Socio-Economic Study of Forest-Adjacent Communities from Nyanganje Forest to Udzungwa Scarp: A Potential Wildlife Corridor.

Incorporating Livelihood Assessments and Options for Future Management of Udzungwa Forests

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Kilimanyika is a partnership of consultants offering professional services in ecological and socio-economic development activities. Our core focus is the promotion of effective utilisation and management of natural resources in order to support both sustainable economic growth and environmental conservation. Kilimanyika offer consultancy services in project management, research and analysis, strategic guidance and capacity building and work with a range of clients to research, plan, implement and evaluate initiatives. These include stakeholders from agrarian, pastoral and fishing communities, local and international NGOs, governments and businesses operating in a variety of market sectors.

Table of Contents

Tables and Figures

TABLES

FIGURES

Abbreviations and Acronyms

AIG	Alternative Income Generating Activity
CBFM	Community Based Forest Management
CBNRM	Community Based Natural Resource Management
CEPF	Critical Ecosystem Partnership Fund
CFR	Catchment Forest Reserve
CIFOR	Centre for International Forestry Research
CMEAMF	Conservation and Management of the Eastern Arc Mountain Forests Project
DANIDA	Danish Development Assistance
EAMCEF	Eastern Arc Mountains Conservation Endowment 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
IIED	International Institute for Environment and Development (UK)
IUCN	International Union for the Conservation of Nature
JFM	Joint Forest Management
JKT	Jeshi la Kujenga Taifa (Tanzanian National Service)
KVTC	Kilombero Valley Teak Company
LKEMP	Lower Kihansi Environmental Management Project
MNRT	Ministry of Natural Resources and Tourism
MTSN	Museo Tridentino di Scienze Naturali
NGO	Non-governmental Organisation
NORAD	Norwegian Agency for Development Cooperation
ODI	Overseas Development Institute (UK)
PFM	Participatory Forest Management
PRA	Participatory Rural Appraisal
RRA	Rapid Rural Appraisal
SACCOS	Savings and Credit Cooperative Society
SSI	Semi-Structured Interview
TANESCO	Tanzania Electric Supply Company Limited
TANAPA	Tanzania National Parks
TASAF	Tanzania Social Action Fund
TAZARA	Tanzania Zambia Railway
TAWIRI	Tanzania Wildlife Research Institute
TFS	Tanzania Forest Services
UNDP	United Nations Development Programme
VFMP	Village Forest Management Plan
VFLR	Village Land Forest Reserve
WD	Wildlife Division
WWF	World Wide Fund For Nature
Tsh	Tanzanian Shillings

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Executive Summary

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 study aims to provide an understanding of how communities utilise and value the forests and to assess in what ways they are likely to participate in and engage with future forest management activities. The objectives are to generate baseline data on the socio-economic and livelihoods status of communities living adjacent to the forest reserves and to evaluate their capacities and willingness to support improved management regimes aimed at increased conservation of the target forests. The study also offers evaluation of the options for improved management of the forests in the light of this data. Quantitative and qualitative research amongst communities was carried out in 15 villages. The research also involved conducting interviews with a range of stakeholders with influence over forest management activities.

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 an 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.

Communities are, to some degree, aware of their rights as land managers, even if they have not yet been taken through the land use planning process as a whole. Consequently, they are resistant to policing or any attempt to cut themselves off from the forest. Given the sense of a right to management of the forest by communities and the reliance to a lesser or greater degree on the forests, there is need for be greater efforts to be made in offering alternatives to reduce forest dependence whilst still offering benefits. That such a large and growing percentage of the population are migrants (70.3%) is highly significant to this study on a number of levels. It illustrates that the 'community' is not homogenous, being made up of people throughout the country, and implies that the majority migrant population do not have a historical claim to the area, only a recent one. The numbers of local-born residents with a socio-cultural relationship with the forest is decreasing as far fewer young people have such a spiritual connection with the forests.

There are three broadly feasible management regimes to consider. One of these is the current regime of catchment forest reserves mostly under joint forest management, and is proving insufficient as it stands. Two options, management under TANAPA or the establishment of two nature reserves (potentially incorporating the Idete Corridor), are broadly feasible under the right conditions and with measures to counter negative aspects. In order to succeed in the long term, each type of management regime would need to be implemented taking into account the realities and aspirations of the communities (as identified in this study). According to the community in the Idete wildlife corridor area, the forest should be managed by the village government with restricted utilisation following a process of management training and awareness, and patrolled by the FBD or TANAPA with village agreement, as long as there is a management zone where utilisation is permitted. If either a TANAPA or FBD management offer some form of utilisation and benefit-sharing opportunities, they will be able to successfully take over management of the corridor forests with general community support.

Whichever forest management regime is developed for a given area, whether a community management aspect is agreed, or whether communities are required to become better custodians of the forest, a continued programme of environmental education and awareness raising will be essential.

Udzungwa Scarp, Iyondo, Matundu, Nyanganje, Ihanga and Iwonde forest reserves and the 'Idete corridor' forests are of considerable ecological importance for the extent of the biodiversity therein and because of their role as water catchment for the region and the nation as a whole. Maintaining the condition of these forests requires strict management regimes. However, as this study shows, the level of dependence on these forests by adjacent smallholder farming communities living in the Kilombero Valley suggests that in the short term at least a degree of utilisation of these forest areas should be possible under future management regimes. This study has shown that a socio-economic perspective must be considered alongside a ecological perspective in considering future approaches to forest management. The livelihoods of the population in the area generally depend, in part, on forest resources. The views and needs of these communities need to be taken into account. Further to this, the communities must be integral to any successful management regime. If they do not have a sense of ownership or of benefit-sharing, they will have less inclination to look after the forests. Currently, whether cynically or otherwise, the communities indicate a willingness to act as custodians of the forest and this should be encouraged. The area under study is large and the stakeholders many. Thus, greater focus on management options for each individual forest area will be essential.

Scope of Study

1 Importance of the study

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.

2 Background of the Study

There are many stakeholders involved in conservation and/or management of the Udzungwa Mountains forests, including village/ward communities, Regional and District Councils, Government of Tanzania's (GoT) natural resource management authorities (TANAPA, FBD, WD), NGO's (such as WWF), bilateral donor agencies (e.g. DANIDA), multilateral institutions (e.g. UNDP) and researchers from academic institutions (e.g. MTSN). Private enterprises (such as Illovo Sugar and KVTC) also have an significant role in both forest/habitat management activities and developing the economy of the area.

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). The findings of the workshop: 'demonstrated the exceptional biological and ecological values of the Udzungwa forests' (Doody *et al*, 2005) exemplified in the remarks made by the Morogoro Regional Administrative Secretary in his opening speech: 'the loss of these forests would cause an economic and ecological disaster of untold magnitude' (ibid). Particular threats to forests and forest wildlife such as timber cutting, pole cutting, fuel wood and wood harvesting, hunting and fire were discussed.

