefore have formal rights to the land, some people still do not understand why they do not have land rights.

> *My family and I were moved by force from our land and forced settle close to the road to form the village in 1974 during villagisation, all villagers have been using that land freely up to 2003, when ILOVO took it we were then forced to move again. Is this fair?* (An interviewed woman from Msolwa Village)

11.4 Degree to which Land Use Planning has been carried out

None of the four villages studied had formal land use plans at the time of writing, although in each village the responses suggested that WWF had begun to support the process alongside the Kilombero District Council but general lack of awareness suggested these were very early days.

11.5 Existence of Certificates, Zoning Plans, and By-Laws

In all the four villages studied, it was stated that none have a village land certificate, official by-laws or zoning plans that have been passed by the district because they have not been through the land use planning process. However, most have informal agreements about where different village activities such as grazing, farming zone, and settlement may take place. However, in Katurukila village, when asked if there is any free land remaining, they stated they have about 174 acres which has been settled aside as a village forest reserve, although the process is not yet completed.

Management planning and the development of by laws have been implemented with support of WWF, although the clear lack of knowledge of this process, despite its process being a participatory one, indicates lack of communication of each stages of the process from those involved to the village assemblies.

11.6 Approval Process for Land Allocation

Regarding the approval process if some one from outside wishes to own land in any of the study villages, there are three ways of obtaining the land but all should be approved by the village's government. The first way is for the outsider who wishes to buy a land to reach an agreement with a villager who owns the land and to buy it, and the second is for the outsider to write an application letter to the village government applying for free land and if there is any, the village will allocate it to the applicant after paying all the required village fees. The third way is for the outsider being given land by a friend or family member who is resident in the village, although the village government have to approve it.

11.7 Forest Boundaries

While asking if they know the forest boundaries, the majority of the respondents stated that they don't know where Magombera Forest borders their village; a minority from Katurukila village responded that they only know where their village bordering the Selous Game Reserve, and this is because SGR have laid out sign posts along their boundary.

12 Influential Institutions

Assessments included gaining an understanding of the institutions that have a political, social or economic influence on the communities in the study area. This exercise involved prioritisation of institutions and is useful in indicating if a particular institution or organisation has a real impact on a particular community.

The most important institutions available to people in the villages surrounding Magombera Forest are first and foremost health and education services, followed by religious institutions. Village Government is also seen as an important institution. After these, TAZARA is considered of real importance because of the support the railway provides for local economies and contract work. This is followed by Illovo, because of the support they provide in terms of buying sugar cane from village outgrowers. This is followed by the Selous Game Reserve for the support they have provided in building classrooms and wells (and in training village game scouts in Kanyenja). Both TANAPA and WWF were mentioned but only in Katurukila village, where TANAPA is appreciated for oits conservation activities and WWF for the environmental education programme they have started there.

Respondents were also asked questions relating to their understanding of the existence of village level and district institutions that relate specifically to management of the forests, water and land etc, including committees and associations as part of an assessment of their knowledge of their own institutions. The results are as follows.

12.1 Perceived Management Institutions

60.4% of people believe that there are institutions that relate specifically to management of the forests, water and land. The institutions that are perceived to oversee land, forest and water management are listed alphabetically below. Their answers however show the degree to which NGOs and private companies are amongst village and higher government level institutions as being perceived as influential when it comes to managing land, water or the forest locally.

Table 22: Perceived Management Institutions

District Council
Participatory Land Use Management (PLUM)
Plan International
Religious Institutions
Selous Game Reserve
TANAPA
Village Environmental Committee
Village Forest Reserve Committee
Village Game Scouts
Village Land Committee
Village Land Use Management (VLUM)
Village Water Committee
Village Government
WWF

Source: WWF/Kilimanyika Research. KILIMANYIKA

12.2 Environmental Management Committees

Of all the four villages, only Katurukila has an environmental management committee. They are ahead in this aspect because they were supported initially by a combination of Kilombero District and SGR in the creation of a Village Forest Reserve and later by WWF. However it was indicated that their environmental committee lacked energy in its activities and would benefit for continued capacity building in its early development.

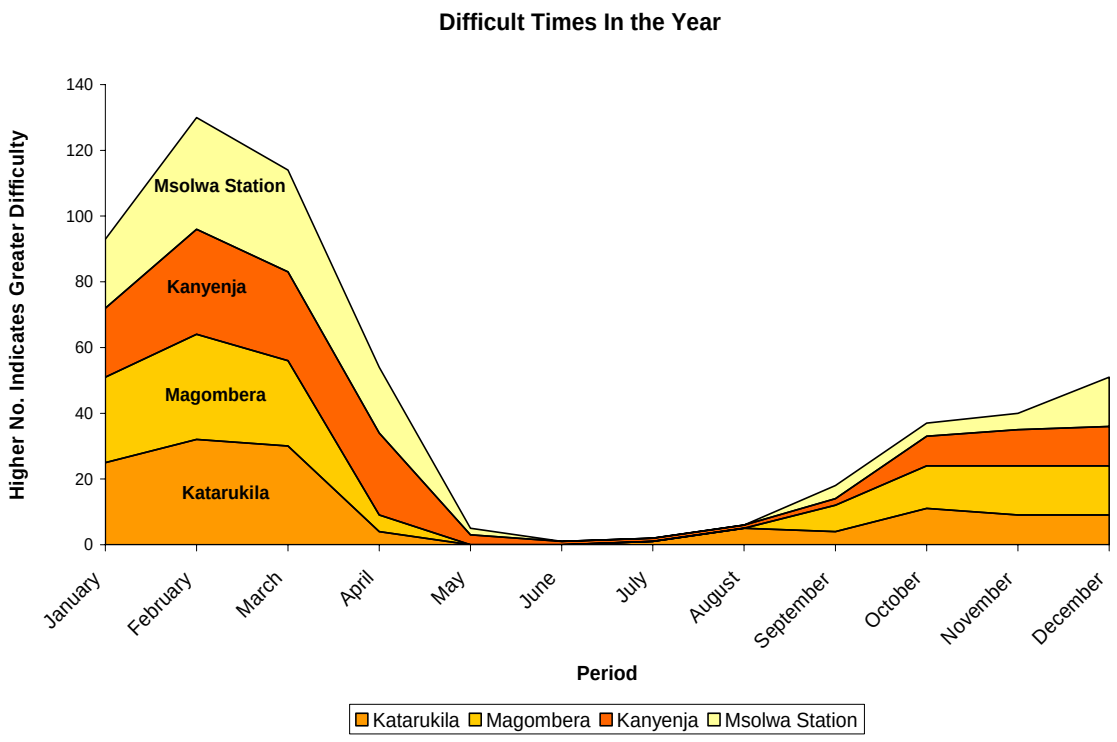
13 Seasonal Challenges

13.1 Seasonal Calendar

Information was gathered related to changing circumstances over the course of the year and how these circumstances impacted on whether respondents felt a particular month was a relatively difficult or an easy time. Understanding whether a period is difficult or not, and the reasons why, help illustrate the vulnerable periods, times when people may feel their survival is threatened and may respond by increasing the level of reliance on their natural assets or on local or external support. Times of growth and success may also represent a threat to natural resources if, for example, successful harvests lead to greater exploitation of a particular crop which results in the clearing of more forest land.

Overall, the period January to March is considered the hardest. June to August are considered the best times by most respondents because they are times of relative comfort and wealth in comparison. During hard times people rely on getting casual work if they can or borrow from each other or local lenders.

Table 23: Most Difficult Months in the Year



Source: WWF/Kilimanyika Research. High no. indicates a more difficult time

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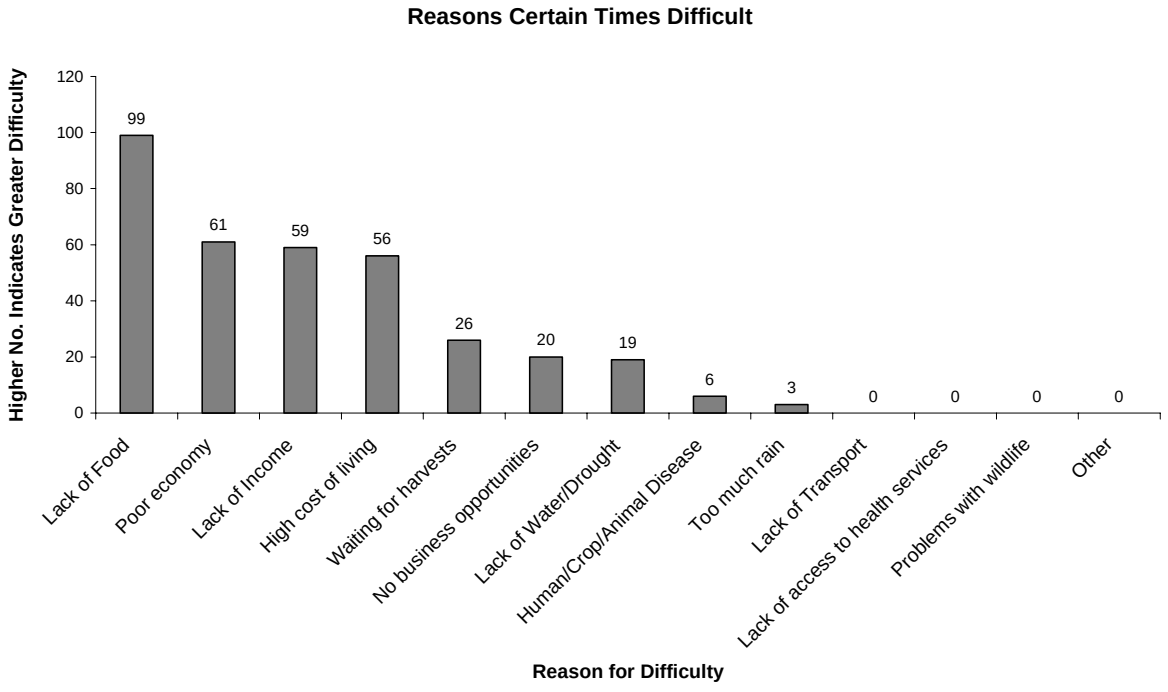
There are a range of reasons why life becomes difficult at certain times of the year. The most common reason is lack of food, although problems such as poor economy, lack of income and a high cost of living also cause difficulties.