During the workshop participants identified a need for further information on the current status of the land that could be proposed either for extension of Udzungwa Mountains National Park of for other improved forest management propositions, particularly with regards to the human population living in the area and potential of these areas to be further protected. It was decided that there was a need for a participatory appraisal of community livelihoods and aspirations amongst the population living adjacent to all these areas in order to evaluate their capacity and willingness to support greater environmental protection, including re-establishing connectivity of different protected areas. Thus, bearing in mind different land uses in the area, local communities dependency on the resources and different perceptions of how the forests should be managed and utilised, stakeholders recommended that socio-economic information for the area should be collected and a participatory appraisal carried out.

3 Objective of Study

The study aims to provide an understanding of how communities utilise and value the forests and to assess in what ways they are likely to participate in and engage with future forest management activities. The objectives are to generate baseline data on the socio-economic and livelihoods status of communities living adjacent to the forest reserves (incorporating data on social and economic values of the forest and its products) and to evaluate their capacities and willingness to support improved

management regimes aimed at increased conservation of the target forests. The study also offers evaluation of the options for improved management of the forests in the light of this data.

The study is funded by CEPF and contributes to the CEPF strategic direction 1 & 2, namely: To increase the ability of local populations to benefit from, and contribute to biodiversity conservation and enhancing connectivity among fragmented forest patches in the hotspot in and around Udzungwa.

4 Structure and Method of Study

The study begins with a section called *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 study then goes onto show the results of the research of both consultations with communities living adjacent to the southern Udzungwa Mountains and stakeholders with an important role in the management or guidance of the areas natural resources. Research amongst communities was carried out in 15 villages. These were chosen to best represent the total area under assessment, being villages close to the five forest areas under study. The villages were those adjacent to the line of the forest reserves. The method of research, discussed below, enabled findings to be gathered from a sample population that made up approximately 10% of the total population of the 15 villages.

The research was divided into both quantitative and qualitative data in order to gain a detailed overall understanding; the former allows for specific data, percentages and numbers to be gathered. the latter allows for a more generalised view over a greater number of people. *Results of Quantitative Household Research* section are detailed first. Quantitative research was gathered through questionnaires given to 306 individual respondents (see *Appendix 2*). Typically, 10 men and 10 women were selected at random to fill in these questionnaires per village. The data presented includes household profiles, resource ownership, standards of living and the use and values of the forest and forest products.

In the *Results of Qualitative Livelihoods Research* section which follows is given the results of a research method known as Sustainable Livelihood Assessments. Over 650 people were interviewed through 2 discussion groups (male and female) per village. 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 of the positions of external stakeholders. In livelihood assessments attention is first paid on gathering perceptions of the livelihood assets (forms of capital/resources) available to the communities. Having understood the different assets available to communities as well as the direct and indirect values gathered from these resources, assessments of daily and seasonal activities were carried out. Each livelihood assessment then looked at the level of vulnerability and likelihood of suffering shocks with each group. The final part of each group meeting involved a discussion on forest management and the benefits of conservation for the communities.

The research also involved conducting interviews with a range of stakeholders with influence over forest management activities. The *Findings from Stakeholder Consultations* section details the semi structured interviews held with different stakeholders, both individually and in groups. The findings are stakeholder-led, namely they aim to represent the opinions of those interviewed and can be viewed from that perspective.

The *Discussion and Recommendations* section which follows, summarises and gives analysis of the findings outlined in previous sections, presents options for future management of the forests, and makes general conclusions. It also outlines lessons learnt during the course of the study. Further detail on the methodologies used as well as an example questionnaire and checklist can be found in the appendices.

Context & Literature Review

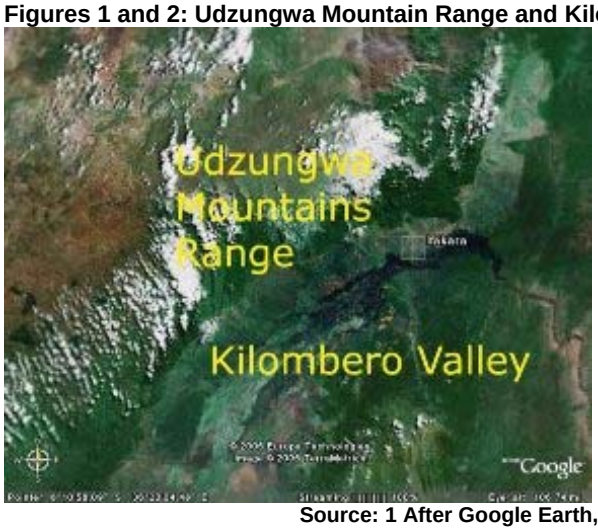
1 Geographical Context

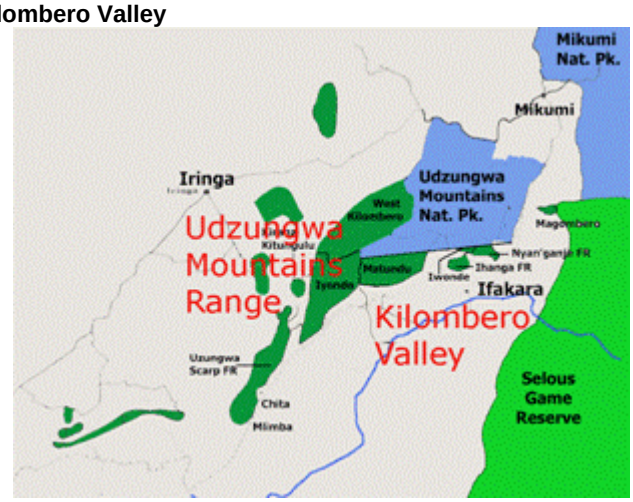
1.1 Location

The Udzungwa Mountains form one of the largest blocks of the Eastern Arc Mountains which combined together with the Coastal Forests of Eastern Africa are recognised one of the worlds' 25 biodiversity hotspots. The Udzungwa block is reported to have the greatest altitudinal range and relatively undisturbed forests (TANAPA, *pers comm*.). The study area begins to the east at Signali/Kiberege villages and runs west along the valley, largely adjacent to forest boundaries, until Chita/Udagaji villages.

The Udzungwa Mountains Range consists of Udungwa Mountains National Park and a number of forest reserves. The **Udzungwa Scarp, Iyondo, Matundu, Nyanganje, Ihanga and Iwonde** forest reserves exist in the Udzungwa Mountains in Kilombero, Kilolo and Mufindi districts in Morogoro and Iringa regions, and are situated to the south, west and south-west of Udzungwa Mountains National Park. This study focuses on these areas, notably the forests which border the Kilombero valley where the mountain range descends, and where the forest borders significant human habitation. Other forest reserves are not within the scope of the study. Figures 1 and 2 indicate the distinct physical difference between the Udzungwa Mountains altitudinal forests and the fertile agricultural and wetland areas of the Kilombero valley to the south/south-east, whilst Table 1 lists the forest adjacent villages under study

Figures 1 and 2: Udzungwa Mountain Range and Kilombero Valley





Source: 1 After Google Earth, 2006; 2 After Doody *et al*, 2005

1.2 Population

The population of Kilombero valley is growing by approximately 3.4% a year, in part due to higher birth than death rates, but significantly, because the area is attractive to migrant labourers typically in search of improved agricultural opportunities, discussed further below. According to the GoT National Bureau of Statistics the population at the 2002 census of Kilombero District was 321,611, of which male and female populations are nearly equal. In the whole area of the Udzungwas there are an estimated 146 villages and a population of nearly 700,000. Table 1 illustrates the population of each of the 15 forest adjacent villages selected for study.

Table 1: Villages studied (showing Adjacent Forest Reserve/Area and population figures)

Forest Reserves/Area	Selected Villages	Population (2002)
Nyanganje	Signali	4,572
	Kiberege	9,774
Iwonde/Ihanga	Ihanga	3,092
	Machipi	2,003
	Kilama	1,647
Iyondo/Matundu	Igima	4,616
	Mpofu	2,705
	Mngeta	4,820
	Njage	2,278
"Idete Corridor"	Idete	6,239
	Namwawala	4,794
Udzungwa Scarp	Mkangawalo	5,838
	Ikule	3,519
	Chita	12,315
	Udagaji	1,744

1.3 Climate & Water

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. Notably though, in 2005-06 continuous rainfall has not occurred, due to drought in the early part of the year.

2 Land Tenure and Forest Management

2.1 Protected Area Status

Most of the remaining forests and biodiversity of the Eastern Arc are now found in Catchment Forest Reserves and other protected areas. However, the degree of recognition of the importance of catchment forests as protected areas remains low. According to TFCG (2005), the Eastern Arc Mountains contain only two reserves that are recognised by the IUCN system of protected areas, namely Mikumi and Udzungwa Mountains National Parks. Forest reserves are 'uncoded'. The Conservation and Management of the Eastern Arc Mountain Forests Project (CMEAMF), funded by UNDP, coordinated by the FBD, with technical inputs from two NGOs - CARE and TFCG, are working with IUCN to code the existing forest reserves and Amani Nature Reserve as protected areas. A core challenge is to seek a globally recognised conservation status for the most important Eastern Arc forests.

2.2 History of Resource Governance

Forest reserves were first gazetted under the German and then British Colonial authorities and maintained by the Tanzanian Government after Independence to date. The first National Forest Policy of Tanzania was established in 1953 and reviewed in 1963. The Government of Tanzania then formulated a new national forest policy in 1998. It accommodated community involvement in conservation, such as through policy statement 39:

> *'Local communities will be encouraged to participate in forest activities. Clearly defined forest land and tree tenure rights will be instituted for local communities, including both men and women.'*

Enabling legislation for the new policy was passed with the new Forest Act of 2002. This provides the legislative foundation for the implementation of Participatory Forest Management (PFM) in Tanzania, discussed below (MNRT, 2001). This act "provides a clear legal basis for communities, groups or individuals across mainland Tanzania to own, manage or co-manage forests under a wide range of conditions." (FBD, 2006)

The range under study was formerly all under forest reserves until Udzungwa Mountains National Park (UMNP) was gazetted in 1992, derived from five existing forest reserves. The remaining forests are maintained as Catchment Forest Reserves.

UMNP is the first Tanzanian National Park declared specifically because of its forests and not because of its large animals. It was specifically created to safeguard the mountains' water catchments and biological values. (TANAPA, 2001b). Due to the long history of safeguarding these forests, whether as forests reserves, or national park, the forest has remained well protected and utilisation by adjacent human populations has been restricted.

2.3 Recommendations for Annexing Key Forest Reserves

Within the Udzungwa range, CMEAMF propose an upgrading of the level of protected area status for **West Kilombero Scarp** and **Udzungwa Scarp Forest Reserves**, either as nature reserves, or as national parks (TFCG, 2005).

Prior to the workshop of December 2004, their had been four recommendations in reports suggesting the West Kilombero Scarp Forest Reserve (not within the scope of this study) should be annexed to Udzungwa Mountains National Park, a view which was reiterated by workshop participants (Doody *et al*, 2005).

CMEAMF have recommended that **Magombera Forest Reserve** in the lowland Udzungwa area (not within the scope of this study) be included within the Selous Game Reserve (TFCG 2005), a suggestion which follows on from a series of recommendations dating back to the 1970s but that has yet to be taken forward (Doody *et al*, 2005).

2.4 Forest and Wildlife Land Tenure

Land can be given over to forests and wildlife areas in a range of different categories, from top down management to bottom up, i.e. from central government, or from the community/village level and a range of different options in between. In brief, they can be summarised in the following tables (adapted from Doody *et al*, 2005).

Table 2: Types of Forest Management Areas

Forest Categories	Description
Nature Reserves	The highest category of forest protected area (new category), does not currently allow human consumptive activities, may have joint agreements (Government and Communities), only current example is the East Usambara (Amani Nature Reserve), can have some zonations for special purposes (e.g. traditional or sacred)
Government Forest Reserve	Forest Reserve under the mandate of the central government and can be managed jointly under JFM, forms the major category of Productive and catchment forests, some are managed by District councils with guidance from FBD, others are major forest biodiversity reserves.
Local Authority Forest Reserve	Under the mandate of local government (e.g. District councils), can be production or catchment and may have joint agreements with communities under JFM
Private Forests	Forest under lease and management by a private company, may be a licensed plantation, may harvest exotic species
Village Land Forest Reserve	Found within village land, managed by village government and a natural resources committee. It can be a productive or protective forest, and is managed under the process of CBFM instigated by the FBD.
Village land	This is land under village government (Village land act 1999 section 7), Can have an approved land use plan which may have multiple uses such as grazing, agriculture, schools, living areas and so forth. In reality many villages do not yet have approved land use plans

Table 3: Types of Wildlife Management Areas

Wildlife Management Categories	Description
National Parks	Managed by TANAPA, for non-consumptive usage only. Can also be for forest management as in the case of UMNP
Game Reserves	Under central government and in some cases managed by the district council, some adjacent areas set aside for WMA's, mainly used for game hunting and capture of animals for zoos, also tourism including specialized activities such as photography
Conservation Area (Special)	Only one exists, the Ngorongoro Conservation Area Authority. Managed by a Government agency, have a multiple land use compatible to both human and wildlife existence, has human settlements (villages and households).
Game Controlled Areas	These fall under the central government but managed by the district through the District Game Officer, they are common areas used for licensed hunting and are usually adjacent to the villages. They can be part of wildlife corridors.
Wildlife Management Areas	These areas may be used for consumptive purposes including licensed hunting, the areas mare normally adjacent to other categories of wildlife management, they are managed with the technical advice of the Wildlife Division.

2.5 Importance of Wildlife Corridors

CMEAMF outline the challenge of enhancing the connectivity between Eastern Arc forest reserves to increase the chances of species survival. Included in these is the area between Matundu and Udzungwa Scarp forest reserves in the Udzungwa range (TFCG, 2005), referred to here as the 'Idete corridor'. The reported consequences of protecting corridors are: populations of protected species populations rapidly recover and expand their range (numbers and distribution); crop-raiding and other human-wildlife conflict increases; increased destruction of forest habitat when large mammal populations are enclosed (Doody *et al*, 2005).

2.6 Role of the Forest in Rural Livelihoods

It is worth taking note of the growing amount of literature on forest values and the role of forests in rural livelihoods. There is a vast amount written on the subject, however some of the key issues are summarised in Byron & Arnold (1997), and three key points are summarised as follows.