Table 24: Reasons Why Certain Times of Year are More Difficult



Source: WWF/Kilimanyika Research. Multiple Responses Allowed

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Going into further detail gathered through the sustainable livelihoods assessment, the seasonal calendar below further defines the year for the communities under study as a whole.

Table 25: Seasonal Calendar

Month/Season	J	F	M	A	M	J	J	A	S	O	N	D
Season/rains	Masika Rains								Vuli Rains			
Income generating activities	Agriculture, Small business such as local brew, Kiosks, labours, Livestock keeping				Livestock keeping, labour, trading forest product-timber, firewood, small business,			Livestock keeping, farming, small business				
Income - bad months	Low incomes. Supplies running out, farm work increase.									Supplies low		
Income - good months				Good income is available from farming, fishing and small business								
Expenditure – high	Increased living costs									Increased living costs		
Expenditure – low				Reduced living costs								
Prices/markets – high per sector	Prices High for Agricultural Crops (Limited Supply, High Demand)				Prices High for industrial commodities e.g. Sugar, clothes etc.					Prices High for Agricultural Crops		
Seasonal opportunities				Good period for rains and farming season, small business, piecemeal, labour.								
Market -good months								The buyers come to the village to buy crops.				
Market- bad month	Market is bad all year; buyers decide to buy crops at the price the price they wish too. They buy crops at a low price during harvest and sell at higher prices in bad months.											
Hard times	Drought,		Income low, human diseases increase								Food become expensive, drought and low income	
What crops farmed at this time	cassava		Maize, Rice, ground nuts								Cassava, vegetables	

Source: Kilimanyika. KILIMANYIKA

14 Vulnerability

Challenges and threats to livelihoods are complex and numerous, especially in a situation where the communities live in basic conditions, have few capital reserves and thus rely extensively on their surrounding natural resources, some of which are seasonal and affected by climatic variability. Such communities are also vulnerable to political change, natural disasters, disease, drought and famine and often have few means to combat or cushion themselves against unforeseen events. This means at certain times dependence on natural resources, for survival, or profit, or both, is often increased and thus social and economic costs also become ecological costs. In hard times, people survive by selling or otherwise increasing their utilisation of natural resources.

Understanding the degree of which a community is vulnerable at certain times or in particular circumstances is key to understanding a community as well as being able to gauge the likelihood of shocks that may occur seasonally or temporally. Ultimately, the more vulnerable a community is, the more at risk they are from external influences or shocks and the more likely they are to be in an unsustainable position, potentially unable to maintain their asset base or their relationships.

14.1 Assessing Vulnerability

The communities under study unanimously report that they feel vulnerable to change because of a number of key limitations, namely: increasing climatic variability, very low levels of education, limited health facilities, lack of financial assets, lack of infrastructure, crop damage and failed harvests, limited access to water, lack of employment and lack of benefits from the surrounding land and natural resources. Lack of access to land titles also increases the degree to which a community is vulnerable to outsiders as well as lack of control over the allocation of land.

14.2 Shocks

Droughts and floods are uncommon but do occur. Disease outbreaks are common and malaria remains a feared disease for the majority of people. Loss of crops from wildlife presents an unpredictable risk, particularly from elephants. White fly or army worm outbreaks damage their crops.

14.3 Health Issues

Participants are concerned about their health, particularly about the risk of malaria, but also typhoid, cholera and dysentery. Lack of quality health services leaves people feeling vulnerable.

15 Human-Wildlife Interactions

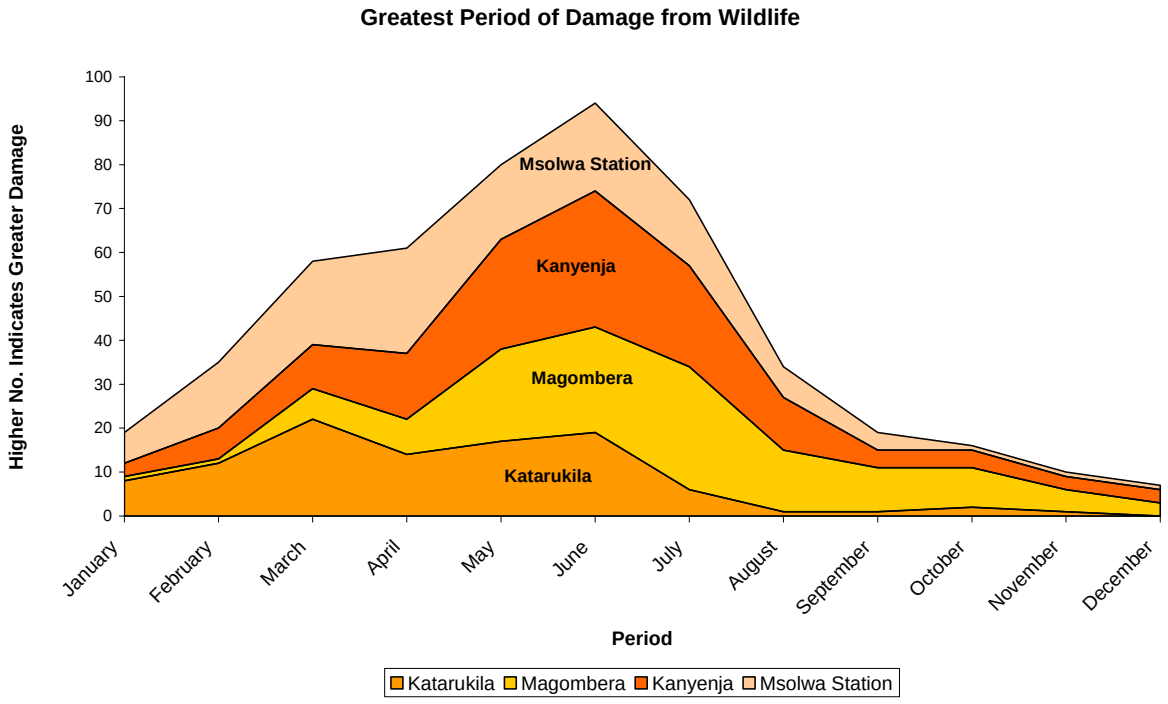
15.1 Human-Wildlife Conflict

Human-wildlife conflict is an insignificant problem compared with lack of food, lack of income and insufficient social services. However, it is worth understanding the effect on communities surrounding Magombera and the Selous Game Reserve because human wildlife conflict has considerable effects on whether people will look favourably towards a reserve or otherwise. Crop raiding is considered the greatest problem according to 98% of respondents, and human injury seen as a problem by the remaining 2%. Inevitably, some people confront this problem by hunting, because although during the course of this research respondents denied any hunting, closer inquiry revealed hunting for bushmeat was occurring.

15.2 Seasonality of Wildlife Disruption

There is a distinct seasonality to when wildlife disruption is at its highest. Disruption is at its greatest during the dry season of May-July when harvests are ripe. If a farmer loses their harvest to wildlife at this point they face considerable difficulty for the rest of the year. Any future support to communities in limiting crop damage by wildlife should take into account a need for particular vigilance during this time.

Table 26: Disruptive Periods Caused by Wildlife Throughout the Year



Source: WWF/Kilimanyika Research.

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16 Use of Natural Resources

16.1 Natural Assets

People perceive their surrounding natural environment, including the lake, forests and forest products, as being a source of natural capital, available both in villages and/or in the surrounding areas. As the table on *Assets* shows, there are a range of natural assets available to the communities of this study including land, forests, water, minerals and wildlife.

16.2 Using Natural Assets

Natural assets provide communities with the resources they require for their livelihoods, for example:

Trees & Deadwood	Fuelwood for cooking, blacksmithing, brewing alcohol, brick making (where not fired with rice husks); poles for building; charcoal for cooking and blacksmithing; timber extraction (limited) for sale; trees for locating hives for beekeeping (limited), wood for building hives, timber for carpentry/furniture making; wood for making agricultural implements and weapons;
Forest Products	Medicines for healing; mushrooms for eating; grasses for feed and thatch
Water	Rivers for water supply; fish for food and business, stones and sand
Climate	Communities indicate the importance of forests in providing a climate conducive to good farming opportunities, particularly rainfall.