With regards to the importance of forests to livelihoods:

> *For millions of people living in forest environments, the forest forms such a dominant part of their physical, material, economic and spiritual lives that its importance is not most appropriately described and assessed in terms of the individual products or services that the forest provides.*

On the use of forests and forest products to supplement nutritional and medicinal needs:

> *Forests and forest trees are the sources of a variety of foods, that supplement and complement what is obtained from agriculture, of fuels with which to cook food, and of a wide range of medicines and other products that contribute to health and hygiene.*

With regards to the use of forest products to meet seasonal food shortages:

> *Forest foods are most extensively used to help meet dietary shortfalls during particular seasons in the year. Many agricultural communities suffer from seasonal food shortages, which commonly occur at the time of year when stored food supplies have dwindled and harvest new crops is only just beginning.*

2.7 Common Pool Resources

Common pool resources (including cultivatable land, forests, grazing areas, coastal habitats, and marine fisheries) are shared by multiple users and support rural livelihoods in diverse ways, providing water, grazing, raw materials for tools and building, fuel, food and marketable goods. These resources also fulfil aesthetic, ritual or spiritual functions within communities.

Such resources support 'traditional' livelihoods but also offer opportunities to support newer economic activities, often linked to private sector enterprises, including eco-tourism. Common pool resources also often provide a safety net to the poor that helps in reducing risk and vulnerability. In utilisation of common resources, sound management is essential to prevent over utilisation and degradation of resources that will affect the long-term benefits to all.

Systems of land tenure and access to common pool resources need to be clarified and strengthened in relation to livelihoods of the poor. Reform can potentially provide both greater security of livelihoods and more sustainable management of common pool resources (see Cousins, B., in Toulmin & Quan, 2000).

2.8 Community Based Natural Resource Management

In Africa, with many conservation initiatives steadily moving away from colonial-rooted concepts that conservation cannot be practiced unless indigenous peoples are removed from natural resource areas, comes the recognition that conservation cannot be guaranteed in the long term without the support of local people (Cock & Koch, 1991; IIED, 1994). CBNRM treats conservation as instrumental to community development- and vice versa. Conservation practitioners have became aware that 'problems faced by wildlife managers are more sociological than biological' (Kideghesho, 1999). Community Based Natural Resource Management (CBNRM) thus seeks to give natural resources a meaningful use-value to rural communities who bear the cost of wildlife and habitat conservation.

The degree of success of CBNRM programmes relies on a number of key factors, summarised here: maintaining biological diversity and endangered species conservation; public sector support; private tenure of land and wildlife resources; community consultation, participation and ultimately self-management; that the benefits to involved local communities are greater than the cost of utilising natural resources through less sustainable means; a long term potential of incoming revenue to avoid reliance on donors and outsider investment; capacity building; and the stability of community institutions. (IIED,1994; Leader-Williams *et al*, 1996; Bourn & Blench, 1999)

2.9 Participatory Forest Management (PFM)

The objective of PFM is sustainable forest management through management or co-management of forest and woodland resources by the communities living adjacent or amongst the forest. PFM may be applied to forests that require full protection, typically catchment forests, or to forests that can be productive under a sustainable harvesting regime, or a combination of the two with management zones. The Tanzanian Government has adopted a new definition of PFM based on work undertaken by the FAO, namely:

> *"The arrangements for management that are negotiated by multiple stakeholders and are based on a set of rights and privileges recognized by the government and widely accepted by resource users; and the process for sharing power among stakeholders to make decisions and exercise control over resource use"*

PFM is characterised by forest-adjacent communities sharing power as well as benefits, and assuming owner/user rights and management of the resources. As such it is a form of CBNRM, described below. Since 1995 more than 500 Village Forest Reserves (VFLRs) have been declared by communities out of communal lands. Tanzanian law recognises two categories of PFM:.

Joint Forest Management (JFM)

JFM allows communities to sign joint forest management agreements with government and other forest owners (FBD, 2006). JFM is applicable where there is a pre-existing local or central government forest reserve. In this instance the forest adjacent communities enter into a Joint Management Agreement with the appropriate reservation authority to share management responsibility and benefits accruing. JFM allows greater governmental control over the resource, for instance of there is a lack of capacity within a community to manage the resource alone. It is criticized for not offering sufficient benefit-sharing to the communities involved. Revenues are reported to be negligible, as they are only made from penalties taken from those caught carrying out unauthorized activities in the forest, which requires management, patrolling and admission of guilt. Typically, JFM has been promoted in the Eastern Arc montane forests ahead of CBFM because of the high level of biodiversity within these forests and the oft-perceived greater risks of deforestation and risk to and water catchments where communities are sole managers. As well as government and Tanzanian NGOs, JFM implementation has been supported by international conservation NGOs including WWF and CARE.

Community-Based Forest Management (CBFM)

CBFM enables local communities to declare and gazette village, group or private forest reserves (FBD, 2006). CBFM is used to refer to cases where there is no pre-existing forest reserve which must be taken into account. Here communities decide to reserve a part of their village lands as a VFLR. Upon provision of an acceptable Village Forest Management Plan (VFMP) including following the implementation of byelaws and a resource assessment, control and ownership of all the forest resources within is devolved to the village government. In practice the process is slow. According to the FBD (2006), By July 2006, 329 VLFRs have been declared by village and district councils. However, only 53 have been gazetted. A lack of perceived financial incentives for individual community members, both short and long term is blamed for the slow implementation of CBFM, as well as delays in bringing donor funding to an implementation level.

3 Socio-Economic Research

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.

The study revealed a lack of awareness with regards to TANAPA and to the level of resource rights the community had with the forest, although the environmental benefits of conserving the forest were well known. There were complaints across the community about their loss of access. Communication between UMNP authorities and the communities was seen to be improving after a difficult start and the population was said to view the overall benefits of the park as greater than the costs.

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 (79% with only primary education) and indicated the difficulties of raising awareness of new ideas or innovations with a poorly educated population.

The 2004 study found that farming is the major source of livelihood activity for majority of households. Food production therefore constitutes the majority of peoples time and the majority of respondents faced food insecurity at certain times of the year. This is attributed in part to the need to sell a high proportion of production for income generation to meet basic needs, rather than keeping agricultural surpluses in storage for times of hardship. The 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.

Results of Quantitative Household Research

1 Household Survey

1.1 Household profile

The research illustrated male dominance over the social structure of the communities and over the household. Of the equal number of men and women interviewed, it was identified that 88.9% of households are managed by men. Of the 11.1% of households identified as managed by women, 53% were managed by widows and the remainder by unmarried women. The average household is made of 3.2 people, typically indicating husband, wife and child(ren). The average age of the head of household is 42 years old. The low numbers of children in the data reflects two realities for the people of this area. One, is that many are migrants to the area, discussed below, some only recently settled, the other is the relatively mature age of the sample of heads of households indicates that for many, their children have grown up and left home.

1.2 Migrant Population

The majority of the population are not native to the area. The area is highly popular with outsiders. A considerable 70.3% of heads of households are migrants to the area. Only 29.7% are born in their village environs. Their places of origin vary considerably, from across southern, central, western and eastern Tanzania, at table 7 illustrates. The most common places of origin were Iringa (16.3% of migrants) and Ulanga (17.2% of migrants).

Table 4: Showing place of origin for migrant population surveyed

Place of Origin	**% From**
Iringa	16.3%
Mbeya	9.8%
Mahenge (Ulanga)	6.5%
Songea	6.0%
Malinyi (Ulanga)	5.6%
Ulanga	5.1%
Dar es Salaam	3.3%
Ifakara	3.3%
Kilosa	3.3%
Morogoro	2.8%
Mtwara	2.8%
Njombe	2.3%
Lindi	1.9%
Dodoma	1.4%
Liwale	1.4%
Mlimba	1.4%
Tabora	1.4%
Kagera	0.9%
Mwanza	0.9%
Shinyanga	0.9%
Others	22.8%
	100.0%

The survey indicates movement into the area at least since the 1950s, at a steadily increasing rate up to the late 1990s, with some decline apparent since then according to the sample (see table 8). Notably, 37% of migrant respondents arrived during the 1990s.

Table 5: Timeline of Migration, as a percentage of respondents

Year	no	%
1940-1949	1	0.5%
1950-1959	3	1.4%
1960-1969	9	4.2%
1970-1979	37	17.2%
1980-1989	46	21.4%
1990-1999	**80**	**37.2%**
2000-2009	39	18.1%
	215	**100.0%**

1.3 Reasons for migration

Both quantitative data and qualitative data gathered make it apparent that the area's attraction to outsiders is the prospect of opportunities in agriculture (both real and perceived). 78% of migrant respondents came to the area for this reason, and many continue to do so.

Others have migrated to the area because of piecemeal employment opportunities, often related to work on plantations. A small but significant percentage of the older respondents arrived in the area to assist the building of the TAZARA railway during the 1970s.

Table 6: Reason cited for moving to the area

Reason for Coming	Sample	Percentage
Farming Opportunities	168	78.1%
Migrant Labour	24	11.2%
Labourer TAZARA Railway (1970s)	6	2.8%
General Improved Livelihoods	5	2.3%
Family Connections	5	2.3%
Business Opportunities	5	2.3%
Improved Education	2	0.9%
	215	**100.0%**

2 Land and Home Ownership

Very few people own land, and little land use planning has been carried out (see *Results of Qualitative Livelihoods Research*).

2.1 Land Ownership and Acreage

It is significant that whilst the majority of respondents stated that they 'own' their land, very few have title deeds. This represents patterns of land ownership in the area. Land is formally allocated by village assemblies and councils for use by households/individuals for both housing and cultivation. However, the land remains under the ownership of villages, and the majority of the villages have not had a formal land use planning process carried out. Thus, in effect, the land is not formally 'owned' by the household heads, but by the village.

Table 7: Degree of Land Ownership

Level of Ownership	No of Respondents	Percentage
No Land	3	1.0%
Borrow Land	7	2.3%
Rent Land	39	12.7%
Own Land	255	83.3%
Title Deed	5	1.6%
	309	**101.0%**

Multiple Responses Allowed

For all respondents with some land allocation, across 15 villages, the average acreage of land for each household is four acres. When divided into the type of ownership, results reveal that for those that own their land, there is a significantly higher average acreage allocated than those borrowing or renting.

Table 8: Average acreage of land, by ownership type

Ownership Type	Average Acreage
Borrow Land	1.6
Rent Land	1.6
Own Land	4.6
Title Deed	2.5

2.2 Home Ownership

It is typical, within the communities surveyed, for individual households to build their own houses once they have settled into a new area and have been allocated or have procured a certain area of land. It is significant that people will build houses on land that is not legally theirs. 92% of respondents owned their own houses.

Further, it is relatively common for a household to have a second house on their land, indeed the average number of houses for all respondents is **1.3 per household**. Often the second house is of a cheaper/less permanent building material than the first home.

Table 9: Type of home ownership

Type of Home Ownership	No of Respondents	Percentage
Family Members house	3	1.0%
Rent House	18	5.9%
Own House	282	92.2%
Not stated	3	1.0%
		100.0%

3 Standards of Living

3.1 Housing Conditions

73% of respondents were living in brick/cement houses, indicating that whilst income levels are low, living standards are higher than in many other parts of the country. This also indicates that people feel settled in the area and intend to stay there, as they are willing to invest in building houses. It also indicates that use of local forest products as building materials is not a major problem and most of the bricks are fired using rice husks rather than wood. Similarly, the 53% of respondents using iron sheeting for roofing rather than grass or thatch indicates a permanence of settlement.

Table 10: Type of wall, as an overall percentage

Wall Type	Sample	Percentage
Sticks/poles	38	12.4%
Mud	50	16.3%
Bricks/Cement	223	72.9%
	311	**101.6%**

Multiple Responses Allowed

Table 11: Type of roof, as an overall percentage

Roof Type	Sample	Percentage
No roof	1	0.3%
Grass	148	48.4%
Thatch	5	1.6%
Iron sheets	163	53.3%
	317	**103.6%**

Multiple Responses Allowed

3.2 Animal Husbandry

A significant proportion of respondents (28.8%) do not keep livestock of any kind. However the majority do. 65.4% keep poultry (chickens and ducks) in favour of other forms of livestock. Largely this is due to the fact that most village land is set aside for cultivation rather than livestock, and poultry are relatively inexpensive to keep, in small areas, and the incidence of ticks coming from the forests affecting the livestock. It is also due to the fact that there is little habit of livestock rearing amongst these agrarian communities.

Table 12: Type of livestock held per household

Livestock Type	Sample	Percentage
No livestock	88	28.8%
Chickens/ducks	200	65.4%
Goats/Sheep	17	5.6%
Cattle	8	2.6%
Pigs	20	6.5%
	333	108.8%

Multiple Responses Allowed

For those who keep livestock , the average number kept is given below. For example, the average poultry farmer within the sample has 11 chickens/ducks within his/her household.

Table 13: Average no of livestock per household

Livestock Type	No of Livestock Farmers sampled	No of Livestock overall	Average No Livestock per person
Chickens/ducks	200	2207	11.0
Goats/Sheep	17	78	4.6
Cattle	8	16	2.0
Pigs	20	80	4.0

3.3 Transport

Transport opportunities are very restricted for the area's residents. Only one respondent had a car. 31% have no transport at all, and 69% have bicycles. Most people travel by foot or by bicycle or by getting lifts with private and public transport.

Table 14: Type of transport per household as a percentage

Transport Type	Sample Size	Percentage
None	93	31.0%
Bicycle	206	68.7%
Motorbike	0	0.0%
Car	1	0.3%
	300	100.0%

3.4 Source of Water

Despite the considerable amount of water running of the Udzungwa Mountain range, facilities for access to water for the majority of respondents are still very basic, and usually rely on the village government facilities: 85 % rely on community wells or pumps.

The reliance on forest reserves is significant, with a stated 7% of respondents (likely to be more) drawing their water freely from rivers, streams or other water sources within the forests.

Table 15: Source of water for household use

Water Source	Sample	Percentage
River/Community Well/Pump	259	84.6%
Forest Reserve	21	6.9%
Private Well	25	8.2%
Private Piping	7	2.3%
In-house plumbing	3	1.0%
In-house tank	0	0.0%
	315	**102.9%**

Multiple Responses Allowed

3.5 Source of Electricity/Light

The vast majority of respondents do not have access to electricity. Under half of respondents are able to light their homes with kerosene lamps, the majority do not have light after dark.