16.3 Dependence on Natural Assets

Because of the considerable amount of support natural assets give to the communities living adjacent to Magombera Forest, communities throughout the region are highly dependent upon them. Natural assets, or resources, provide the basis for energy requirements, for health, for habitation and for income generation. Use of natural resources is ever-increasing as peoples demand for such a support rises alongside growing populations and growing aspirations. As natural resources diminish locally, which all villages adjacent to Magombera Forest say they are doing, people will travel further afield, including into the forest reserve to gather them. Because of limited local availability, more and more people buy their forest products rather than gathering them themselves, often without knowing where the vendor has gathered them from.

Technological developments in efficient farming practices and the use of renewable energy are steadily increasing on a local level although not yet at a sufficient enough rate to counter the increased utilisation of natural assets. Education levels are low which means communities continue with practices they are familiar with without being aware of more sustainable alternatives. In short, in the context of Magombera communities, resource use remains high and dependence on natural assets extensive.

16.4 Source of Fuelwood

As shown in the table below, according to 48% of responses it is common to use peoples own farm areas as the primary source of fuelwood, while 18% use the community forest and 17% of responses show vendor-supplied firewood is also common. 14% extract their firewood from their own home trees.

Table 27: Source of Fuelwood per Household

Source of Fuelwood	Sample	Percentage
Farm	85	48.0%
Community Forest	31	17.5%
Bought	30	16.9%
Own Trees	25	14.1%
Magombera Forest Reserve	6	3.4%
	177	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

Only 3% responses show they extract their firewood from Magombera Forest However in groups some stated that people do obtain natural resources such as fuelwood illegally from there, thus this figure is likely to be marginally higher in reality, especially for villages close to the forest.

16.5 Level of Dependence on Fuelwood

As part of understanding the level of dependency on firewood, each respondent was asked to describe the level to which their household depended on firewood to meet their energy needs. A staggering 91% say they are *very* reliant on fuelwood, indicating both a high usage and a lack of alternatives.

Table 28: Perceived Level of Dependence on Fuelwood

Level of Dependence on Firewood	Sample	Percentage
A Little	4	2.6%
A Medium Amount	9	5.9%
A Great Deal	139	91.4%
	152	**100.0%**

Source: WWF/Kilimanyika Research. KILIMANYIKA

16.6 Source of Charcoal.

Buying, rather than making charcoal is most common according to 68% of responses, which state that they buy charcoal from vendors. Many of these vendors are villages residents and others come from the nearby villages. According to 32% of responses, many obtain charcoal from their own farms, own trees and community forests. .

Table 29: Source of Charcoal per Household

Source of Charcoal	Sample	percentage
Bought	07	7.7%
Farm	29	18.4%
Own Trees	15	9.5%
Community Forest	6	3.8%
Magombera Forest Reserve	1	0.6%
	158	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

It was stated that charcoal vendors do use the Magombera Forest on different occasion as their main source of charcoal, although they do this illegally. It is not possible for those who buy charcoal to know where it has been sourced from. A system of labelling or branding charcoal would be helpful in this regard because whilst people can say they don't make charcoal anymore, if they are buying it and it has come from an unsustainable source, the effect is the same.

16.7 Source of Building Poles

61% of responses suggest that most people buy their building poles from vendors. Most of these vendors are from their own village or neighbouring villages. According to 35% of responses, many people are getting their poles from their farm areas, own trees and village forests. Only 4% of responses indicated that people use Magombera Forest to extract buildings poles. As this is an illegal activity, the actual figure is likely to be higher.

Table 30: Source of Building Poles per Household

Source of Building Poles	Sample	Percentage
Bought	96	60.8%
Farm	28	17.7%
Own Trees	16	10.1%
Community Forest	11	7.0%
Magombera Forest Reserve	7	4.4%
	158	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

As with charcoal, it is not possible for those who buy building poles to know where they have been sourced. A system of labelling or branding poles to show their origin would be helpful, although complicated to manage in reality.

16.8 Source of Natural Medicines

The majority of the respondents state they obtain their traditional medicines from community forests, farm areas, own trees and the Magombera Forest. However, 35% of responses given indicate people buy their natural medicines, usually from specialised healers.

Table 31: Source of Natural Medicines per Household

Source of Natural Medicines	Sample	Percentage
Bought	55	34.8%
Farm	49	31.0%
Community Forest	25	15.8%
Own Trees	18	11.4%
Magombera Forest Reserve	11	7.0%
	158	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

The majority of the community members buy their natural medicines rather than obtain it freely from their areas because of scarcity in their vicinity land area, those who collect natural medicines have to travel a long distance get the right tree for medicinal use. This is a key reason why traditional medicines prices are rising.

16.9 Source of Grazing Pasture

As indicated below, a significant 22% of people interviewed in both sampled village responded that, they do bring grass from other areas and graze in open areas, however 75% of responses suggest most obtain their pasture from their own farms.

Table 32: Source of Grazing Pasture per Household

Source of Grazing	Sample	Percentage
Magombera Forest Reserve	3	2.6%
Farm	88	75.2%
Cut Grass	8	6.8%
Open Area	18	15.4%
	117	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

16.10 Beekeeping Activities

Although there are many who view beekeeping as a key potential alternative income generating activity for the communities adjacent to Magombera Forest, according to 72% of responses most people do not keep bees and thus development of beekeeping is still some way off.

Communities stated that beekeeping has little importance in their livelihoods especially in income generation, although honey is used in the all the studied villages for different purposes, for example local brew making and for medicinal purposes. The majority of people tend to buy honey rather than keep bees. However, according to 28% of responses, a sizeable minority do practise bee keeping and those that do state they carry out this activity on the community forest, farm areas and in the Magombera Forest.

Table 33: Source of Beekeeping Activities per Household

Source of Beekeeping Activities	Sample	Percentage
Do not keep bees	106	72.1%
Community Forest	31	21.1%
Farm	9	6.1%
Magombera Forest Reserve	1	0.7%
	147	**100.0%**

Source: WWF/Kilimanyika Research. Multiple Responses Allowed KILIMANYIKA

16.11 Value of Forest Products

Although the four villages surveyed are adjacent to Magombera Forest or Selous Game Reserve, the cost of natural resources products particularly charcoal, traditional medicines, honey and firewood are relatively high. The average cost for one bunch of firewood is TZS 1,226/= while for building pole it is TSh1,010/= for one big pole. Charcoal is priced at TSh 7,080/= per sack. A litre of local honey costs TSh 2,712/=

These are higher prices than recorded in similar studies in the Kilombero/Kilosa area by Harrison (2006a,b). The higher prices indicate both an increasing annual cost of living in general and that resource scarcity is forcing prices up.

Traditional medicines are expensive, the average cost is almost TSh 4,000/= per dose. This is because few in the village knows exactly which tree (leaves, roots etc) will cure or treat Typhoid for example, and there are only few member of the community who are specialists in this (knows as *waganga wa kienyeji*). In order for some one to get a health service from their traditional doctor, there is an advance payment known as *kiendea porini* – a collection fee - and then a final payment for being cured or treated. The responses also suggested that although some do have knowledge and know some of the medicinal trees but they admitted that not everyone has sufficient skills or experience to cure people.

Table 34: Average Values of Forest Products

Product	Average Unit Cost (TSh)
Bunch of Firewood	1,226
Dose of Natural Medicines	3,973
Single Building Pole	1,010
Sack of Charcoal	7,080
Litre of Local Honey	2,712

Source: WWF/Kilimanyika Research. KILIMANYIKA

Environmental Awareness

1 Level of Environmental Awareness

1.1 Perceived Level of Environmental Awareness

In Magombera and Msolwa station villages there is a reported lack of environmental awareness, and people wish to be given environmental education. However, in Katurukila and Kanyenja villages, people stated that they have received environmental education, and when asked who gave the education, they mentioned WWF and TANAPA as the environmental education provider. However all respondents wish to have more education, particularly on trees nurseries, use of alternative energy savings stoves and tree planting techniques, and support with equipment.

1.2 Awareness of Environmental Degradation

The majority of participants believe that natural resources are decreasing. This is mostly caused by cutting of the trees down for firewood, timber and charcoal, climate change was also on the list in causing natural resources decreasing and environmental destruction.

Community representatives, particularly from Magombera village, stated that the current status of the forest is in bad form, that there is an increase of illegal off-take of the natural resources such as firewood, charcoal making, illegal hunting and building poles extraction which has led to decreasing forest size.

1.3 Knowledge of Mitigation Measures

The community are aware of measures that can be taken to mitigate environmental and land degradation in their villages. The majority of respondents stated: tree planting, control of wildfire, proper management of natural resources, establishment of village forests and for the community to grow their own trees in their village land/farms which may be a way forward in mitigating negative environmental impacts.

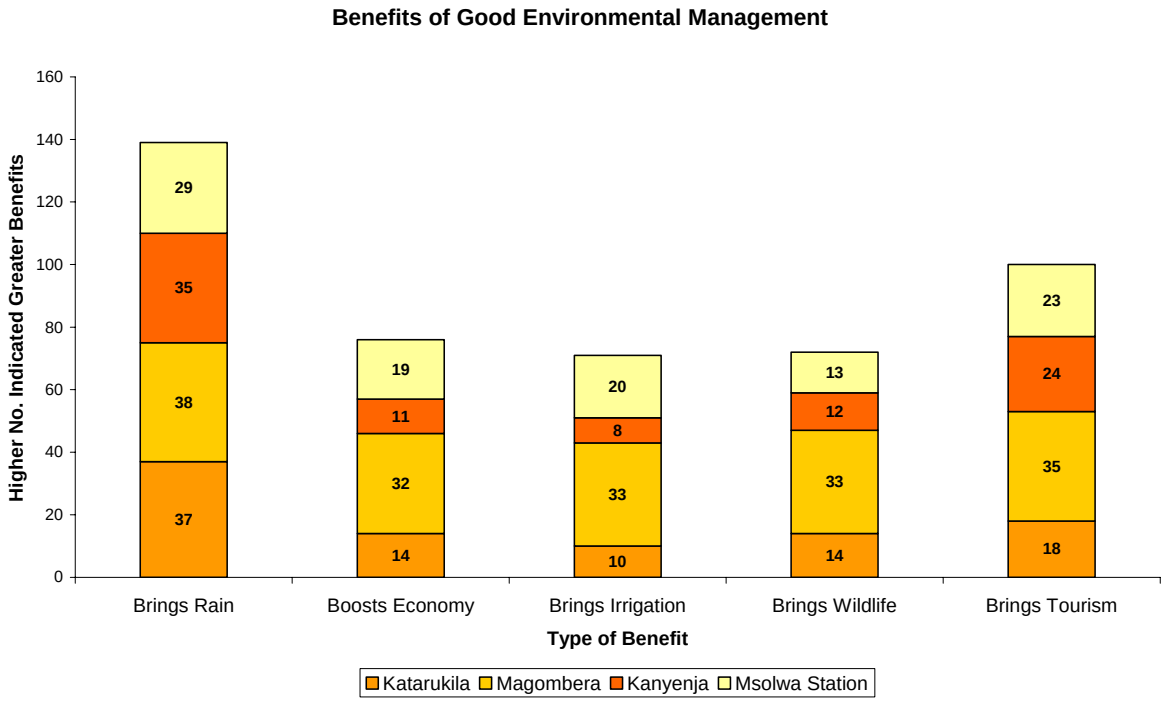
1.4 Knowledge of Environmental Initiatives

During discussions groups in every village, participants stated that they are aware of and have knowledge of environmental initiatives. However, there is different level of understanding in each village: participants from Katurukila village stated that the major initiatives carried on in their area have been tree nurseries preparation and the roll out of energy efficient stoves for the minority; in Magombera there is little knowledge, however, participants stated that WWF is initiating the process of participatory land use planning in their area and this is the same situation in Msolwa Station village. In Kanyenja village TASAF and PADEP organisations have been working together with villagers to initiate best practice in agriculture (instigation of sustainable agriculture).

1.5 Benefits of Good Forest Management

During the assessment of environmental awareness, respondents listed key reasons why good environmental management were important to them. Rainfall is seen as the most important reason for safeguarding the natural environment, followed by the potential of tourism – despite having not yet experienced the benefits of tourism.

Table 35: Benefits of Good Forest Management



Source: WWF/Kilimanyika Research. Multiple Responses Allowed

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2 Knowledge of Regulations

2.1 Knowledge of Forest Management Regulations

The majority of people from Katurukila and Kanyenja villages are aware of the rules and regulation relating to what they can and can't do in Magombera Forest. They mention tree felling, hunting and collection of poles/freshly cut firewood as the some of the activities which they can't do in the forest. Beekeeping, collection of grass and dead wood are also some of the activities of which they can do in the forest but they can do these activities only with permit. They also state that despite knowing the laws and forest regulations they are still accessing the forest illegally due to the scarcity of natural resources in their village land .

However, in Magombera and Msolwa station village the majority of the responses stated that they do not know anything about forest rules or regulations. The reason given is that "not a single villager is allowed to enter in the forest so how can we know the rules or regulations?".

3 Use of Alternative Sources of Energy

3.1 Experience of Using Energy-Saving Stoves

There was little knowledge of the use of energy savings stove in all villages, however a minority from Katurukila stated that they use energy savings stoves for cooking food. The majority also responded that, they wish to get education on the use of energy saving stove in their villages.

3.2 Experience of Using Rice Husks for Firing Bricks

There is very little known about the use of rice husks for as an alternative use for firing bricks. In the questionnaires, 54% of responses indicate a majority of houses are made of firewood burnt bricks although only 1% of the responses suggested houses are made of rice husk burnt bricks. This illustrates that only few people know and are ready to use the alternative energy means in brick burning.

A minority of the community members have tried to use rice husks but they stopped and the reasons given were: *Quality*; those who use rice husks responded that rice husks produce low quality brick; *Health*, during livelihood discussions, those who have used rice husk for bricks burning stated that rice husks smoke cause breathing and chest problems, and therefore they prefer to use firewood for bricks burning. For rice husks to be used as an alternative for bricks firing, there is a need of education and awareness raising on the better use of rice husks in order to produce quality bricks and ensure peoples health.

Many also admitted that they have little knowledge on how to use rice husks which is regarded as a new technology. In Katurukila and Magombera villages, the awareness of rice husk burnt bricks is slowly increasing, however for the rice husk to be an alternative source of energy education on how this can be used and produce a quality bricks is a priority.

4 Future Capacity Requirements

Environmental awareness levels are low throughout the villages. Katurukila is in a relatively advanced state of awareness although most of the knowledge lies with the village government and a selected few who were picked to receive environmental education. Therefore there is a considerable need for a widespread environmental awareness programme.

Any such programme should pay attention to the following current capacity requirements:

- Developing overall education levels. Communities require education in the following areas:
    - How to establish tree nurseries and how to maintain tree nurseries
    - How to plant and take care of saplings in the local area and understanding of when to plant and when to prune
    - Understanding of appropriate lands for planting woodlots
    - Understanding of which trees grow fast and suit fuelwood needs
    - Instigate training in sustainable agriculture practices including terracing, erosion-control, maintaining nutrient levels, irrigation, agroforestry, appropriate intercropping and generally better land use practice.
    - Do so in order to ensure a reduced level of shifting cultivation and the use of fire for land clearance
- Increasing equipment and tools available to manage tree nurseries and tree planting programmes
    - Availability of potting materials, fertilisers, pesticides, wheelbarrows, watering cans, gum boots, gloves, shovels and trowels
    - Ability to maintain and safeguard the equipment provided so that it does not wear out or become lost or stolen
- Instigating an element of market economics within the tree planting programme to foster a sense of ownership and sustainability
    - Seedlings should be sold for a subsidised fee following an extensive education programme into the financial advantages of growing trees
    - Attendance at training workshops should require a nominal payment of Tsh 500/= as this will guarantee that those who attend tree planting education programmes have a personal desire to see it develop. Money made would be reinvested into equipment
    - Woodlots should be run on an economic basis where forest products such as fuelwood are sold by established CBOs/small business. The key to success of this would be to make sure woodlot prices are lower than standard market prices
- Establishment of Village Forest Areas (VFR) for each village using the steps highlighted in the Participatory Forest Management (PFM) process
    - Selection and training of a Village Environmental Committee and establishment of an appropriate forested area for conservation which has been agreed by the village assembly
    - Development of management plans and resource assessments and agreement on the usage levels and the type of access to the VLFR
    - Solidify agreements and plans through establishment of bylaws
- Investment into development of renewable energy supply
    - Finance (further) training on the use of rice husks in making bricks and develop means of avoiding health risks and increasing the level of quality
    - Support the financing and development of solar power amongst local entrepreneurs in order to develop an affordable solar alternative
    - Continue education about and introduction of fuel-efficient stoves

Management of Magombera Forest

1 Current managers of Magombera Forest

During the both livelihood assessments and individual questionnaires, the majority of participants from all villages stated that they do not really know which institution manages Magombera Forest, However most people stated their belief that the forest is under the Selous Game Reserve. The reason given is because they have been observing the SGR staff undertaking anti-poaching patrols in the forest.

1.1 Patrolling and *de facto* Management by Selous Game Reserve

A discussion was held with Asterius Ndunguru-Sector warden of Msolwa station and Magret Naiposha Game Warden, Selous Game reserve. During the discussion , they both suggested that, the Magombera forest is very important for the survival of the entire ecosystem, this is because the forest harbours the endemic Udzungwa red Colobus monkeys and serves as the breeding site for elephants coming from SGR, taking advantage of the forest as a recluse. According to Naiposha, SGR management through its staff in Msolwa station have been conducting anti-poaching patrols in Magombera forest three days a week. These patrols aimed to stop illegal activities taking place in the forest area and protect the wild animals from destructing villagers crops.