Table 16: Source of Electricity/Light

Source of Electricity/Light	No Of Respondents	Percentage
None	183	59.8%
Kerosene Lamp	123	40.2%
Battery	0	0.0%
Solar/Generator	0	0.0%
TANESCO	2	0.7%
	308	**100.7%**

Multiple Responses Allowed

4 Use of Forest and Surrounding Areas

4.1 Source of Grazing Pasture

For those who graze their livestock, a majority of 71% graze in “any open area”. Typically this is understood to mean the area local to their houses, a point exemplified by the fact that only 1% of respondents say they graze in the forests. It is notable both that this is not a pastoral community, with most livestock being poultry and that qualitative research shoes an animosity from these essentially agricultural respondents to pastoralists. Further, since July 2006, pastoralism is no longer permitted as an activity within the Kilombero valley outside homesteads, precisely because it is an area of high agricultural productivity.

Table 17: Source of grazing pasture per household

Source of Grazing	No. Respondents	Percentage use
Forest Reserve	2	1.0%
Farm	56	28.1%
Any Open Area	141	70.9%
	199	**100.0%**

4.2 Source of Fuelwood

The issue of where Fuelwood is gathered is of central importance to a study of this kind, reflecting as it does, the degree or otherwise of reliance on forest products for energy needs. With Fuelwood, usage is varied. Only 14.4% of respondents state they gather their firewood from the neighbouring forest reserve. This low percentage is likely to be higher and reflects an unwillingness by many community members to acknowledge use of the forest due to knowledge that it is a catchment forest, and therefore the activity is officially speaking poaching, and in part a change of habit (of reduced firewood collection) related to awareness of forest conservation regulations.

Table 18: Source of fuelwood per household

Source of Fuelwood	Sample Size	Percentage
Forest Reserve	44	14.4%
Farm	113	36.9%
Community Forest	76	24.8%
Own Trees	28	9.2%
Bought	62	20.3%
	323	**105.6%**

Multiple Responses Allowed

4.3 Source of Medicines

The majority of medicines, whether forest products or pharmaceuticals are bought. Respondents state 71% of their medicines are purchased. However a significant number are found locally, particularly in community forests. An encouraging number (7.2%) of individual households are cultivating natural medicines on their farms for home use, and in discussions many understood the opportunity a domestic supply of medicines may bring.

Table 19: Source of medicines per household

Source of medicine	No. Respondents	Percentage use
Forest Reserve	21	6.9%
Farm	22	7.2%
Community Forest	45	14.7%
Own Trees	12	3.9%
Bought	218	71.2%
	318	**103.9%**

Multiple Responses Allowed

4.4 Source of Building Poles

Despite the illegality of taking cut wood from the forest reserves, 19% of respondents state they source their building poles from the forest reserves.

Table 20: Source of building poles per household

Source of Building Poles	No. Respondents	Percentage use
Forest Reserve	57	18.63%
Farm	79	25.82%
Community Forest	80	26.14%
Own Trees	16	5.23%
Bought	69	22.55%
Not Stated	5	1.63%
	306	**100.00%**

4.5 Source of Charcoal

A majority of respondents, 55%, state that they buy charcoal rather than making it themselves. In discussions it was indicated that this was a change of habit related to lack of access to the forest in recent times compared with greater access in the past because they are now restricted from doing so.

Table 21: Source of charcoal per household

Source of Charcoal Poles	No. Respondents	Percentage use
Forest Reserve	16	5.2%
Farm	30	9.8%
Community Forest	35	11.4%
Own Trees	14	4.6%
Bought	169	55.2%
Do not use	42	13.7%
	306	**100.0%**

4.6 Source of Beekeeping Activities

Despite the apparent importance of beekeeping as a sustainable income generating activity, under 17% of households keep bees.

Table 22: Source of beekeeping activities per household

Source of Beekeeping Activities	No. Respondents	Percentage use
Forest Reserve	19	6.2%
Farm	5	1.6%
Community Forest	27	8.8%
Do not keep bees	233	76.1%
Not Stated	22	7.2%
	306	**100.0%**

5 Values of the Forest

An assessment of values was carried out on items which either are direct forest products or are, such as in medicines are either forest products or pharmaceutical alternatives. The aim of this exercise was to measure the value of these items, all of which are at once core to livelihoods, but also generally sourced from surrounding forest. Quantifiable economic values were assessed by questioning households across 15 villages, and the averages of stated costs of key items are given below. It should be noted that the benefits of hunting if and where they may be found where not considered as a value below because they where not mentioned by respondents, owing to the knowledge that hunting is illegal.

Table 23: Average values of forest products

Item	Sample Size	Average Value (TSh/=)
Bundle of Firewood	188	613
Dose of Medicine	184	1,946
One Building Pole	187	515
Handful of Charcoal	19	197
Sack of Charcoal	204	3,666
Litre of Local Honey	114	2,146

A related exercise was carried out in the *Qualitative Livelihoods Research* section, below.

6 Livelihood Activities

Agriculture is considerably more important to peoples livelihoods in this area than any other livelihood activity. There is a notable lack of stated involvement in beekeeping, and only one occurrence of logging, although it can be expected that respondents would not admit if they were loggers.

Table 24: No of households engaged in specific livelihood activities

Livelihood Activity	Brings Money	Brings Food
Agriculture	165	299
Livestock	85	81
Small Business	109	28
Artisanal Work	42	16
Fishing	12	9
Piecemeal Labour	14	6
Beekeeping	7	6
Logging	1	1

Multiple Responses Allowed

Note that tourism, discussed elsewhere, was not mentioned as a livelihood activity.

98% of the 306 respondents interviewed state that their involvement in agriculture is for their food source. Over a quarter of respondents also rely on their livestock as a source of food.

Table 25: "Livelihood Activity Brings Food Directly to Us"

Livelihood Activity	No of Respondents	Percentage of Sample
Agriculture	299	97.7%
Livestock	81	26.5%
Small Business	28	9.2%
Artisanal Work	16	5.2%
Fishing	9	2.9%
Piecemeal Labour	6	2.0%
Beekeeping	6	2.0%
Logging	1	0.3%
	446	**145.8%**

Multiple Responses Allowed

As a source of cash income, agriculture is still the most important livelihood for 54% of respondents. However, animal husbandry, small businesses and artisanal work are also key income generation activities.

Table 26: "Livelihood Activity Brings Money Directly to Us"

Livelihood Activity	No of Respondents	Percentage of Sample
Agriculture	165	53.9%
Livestock	85	27.8%
Small Business	109	35.6%
Artisanal Work	42	13.7%
Fishing	12	3.9%
Piecemeal Labour	14	4.6%
Beekeeping	7	2.3%
Logging	1	0.3%
	435	**142.2%**

Multiple Responses Allowed

With regards to assessing livelihoods that have an impact on the forest environment, the results are as follows. Where a household carries out this activity, per household, there are on average 2.6 people involved in farming and an average of 1.2 people involved in animal husbandry.