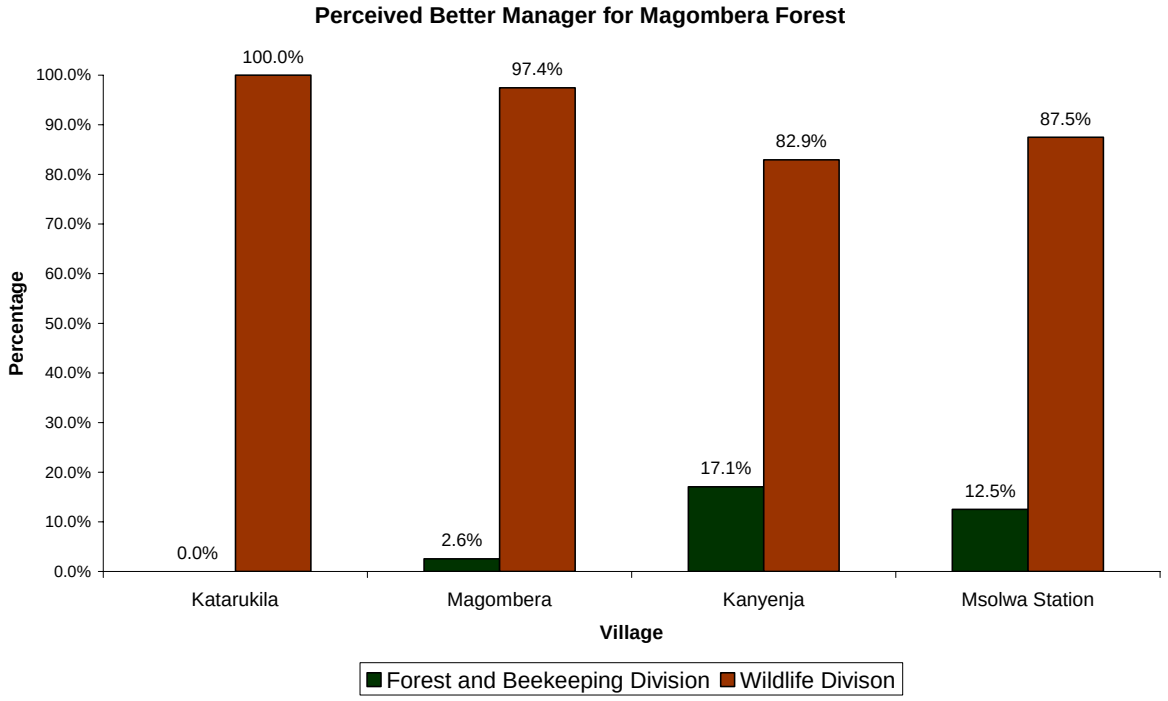
1.2 Support to Communities from Selous Game Reserve

They have also been supporting community social services e.g. Schools and water supply project which have cost about TSh 46 million, the water will be for both, villagers and the SGR-for Msolwa station staffs. Apart from that, hunting companies within the SGR supports the communities in developing some social services which is another additional benefit to the communities adjacent to SGR. The Ministry of Natural Resources and Tourism has a policy of supporting villages near by hunting blocks by providing 25% of the total income generated from hunting activities and this money used to support local communities social services in the village and this has also being done in villages around SGR. Although this money goes through the district council and therefore it is difficult to quantify these money impact in the villages.

2 *Future Managers of Magombera Forest*

The majority of the community from all the villages wishes the Magombera forest to be under the SGR for the greater benefit of both communities and conservation of natural resources. Community concern about the forest being managed by another authority is based on fear they will not be allowed to use the forest any way, while the SGR authority there will be always the possibilities for the villagers to benefit from the forest. In addition SGR have an office (Msolwa Section Headquarters) in the area and thus it is easier for them to cooperate together in the future.

Table 36: Best Department to Manage Magombera Forest?



Source: WWF/Kilimanyika Research. Higher % Indicates Greater Support KILIMANYIKA

Overall, 92% of respondents wrote that they believe the Wildlife Division to be the better future managers of Magombera Forest Reserve when asked to choose between the two (Wildlife Division and Forest and Beekeeping Division). Also, during the livelihood assessment the majority of the community responded that, although they have no idea who is the current manager of the Magombera forest but they themselves prefer the forest to be under the SGR management. Discussion groups were asked the reason why they prefer WD and not FBD or any one else and the reasons given were:

- *'Selous Game Reserve have been our neighbour for a long time now and we know then and they know us better than any other organisations…better the devil you know than the one you don't'.*
- There are opportunities to improve the relationship between SGR and the villages adjacent the forest.
- Community members suggested that if the Magombera forest will be formally under the SGR management, there will be possibilities of resource sharing in a sustainable way; which would include the collection of deadwood, thatch, grasses and they will be protected from wild animals when crop raiding.

Recommendations

1 Improving Livelihoods

The following summary steps are recommended for developing increasingly sustainable livelihoods for the villages surrounding Magombera Forest Reserve.

- Complete a land use planning process for each village which is agreed upon and clearly understood by the villages' leadership and disseminated amongst the village assemblies and appropriate committees. Completion of the process currently being supported by WWF may be sufficient in achieving these ends.
- Investigate and improve the living standard of the communities, by improving current income generating activities as well as in offering alternatives. This may be done through attracting funds for a specific alternative livelihoods study and may be carried out either by WWF or by approaching a partner with specific working knowledge of both the area and livelihoods development. Plan International may be one such partner and may be approached .
- Increase access to loans and provide the education on how to manage them. Communities have a lack of access to credit and limited knowledge of how to manage businesses involving complex financial management. They may be supported through the implementation of a community based microfinance initiative. Funding for such activities should be sought and partners found with the experience to manage these. Microfinance Institutions already operating in the area such as SACCOS or FINCA may be approached as potential partners or an an advisory level. The development of Village Conservation Banks (VICOBA) may be an output of such activities. Reference to the lessons learnt from the development of VICOBA groups in WWF's coastal Rufiji-Mafia-Kilwa and Ruaha Water Programmes would be essential in this regard.
- Increase accessibility to education facilities such as primary and secondary schools for the long term social and ecological development of the area. Education is key to understanding the importance of developing a sound understanding of what comprises *sustainable* livelihoods especially in understanding the importance of connectivity between the Selous Game Reserve and Magombera Forest and the benefits ecological integrity will bring in the long term. Primary responsibility for increasing access to education lies with the government but there may be opportunities for WWF or specialist NGO partners to continue to improve education levels in the area.

2 Increasing Environmental Awareness

The following summary steps are recommended for developing environmental education for the villages surrounding Magombera Forest.

- Developing overall education levels, especially in tree planting and how to manage resources sustainably
- Increasing equipment and tools available to manage tree nurseries and tree planting programmes
- Instigating an element of market economics within the tree planting programme to foster a sense of ownership and sustainability. If the development of tree nurseries can be made into a profitable enterprise there will be an incentive to set land aside that would otherwise be dedicated to sugar cane by outgrowers or to shifting cultivation in general.
- Establishment of Village Forest Areas (VFR) for each village using the steps highlighted in the Participatory Forest Management (PFM) process. As with tree nurseries, villages may be interested in allocating some of their land, as Magombera village already has, to development of VFRs, providing that doing so will be seen as offering sufficient long term economic and ecological gains to not use that land for farming or outgrowing purposes.
- Investment into development of renewable energy supply and continued education about and introduction of fuel-efficient stoves. This is likely best continued by WWF through its current programme of activities.

3 Future Management of Magombera Forest

Future Management of Magombera Forest will require the following:

- Selous Game Reserve should formally be given management of the forest since it has considerable ecological importance to SGR (including being a breeding site for elephant) and they have the greatest capacity amongst all the stakeholders to manage it, in fact in a *de facto* sense they are already managing the forest.
- Establishment of a good-neighbourhood programme to link the communities and the SGR authorities is essential. This should include a forest boundary demarcation project to make it clear to all stakeholders where the boundaries are.
- Magombera Forest managers should allow restricted access to the forest for the local communities for activities such as collection of dead wood and grass provided such activities are in agreement and in line with Wildlife Division policies. Authorities should restrict any activities in the forest areas which are highly degraded to allow them to regenerate.

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Appendix 1. Methodology

In carrying out field research that is objective, thorough and representative, it is important to keep in mind a range of factors that will influence results and limit the accuracy of the data gathered. Care was therefore taken to ensure that the viewpoints gathered where representative of different groups within the study area, particularly given the likelihood that certain groups and individuals may be less influential than others, such as women and younger men with potentially diverse and conflicting resource priorities, values and beliefs.

1 Criteria

It was agreed that livelihood assessments should be carried out in four villages to satisfy a balance of the following criteria.

- Communities living in villages situated adjacent to Magombera Forest on all sides
- Communities reliant on natural resources of the ecosystem of which Magombera Forest is a core part
- Settlements and respondents that are a fair geographical and demographical representation of the focus area and its inhabitants as a whole

Governments of the four villages were asked in advance to prepare one group of community members for RRA discussions over one day of livelihood assessments per village, as well as a number of prioritisation activities, incorporating an equal balance of women and men.

It would have been preferable to have taken two or three days per group to carry out the livelihood assessments, and to have split the groups into younger and older participants per gender, however this was not possible due to time constraints and the methodology was adapted to take these factors into account, by focusing all activities within a day.

2 Livelihoods Assessment & Socio-Economic Household Study

The methodology was based, with significant changes and adaptations by the writer, on Ireland (2004) and Malleret (2004), and built on earlier sustainable livelihoods studies in Tanzania by Kilimanyika (Harrison, 2005, 2006, 2007). The following factors in particular were taken into account.

- Temporal and spatial constraints (one day available per village)
- The need to gather specific information and perspectives relating to community livelihoods and the management of their environment.
- The need to allocate a substantial proportion of the time available to travel between settlements, and to data collation, analysis and reporting

However, the key approach within livelihoods assessment methodology, the use of Rapid Rural Appraisal techniques was retained (see discussion below). All meetings were carried out in Swahili.

Sustainable Livelihood Assessment is a method of gathering qualitative data and was chosen because it uses participatory and targeted research methods to gather objective viewpoints of different groups within a certain society. In livelihood assessments, which in this case were divided by gender group, attention is first paid to gathering perceptions of the livelihood assets (forms of capital/resources) available to the communities, and these are divided into five types:

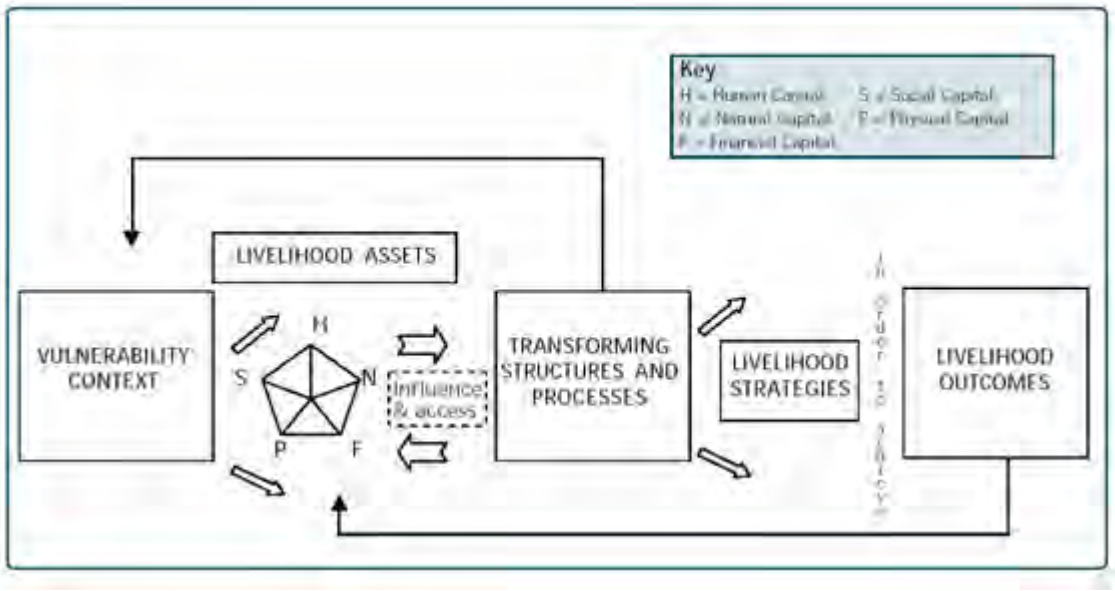
Table 37:	Livelihood Assets
Natural	Land, forest, rivers, lake life, terrestrial life, marine life, biodiversity.
Financial	Savings in the form of cash and liquid assets such as grain, livestock etc.
Human	Knowledge, skills such as beehive making, good health, education, ability to work etc.
Physical	Roads and transport infrastructure, buildings, communications etc.
Social	Networks between individuals, relationships, members of groups etc

Source: Kilimanyika, after Scoones, I,. in Carney, D,. (ed) (1998) **KILIMANYIKA**

An understanding of these assets brings awareness of the opportunities and limitations facing a community or individuals in developing their livelihoods as well as the direct and indirect values gathered from these resources. People are either enabled or restricted by these assets, for example, the skills and experiences they have, the equipment available to them, the existence or otherwise of savings or the availability of natural resources for utilisation within income generating activities.

Based on this understanding, it is possible to discuss and analyse externalities and areas of vulnerability which affect livelihoods, such as climatic seasonality, institutional/political structures and processes, access to land and other resources and attitudes towards resources. After accessing this information, through a livelihood assessment, the next step is to devise sustainable livelihood strategies which are realistic and appropriate to the conditions and issues raised during assessment. The following diagram gives an overview of this framework.

Figure 5: Sustainable Livelihoods Framework



Source: Carney, D., (ed) (1998) **KILIMANYIKA**

3 Rapid Rural Appraisal

It was with the understanding that different groups would have a variety of perspectives on the research topics, that following the work of Chambers (1983,1992), Rapid Rural Appraisal (RRA) techniques were chosen to support the sustainable livelihoods assessment as the most appropriate, practical and equitable form of gathering representative qualitative data of the kind intended for this research given the context and time scale available.

RRA was chosen as opposed to PRA because of the limited time available. RRA is a more extractive process where the agenda lies more with the interviewer than PRA, but allows for a more targeted, shorter appraisal. PRA is preferable where the researcher can spend longer periods in the study area than was possible for this research.

4 Household Surveys

In order to verify, quantify and add household data to the livelihoods assessment, quantitative household surveys were given to individual household members. These differed from the livelihoods assessment in that whereas the assessment was able to give an overview of the issues facing a village, the questionnaires allowed an individual assessment. Data was compared and contrasted between the two assessment types.

Informal semi-structured interviews (SSIs) were occasionally carried out to support the research. These were aimed at giving more specific and individual experiences of the issues surrounding the research. The interviews were to ascertain personal opinions and specific experience, usually on a deeper level than in discussions, and to reduce the likelihood of responses being coloured by other people's views. SSIs tend to be focussed on experienced individuals or representatives interested in expressing personal views.

5 Stakeholder Consultations

Stakeholders consulted were met face to face for SSIs. Interviews were either in Kiswahili or English. Due to time constraints some stakeholders or specialists who may have has an important input were unavailable to give input or there was insufficient opportunity to approach them. Meetings were held with the District Natural Resources Officer and District Forest Officer of Kilombero District as well as with representatives from the Selous Game Reserve.

6 Limitations

During the course of this study, a significant amount of data, both quantitative and qualitative, was gathered in each of the villages. It has not been within the scope of this study to use all of the data available to make as many detailed analyses of individual villages with the broader study area as would be sufficient to have a very focused understanding of each area.

Appendix 2 Quantitative Questionnaire (Swahili)

NAMBA YA DODOSO …….

TAREHE: ___ / ____ / 2007.

JINA LA MSAILI: PH | JL | | |

DODOSO -MAGOMBERA

TAFADHALI ANDIKA KWA MAKINI MAJIBU NA ZUNGUSHA DUARA KATIKA SEHEMU SAHIHI

***N** = NDIYO* ***H** = HAPANA* ***KE** = MWANAMKE* ***ME** = MWANUME*

WILAYA ..... KIJIJI:……..... ...KITONGOJI:……..

MAELEZO KWA JUMLA

JINA LA MTAHINIWA (KIFUPISHO)……

JINSIA YA MTAHINIWA? KE ME

JINSIA YA MKUU WA KAYA? KE ME

MKUU WA KAYA ANA UMRI GANI? 16-25 26-35 36-45 46-55 56-65 65+

MKUU WA KAYA NI MWANAMKE? **N / H**
KAMA NDIY0, ELEZA KAMA:
(A) HAJAOLEWA **N / H**
(B) AMEOLEWA **N / H**
(C) NI MTALAKA **N / H**
(D). NI MJANE **N / H**

KABILA LAKO.....

KIWANGO CHA ELIMU YAKO (Zungushia duara jibu sahihi)
Hakusoma Darasa la saba Sekondari Chuo Nyinginezo.

WATU WANGAPI WANAISHI KWENYE KAYA YENU? *WATU WAZIMA.....WATOTO?*.....

UNAPOTOKA
NI MZALIWA WA HAPA? N / H
KAMA HAPANA, AMETOKEA WAPI? .....
ALIKUJA MWAKA GANI? .....

KIPI KILIMVUTIA KUJA HAPA? (zungushia jibu au majibu sahihi)
Kilimo Bora Ajira Biashara Kuoa/Kuolewa Ujamaa Kujenga TAZARA Jamii Nyingine

AINA YA KAZI
UNAYO KAZI YA AJIRA? **N/ H**
KAMA NDIYO, JE UNAFANYA KAZI GANI?.....