Table 27: Average no of people per household carrying out specific livelihood activities

Livelihood Activity	No. of People Carrying out Activity	Average no of People in each Household carrying out Activity
Logging	7	0.0
Hunting	10	0.0
Farming	803	2.6
Livestock	377	1.2
Forest Medicines	24	0.1
Forest Product Crafts	180	0.6
Piecemeal Employment	164	0.5

6.1 Favourite Livelihood Activities

The matrix given below clearly shows the importance of agriculture as the most important livelihood activity to the communities surveyed. 97% of respondents stated that agriculture was of foremost importance to them. Animal husbandry and small business are seen as reliable secondary and tertiary activities, and to a lesser degree artisanal work.

Table 28: Favourite Livelihood Activity – In Order of Priority

Livelihood Activity	1st	2nd	3rd	4th
Agriculture	**97.7**	1.6	0	0
Livestock	1.3	**24.8**	**5.9**	0.7
Small Business	1.3	**26.1**	**7.2**	1
Piecemeal Labour	1.3	2.6	1	0
Beekeeping	0.3	0.7	0.7	0
Fishing	0.4	2.9	0.3	0.3
Artisanal Work	1	**9.8**	2.9	0.7
Logging	0	0	0.3	0

Multiple Responses Allowed

Results of Qualitative Livelihoods Research

1 Assets and Values

1.1 Natural Assets

People perceive their surrounding natural environment as presenting natural assets. Therefore, as well as the village lands, forest areas (including forest reserves) are regarded as a principle source of natural assets. Natural assets are perceived as valuable. Estimation of the typical values of natural assets deriving from the forest was gained in each village through discussions. As a general rule, men are more likely to view natural resources as having a monetary value than women who are more likely to view natural resources as having a cultural value, or only a value within the home. Land is usually the first asset mentioned, more attention to which is given below. This is typically followed by a description of the natural environment being an asset to the community: mountains, forests, valleys, rivers, rainfall, stones, the earth and its minerals.

Forests

The surrounding or bordering forest is of importance to all groups. As a natural asset, forests are considered the most important. However, awareness of the ownership of the forest, or often the name of the forest, is often opaque, particularly amongst women.

Some groups are able to mentally list a number of forests. Where the neighbouring forest is a reserve, it is often named. Then a local forest is sometimes named, such as Njage Forest or Vipenge Forest. It is not clear amongst all communities where the dividing line between a forest reserve and a 'community' forest lies, or indeed, if some of the local names given to the forest are in reality referring to the forest reserve. Others, especially women, refer to the forested mountain range as a whole with a generic name, i.e. 'Udzungwa'.

In Namwawala, one of the villages in the 'Idete corridor', several forests are named: Matundu Forest (the nearest forest reserve) and forests without reserve status, namely; Ikwambe Forest, Namwai Forest, Popo Forest and Mbaya Forest. In Idete, the other corridor village surveyed, both male and female respondents where not clear of the differences between the direct types of forest, lending them to confusion about ownership and management.

Trees

Trees are commonly cited as natural assets, particularly 'Mianzi' bamboo, 'Miombo' (*Brachystegia spp.,* 'Mikuyu' *(Ficus* spp.) and marketable species such as 'Mininga' (*Pterocarpus spp.),* 'Mipingo' *(Dalbergia melanoxylon*), 'Mivule' *(Milicia excelsa)* and 'Mikangazi' *(Khaya* spp.)

Forest Products

The following forest products were suggested as natural assets by the majority of groups: firewood, natural medicines, bees/honey, charcoal, timber, building poles, carvings, mushrooms, grass, birds, and wild animals.

Rivers & Fish

Rivers are seen as essential to livelihoods and it is acknowledged that the source of these is the forest/mountains. Respondents typically mentioned their reliance on two to four rivers for water, both perennial and seasonal.

Within these rivers, a variety of fish were mentioned across the survey area, usually sourced for food, and other times for sale. Most common of those cited were 'Perege' (Tilapia), 'Kambare' (mud fish) and 'Dagaa' (sardines).

Wildlife

Baboons, vervet, both black and white and red Colobus monkeys, puku antelope and bushpigs were commonly cited. Elephants and buffalo were seen as natural assets for the 'Idete corridor' villages. It is notable that wildlife are cited as assets, as they currently bring more costs than gain to most respondents discussed. Therefore it is both a measure of successful environmental awareness campaigns to date and an understanding that tourism may in future bring income derived from the existence of these wildlife that community members rate their value.

Food Crops

Food crops are considered natural assets. Whether grown as a monocrop, or more typically, through intercropping, the following types of food crops were cited: maize, rice, bananas, sugar cane, potatoes, sweet potatoes, millet, finger millet, tomatoes, legumes, soya, sunflowers, cassava, groundnuts and a range of green vegetables.

Cash Crops

Those most valuable to the communities are rice, maize, sesame, sugar cane and millet.

Livestock

Community respondents cited cattle, sheep, goats, pigs, poultry and domestic dogs as assets.

Forest Derived Assets

Values varied considerably but are good indicators. A more precise assessment of the average values of a selection of the following forest derived natural resources has been given in the *Quantitative Household Survey* section.

Table 29: Perceived Value of Forest Derived Natural Assets

Natural Asset	Unit	Typical Value Range (TSh /=)	Economic Value to Community?	Social/Cultural Value to Community?
Bamboo Poles	Pole	50 to 500	Yes for many	For building homes
Bushmeat	Piece	800 to 1200	Yes for a minority (restricted)	Stated as uncommon usage (restricted)
Charcoal	Sack	2000 to 4000	Value increased due to restrictions; fewer sellers	Key, but reducing, source of energy
Firewood	Bundle	200 to 1000	Yes for many	Essential source of energy
Grass	Bundle	200 to 300	Yes for many	Used for building and as livestock feed
Gravel	Lorry	45000	Yes for a minority	For local building
Hoe Handle	Item	200 to 300	Yes for a minority	Used for farming
Honey	Litre	1000 to 3000	Yes for a significant minority	Minimum household value
Mushrooms	Plateful	200 to 300	Yes for a minority	Used for food especially during hard times
Natural Medicines	Bundle	300 to 700	Yes for specialists (trained healers)	More commonly for home use, cultural value
Sand	Bucket	100	Yes for a minority	For local building

Natural Asset	Unit	Typical Value Range (TSh /=)	Economic Value to Community?	Social/Cultural Value to Community?
Stones	Lorry	20000	Yes for a minority	For local building
Timber	12' by 1'	3000 to 4000	Reducing benefits (restricted)	For building homes; reduced usage (restricted)

Land Values

Land is valued at between 20,000/= and 30,000/= TSh per acre in villages.

Livelihood Activities Using Natural Assets

All of the stated livelihood activities given in the *Quantitative Household Survey* section rely on natural assets according to community respondents across the sample, namely:

Trees & Deadwood Poles for Building; Timber extraction (reduced) for sale; wood for building hives, trees for locating hives for beekeeping, timber for carpentry/furniture making; Wood for making agricultural implements; Fuelwood for cooking, blacksmithing, brewing local alcohol, occasionally for brick making (usually fired with rice husks); Charcoal for cooking and blacksmithing

Forest Products Medicines for healing; Mushrooms for eating;

Water Rivers for water supply; Fish for food and business

Climate Communities indicate the importance of the mountains and forests in providing a climate conducive to good farming opportunities, particularly in guaranteeing rainfall.