HALI YA MAISHA

KUTA ZA NYUMBA **PAA LA NYUMBA**

UKUTA	**WEKA ALAMA**	**IDADI YA NYUMBA**	**PAA**	**WEKA ALAMA**	**IDADI YA NYUMBA YA….**
UKUTA WA MITI			HAKUNA PAA		
UKUTA WA UDONGO			NYASI		
UKUTA WA MATOFALI YA KUCHOMA (UDONGO)			MAKUTI		
UKUTA WA MATOFALI YA KUCHOMA (MPUNGA)			UDONGO		
UKUTA WA MATOFALI YA BLOK			MABATI		

RASILIMALI MTAJI:

MNAYO MIFUGO? ***MNA USAFIRI BINAFSI?*** ***MNAPATA WAPI MAJI?***

AINA YA MIFUGO	**IDADI**	**USAFIRI**	**IDADI**	**MAJI**	**ALAMA**
HAKUNA		HAKUNA		MTONI /KISIMANI / KUTOKA BOMBA LA BURE LA UMMA	
KUKU		BAISKELI		MNAPATA MAJI KUTOKA MSITU WA MAGOMBERA	
BATA/KANGA		MKOKOTENI			
MBUZI/KONDOO		PIKI PIKI			
NGOMBE		GARI		MNA KISIMA BINAFSI	
NGURUWE		TREKTA		MNA BOMBA NJE YA NYUMBA YENU BINAFSI	
PUNDA		GARI YA BIASHARA			
				MNA BOMBA NDANI YA NYUMBA YENU BINAFSI	
				MNA TANGI LENU BINAFSI LA KUHIFADHI MAJI NYUMBANI	

MAJI

MWEZI WA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
WEKA ALAMA KIPINDI AMBACHO MAJI HAYAPATIKANI												

MNAPATA WAPI MALISHO? ***MNAPATA WAPI KUNI?*** ***..MNAPATA WAPI DAWA YA KIENYEJI***

ENEO	**ALAMA**	**ENEO**	**ALAMA**	**ENEO**	**ALAMA**
MSITU WA MAGOMBERA		MSITU WA MAGOMBERA		MSITU WA MAGOMBERA	
SHAMBANI MWETU		SHAMBANI		SHAMBANI	
TUNAKATA MAJANI		MSITU WA KIJIJI		MSITU WA KIJIJI	
MAENEO MAWAZI YA MALISHO		MITI YA NYUMBANI		MITI YA NYUMBANI	
		KUNUNUA		KUNUNUA	

GHARAMA YA MAZAO YA MSITU

MKINUNUA KUNI MNANUNUA KWA SHILINGI NGAPI? (KWA MZIGO MOJA?)
TSH _____/=

MKINUNUA DAWA YA KIENYEJI MNANUNUA KWA SHILINGI NGAPI? (DOZI YA WASTANI?)
TSH _____/=

MKINUNUA NGUZO MNANUA KWA SHILINGI NGAPI? (KWA NGUZO MOJA?
TSH _____/=

MKINUNUA MKAA MNANUA KWA SHILINGI NGAPI? (KWA GUNIA MOJA?
TSH _____/=

MKIFUGA NYUKI MNAUZA LITA MOJA KWA BEI GANI?
TSH _____/=

MNAPATA WAPI NGUZO? MNAPATA WAPI MKAA? MNAFUGIA NYUKI WAPI?

ENEO	**ALAMA**	**ENEO**	**ALAMA**	**ENEO**	**ALAMA**
MSITU WA HIFADHI		MSITU WA HIFADHI		MSITU WA HIFADHI	
SHAMBANI		SHAMBANI		SHAMBANI	
MSITU WA KIJIJI		MSITU WA KIJIJI		MSITU WA KIJIJI	
MITI YA NYUMBANI		MITI YA NYUMBANI		HATUFUGI	
KUNUNUA		KUNUNUA			

JE NI KWA KIASI GANI WANAKIJIJI WANATEGEMEA KUNI KWA KUPIKIA NA MATUMIZI BINAFSI?
KIDOGO ☐ **KIASI** ☐ **SANA** ☐

MNAPATA WAPI UMEME? MNAMILIKI SHAMBA? MNAMILIKI NYUMBA?

UMEME	**ALAMA**		**SHAMBA**	**ALAMA**	**UKUBWA /EKA**		**NYUMBA**	**IDADI YA NYUMBA**
HATUNA UMEME WALA TAA			HATUNA SHAMBA/ HATULIMI				TUNAKAA KWENYE NYUMBA YA NDUGU	
HATUNA UMEME TUNATUMIA TAA			TUNAAZIMA SHAMBA				TUNAKODI NYUMBA	
TUNATUMIA BETRI NA SOLAR			TUNAKODISHA SHAMBA KUTOKA MTU BINAFSI				TUNAMILIKI NYUMBA	
TUNATUMIA JENERETA			TUNAKODISHA SHAMBA KUTOKA KIJIJINI					
TUNAYO TANESCO			TUNAMILIKI SHAMBA					
			TUNA HATI MILIKI					

SHUGHULI ZA MAENDELEO

JE, NDANI YA KAYA YENU, KUNA WAFUATAO?:

SHUGHULI ZINAZOFANYWA NA WATU	**WATU WANGAPI KWENYE KAYA YENU WANAOFANYA SHUGHULI HIYO**	**KIPATO KNACHOINGIZWA NA SHUGHULI HIYO(KWA MWAKA)**
WAKULIMA		
WAFUGAJI WA MIFUGO		
WAFANYABIASHARA NDOGO NDOGO		
WAVUVI		
WAUZAJI/WASAFIRISHAJI WA SAMAKI		
WAKUSANAYA MADAWA YA ASILI KWENYE MSITU WA MAGOMBERA		
WATENGENEZA VIFAA VITOKANAVYO NA MSITU (MIKEKA, VIKAPU, MIPINI NA VINYAGO)		
WAFANYAKAZI AU VIBARUA KWENYE MASHAMBA MAKUBWA YA KILIMO N.K.		
WAFANYAKAZI WA SERIKALI		
WAWINDAJI WA WANYAMA PORI		
WAVUNA MBAO		
WAFUGA NYUKI		
WAGANGA WA KIENYEJI		
MAFUNDI SEREMALA		
WAUZAJI WA NISHATI (KUNI AU MKAA)		
SHUGHULI NYINGINE (TAFADHALI ORODHESHA).....		

KIASI GANI CHA FEDHA INAHITAJIKA KWA MATUMIZI YA KILA SIKU?.....

JE KIASI HIKI KINAWATOSHELEZA? **N / H**

KIPINDI KIGUMU

MWEZI WA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
KIPINDI KIGUMU												

KWA NINI WAKATI HUU NI MGUMU ZAIDI?(TAFADHALI ANDIKA SABABU)

1. ……..
2. ……..
3. ……..

WANYAMA PORI

NI MATATIZO GANI YANASABABISHWA NA WANYAMA PORI MNAOPAKANA NAO?.....

MWEZI WA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
WEKA ALAMA KATIKA MWEZI AMBAO USUMBUFU NI MBAYA ZAIDI												

MASWALI KUHUSU UTAWALA WA KIJIJI, ARDHI NA MALI ASILI

KUNA SHIRIKA AMBALO LIMEANZISHA SHUGHULI MBADALA HIVI KARIBUNI HAPA KIJIJINI? **N / H**
KAMA NDIYO, TAFADHALI ORODHESHA HAPA CHINI

4. ……..
5. ……..
6. ……..

KUNA **TAASISI/ AU KAMATI** YEYOTE AMBAYO INASHUGHULIKIA USIMAMIZI WA ARDHI, MAJI NA MISITU HAPA KIJIJINI? **N / H**
TAFADHALI ORODHESHA HAPA CHINI.

1. ……..
2. ……..
3. ……..

KUNA SHERIA AU TARATIBU HAPA KIJIJINI KUHUSU **MGAWANYO WA ARDHI**? **N / H**
KAMA IPO/ZIPO TAFADHALI ORODHESHA HAPA CHINI.

1. ……..
2. ……..
3. ……..

KUNA HUDUMA GANI ZA KIJAMII AMBAZO ZINA MADHARA KATIKA **USIMAMIZI WA ARDHI, MISITU NA MAJI HAPA KIJIJINI?**

1. ……..
2. ……..
3. ……..

UTUNZAJI WA MAZINGIRA UNA/MANUFAA GANI KWA KIJIJI?
INALETA MVUA ☐
KIUCHUMI ☐
MAJI KWAAJILI YA UMWAGILIAJI ☐
UONGEZEKO WA WANYAMA ☐
VIVUTIO VYA WATALII (WANYAMA, MITO, MISITU, MAPOROMOKO YA MAJI NK) ☐

UNAFIKIRI NI IDARA GANI INAWEZA KUSIMAMIA UHIFADHI WA MSITU WA MAGOMERA VIZURI ZAIDI *(Chagua moja tu)*

1. IDARA YA MISITU NA NYUKI ☐
2. IDARA YA WANYAMA PORI ☐

Appendix 3 Livelihood Assessment Checklist

UDZUNGWA MOUNTAINS ~ MAGOMBERA COMMUNITIES

SUSTAINABLE LIVELIHOODS ASSESSMENT

Guidelines & Checklist

The activities are described below. They are based around the following framework, and are designed to gather as much information on livelihoods as possible. The main activity is the livelihood activities discussions which can be expected to take 3-4 hours. These are complemented by a quantitative data questionnaire (separate) and transect walks and semi-structured interviews.

PRIOR TO DISCUSSIONS – SELECTED COMMUNITY MEMBERS

1. TRANSECT WALK

Purpose: To observe and discuss what resources and facilities (natural & physical assets) are there in the village, how people are living day to day (human & social assets) and what livelihood activities are undertaken.

Steps:
Ask the village chairperson if three representatives (ideally male, female and youth) can accompany the team on a walk through the village so that we can build a better understanding of how the village works.
Agree a start and end point with the representatives and time to be taken (max. 30 mins)
Take note of the following on the walk:
Natural assets (i.e. crops, forest, pastures, rivers etc.)
Access to these natural assets by different members of the community (wealth & gender)
Agriculture (rice, maize, vegetables etc.)
Physical assets (shops, market, roads, schools, government buildings)
Access to these physical assets by different members of the community (wealth & gender)
Livelihood activities undertaken at different points
Problems
Opportunities
Keep your eye out for unplanned discoveries. Stop from time to time at particular points and take relevant notes or make diagrams. Take photographs if possible.
After the walk share your findings and relate these to the overall objectives of the study.

2. SEMI-STRUCTURED INTERVIEWS

Semi-structured interviews with key informants and village leaders. The discussion just touches on assets, seasonality, vulnerability and history of the village.

The discussion should then move on to the conservation activities carried out by the village, how these are managed, and where and how the individual sees the village developing it s conservation activities.

LIVELIHOOD DISCUSSIONS (RRA)

In separate groups (grown men, grown women)

1. IDENTIFYING ASSETS
Remember In this context assets refers to the following:

Natural	Land, pastures, forest, rivers, terrestrial life, marine life, biodiversity.
Financial	Savings in the form of cash and liquid assets such as grain, livestock etc.
Human	Knowledge, skills such as beadwork, animal husbandry, good health, ability to work etc.
Physical	Roads and transport, buildings, communications etc.
Social	Networks between individuals, relationships, members of groups etc

WHAT NATURAL ASSETS?
Land, trees, forest products, crops, what crops? Is there intercropping? Agroforestry?
What food crops do you farm?
What cash crops do you farm?
Livestock what amount? Which kinds?
Forest and forest products (timber, building materials, medicines, charcoal, fuelwood, carpentry/carving materials, medicinal)
River, lake life. What types of fish?
Where do the assets come from?

Value of Natural Assets
What value do each of these assets have for you?
Do they have a monetary value? Give some examples?
Through direct sale of the asset, or through utilisation as a livelihood?
Do they have a cultural or religious value? Which? In what sense?

WHAT HUMAN ASSETS?
What skills/capacities do you have?
What Education?
What small businesses are there? How many are involved in these?

WHAT SOCIAL ASSETS?
(Perceived): community institutions and networks
sense of community?
Women's self-help groups, men's self help groups?
How do cultural assets relate to or depend on natural assets?

WHAT FINANCIAL ASSETS?
Do you have savings?
Do you have investments?
Do you have access to credit?

WHAT PHYSICAL ASSETS?
What kind of infrastructure do you have?
What kinds of technology/equipment/machines/tools do they have?
What are the basic social services in the village?

2. LAND TENURE

Land Tenure & Planning:
Has Land use planning has been done in your village?
If yes can you describe the zones and boundaries of your village?
What are the economic activities done in each zone?
Do you have bylaws to monitor activities done in the zoned areas?
Does your village possess the land certificate?
Who is responsible in allocating land in your village?

What is the approval process?
Does the village have land use plans, by-laws, management plans, management agreements etc?
What is the level of implementation/enforcement of these land use plans, by-laws, management plans, resources management agreements?
How much land is available for livelihood activities?
Is there any land not being used? Why not?

3. VULNERABILITY AND SHOCKS

Purpose: To build an understanding of what the external trends, shocks and seasonality are over which people have relatively little control but which affect/influence their livelihood strategies. The vulnerability context has a direct bearing on the hardships that poor people face. The fragility of poor peoples' livelihoods leaves them less able to cope with trends and shocks
Steps:
1. This session should take the form of an open discussion.
2. Ask the group the following questions:
Is the community happy with its current way of life? Why/why not?
Is this a good year or a bad year? Why?
Is this year better or worse than 3 years?
What is the most difficult time of year for you and why?
How do you manage during those months?
Have there been any shocks affecting the community i.e. disease, drought, HIV/Aids, floods?
How did the community cope?
Are natural assets reducing? What is causing a loss of biodiversity?
How does the community cope? Where do you go if there is a loss of assets?
3. Feedback to the community what you have learned to ensure you have correctly interpreted their views.

4. TIME AVAILABLE & SEASONAL CALENDAR

HOW MUCH TIME IS AVALIABLE PER GENDER GROUP
Group should list their average daily activities, dawn until dusk, showing rest time as well as work time. What is the combined available time for a household to engage in market based activities?

SEASONAL CALENDAR – TIME & ACTIVITIES
Group should draw a calendar by filling in a table, showing activities by season, and who carries them out, how long it takes and what crops are growing at that time.

Month/Season	J	F	M	A	M	J	J	A	S	O	N	D
Season/rains												
Income generating activities												
Income - good months, bad months												
Expenditure – highs and lows												
Prices – highs and lows												
Markets – good months, bad months												
Hard times												
What crops grow at this time												
Seasonal opportunities												

4. Ask how they cope during the particularly hard times and when household expenditures are highest? Do they have family and friends they can drawn from (social assets)? Do others cope the same way? Who doesn't cope during these times in the village? Why?
5. What do they do when they have particularly good times? How do they use additional incomes that may be generated at different times during the year?

5. INSTITUTIONS

Purpose: To build an understanding of what the key institutions and individuals are in a community are and their relationships and importance for decision-making around livelihoods.

Steps:
Find out from the group "Which organizations, in and outside the community are involved that particular livelihood activity.

Establish which of these are “more important” or “less important” organizations and why.
Are there village level and district institutions that relate to management of the forests, water land etc (VEC, Resources user groups, associations etc)?

6. FUTURE/ALTERNATIVE LIVELIHOOD ACTIVITIES/AIGs
Are there any economic activities that are being implemented in the area by house holds, groups, e.g. environmentally friendly income generating activities (IGAs)?
If yes, how were these activities initiated and supported?

Moving forward: the future
How do you propose to move forward?
Which livelihoods will be appropriate to the future?
Which alternative livelihoods would reduce pressure on resources but boost incomes?
What are the logistical requirements?
What costs and benefits and limitations are perceived?
What land requirements?
What labour requirements? Which community members would be involved
What capital requirements?
What kind of entrepreneurial or enterprise requirements?
What support requirements from other institutions?

7. VIEWS TOWARDS FOREST CONSERVATION & RESPONSIBILITIES
Start with a series of short answer questions to understand the level of awareness of natural resources and the importance of conservation practices. The list is not exhaustive, nor is it essential that every question is asked. If they don’t know the answer, make sure that their lack of awareness is noted.

These are:
Do you know the regulations that govern the protection of these forests?
Do you know any natural resources policies? Mention them
What activities are allowed in the forest?
What activities are not allowed in the forest? Which areas?
Why the above activities are not allowed?
What are the environmental problems facing the forest if any?
What are the mitigation measures to the above problems?
What are the important factors for successful forest conservation?
What are the benefits of the forests to the adjacent villages?
What are the costs of the forests to the adjacent villages?
What are your roles and responsibilities in conserving these forests?
What are the usages of the rivers and springs?
How would they cope without that supply?
Do you know the forest boundaries?
How can they protect the source of water?

8. VIEWS TOWARDS MANAGEMENT OF MAGOMBERA FOREST
What is the view if the forest is to be annexed as part of the Selous Game Reserve?

9. ENVIRONMENTAL EDUCATION & INITIATIVES

Is/Are there any development and conservation initiatives being implemented by different organizations in the village?
Have you got any environmental education? What did you learn?
Who gave you environmental education? Which community members have it?
What is the existing capacity of both the district and villages in carrying out conservation activities as well as planning and implementation of good land husbandry?
Identifying capacity needs in terms of training, provision of extension services and monitoring of different community programmes

9. RESOURCE USAGE

What is the level of dependency on natural resources (forests, wildlife, and water) and options for alternatives in the village?
What is the level of fuelwood dependency in the villages (time used in collecting fuelwood and the amount consumed by the household)
What is the viewpoint towards using energy saving stoves?

Is their any use of rice husk burned bricks technology for houses construction?
Is this seen as a viable alternative as to reduce the use of firewood in brick burning
Assess whether there is encroachment into forests areas and incidences of illegal logging, farming etc in areas adjacent to the park

10. VIEWS TOWARDS TOURISM

Are there any tourism activities done in the forest or in your village?
What are the tourism attractions present in the forest
How do you think you would benefit from tourism activities?
Have you benefited so far? How? If not, why not

11. AWARENESS RAISING

Refer back to the discussion on views towards conservation, the park and the forests and return to the issues that participants where less aware of. For example, point towards the roles and responsibilities that communities have towards conserving the forest and the benefits this will bring to them. Continue to develop a discussion framed around the importance of maintaining the forests, of whatever type. Close the discussion with many thanks all around and encouragement for the future.