Cultural Value of the Forest

For all communities surveyed, the forest is seen to have a significant cultural or spiritual value that is essential to the social framework of the village communities, particular among the older generation and those who are well established in the area. The forest is seen by many as 'life giving'; for example it is referred to as 'Kaajafiaki' – source of life - as another name for Iwonde Forest Reserve by respondents in Machipi village.

Certain areas of the forest are considered sacred and are used for ceremonial activities. These include sacrificial activities including rituals dedicated to bringing rain during times of drought, or to reducing rainfall in times of flooding. Coming of age ceremonies also involve the forest.

These ceremonies still carry a great deal of belief in them, across the sample area, and a range of respondents stated that during the recent droughts they prayed for rain in this manner and were successful in doing so. However, there are strong signs from the younger respondents that faith in the success of these rituals is diminishing. Coupled with the fact that many village members are migrants to the area mean that belief in and understanding of these practices are on the wane.

The implications of a reduced belief in the spiritual importance of the forest is likely to reduce the belief in the importance of conserving the forest unless alternative education, such as environmental awareness, is increased in place of diminishing spiritual values.

1.2 Human Assets

Skills

Depending on the size of the village, there are generally considered to be quite a broad range of skill-sets carried by community members and often utilised in artisanal trade. As a broad generalisation, business skills are most common amongst women, artisanal trade in men.

For men, skills have been developed for carrying out the following livelihood practices: farmers (everyone), teachers, fishers, healers, potters, carpenters, masons, plumbers, painters, mechanics, tailors, pit sawers, thatchers, blacksmiths and electricians.

For women: farmers (everyone), teachers, healers, potters, tailors, weavers, hairdressers, clothes seller, sundries seller, cooked food seller, fresh fruit and groceries seller, local brewing and alcohol selling, other small business skills.

Education

However respondents, especially women, often remarked that they do not have many skills and capacities because of their low level of education. In a typical group size of 20 whilst the majority had been to primary school, usually only one or two individuals (normally from the men's groups) may have had a secondary education, and amongst those, form four level was usually the maximum level reached. Notably, it is unlikely that the sample would pick those with high education levels because it is reported that those who are very successful tend to leave the area.

All respondents questioned on this subject said that it was a lack of funds that had prevented them from going to secondary school in most cases. However, it is notable that many women believe their children are now getting better opportunities as the education system has considerably improved in recent years.

1.3 Social Assets

The most commonly stated community groups are centred around churches and mosques and the religious life of the village community. Second to these are self-help groups set up by community members. Some of these are of mixed gender, for example beekeeping or Soya production groups, often those that have been set up with outside support. However, it is more common to find groups divided by gender, and these seem to be more dynamic. Women's groups are more common than men's groups and are more likely to be active. Many groups appear to be dormant. This may in part be due to the fact that if they have been set up by external parties who have since left (such as an NGO), there is often a lack of will or leadership, or crucially, financial capacity, to keep them going. The lesson from this is to ensure that groups set up and done so with full ownership of community members and taking their aspirations fully into account.

Groups include beekeeping groups, rice and other crop production groups, tree planting groups, food vendoring groups, fishing groups, livestock groups and death and burial groups (the latter, where each member sets aside a contribution for when there is a death in the close family of one of the members).

1.4 Financial Assets

Savings

Very few respondents claim to have any savings. For those men that do, they have individual bank accounts in Ifakara town. Women with individual savings often keep them in a box within their home, or in bank accounts. Women occasionally have savings within a self-help group where they maintain a group bank account in Ifakara.

Investments

Very few women claim to have investments. A slightly higher number of male respondents do, however the overall number is low. Investments were considered property such as their homes, milling machines or bicycles, namely items that depreciate in value. Others refer to stocking harvested crops as an investment. None spoke of having significantly appreciating financial assets.

Access to Credit

Access to microcredit in rural areas is difficult. For the majority of villages sampled, microfinance institutions such as SACCOS and FINCA are slowly becoming known to the communities, but with a slow take-up. FINCA only supply loans to women. Few men have any involvement with microfinance, but a number of women's groups do, and a minority of female individuals. High interest rates, lack of collateral and, for most, the long distance to Ifakara make respondents sceptical about success. Further limitations are a lack of start-up capital to put down as deposits and difficulty in paying back loans due to low income enterprises, poor financial planning and insufficient knowledge of bookkeeping, cash flow management and the inability to control that the money is spent on the enterprise that is was lent for.

Instances of non payment are therefore common (the average repayment rate in Tanzania is only 55% (Adkins, 2004), and occasionally individuals have been known to flee the area. With peer-loan agreements this means the responsibility of repayment falls to the rest of the group, or the individual's family. In collateral-loan agreements this means collateral, such as land, or a house, or possessions, can be reclaimed by the institution.

During difficult times therefore, both men and women often borrow cash from wealthy individuals, with repayments made in kind – typically in rice - with a very high level of interest. For example, an individual might borrow 5,000/= in January and have to repay a sack of grain worth at least 20,000/= in June if he or she were able to sell it. This is common. Again, instances on non payment occasionally occur, where the individual flees the area rather than pay their debt.

1.5 Physical Assets

Typical physical assets identified for sample villages in discussions are as follows:

- Dispensary (in most villages)
- Milling machines
- Primary School (s)
- Roads and tracks
- Secondary School (not in all villages)
- Shallow well(s)
- TANESCO poles (not in all villages, passing through village but usually not connected to village – only in Kiberege was there access to electricity)
- TAZARA railway line

2 Livelihood Activities

2.1 Importance of Different Activities

Agriculture is the most important livelihood activity, supported by small business and artisanal labour, and then a range of other activities detailed under *Human Assets* and in the *Quantitative Household Survey* section.

Of additional note, criteria were assessed as to why a particular livelihood activity was most important to a group, and the typical response is given below.

Table 30: Criteria for a livelihood activity being important

Criteria for Livelihood being important	Livelihood Activity
Get good income from the activity	Agriculture/Business
Does not take much time	Business/Artisanal Labour
Lots of resources for activity	Agriculture
Access is good	Agriculture
Easy to do	Agriculture
We have the skills required	Agriculture
Can do year round	Business/Artisanal Labour
Brings additional/supplementary income	Business/Artisanal Labour

As is clear with other data presented related to livelihood activities, the respondents are fundamentally of a farming community who diversify into business and artisanal trades to supplement their incomes from agriculture, especially when it is not possible to farm. Indeed, when asked what livelihood activities they would like to develop in the future, the majority of respondents said their focus was on improving farming activities – through better inputs, better irrigation, access to markets and access to capital.

2.2 Household Income

According to discussions, the average income reported by men's groups is TSh 45,000/= per month. Notably, the average income reported by women is TSh 30,000/= per month, suggesting that women do not see as much of the overall household income as men.

3 Activities Timetable

3.1 Seasonal Calendar

Table 31: Seasonal Calendar (indicating easier and difficult periods)

Month/Season	J	F	M	A	M	J	J	A	S	O	N	D
Rains Most Likely												
Plentiful free time												
Income generating activities most profitable												
Overall income highest												
Markets – good months												
Expenditure highest												
Prices at highest												
Human Disease Most Likely												
Hardest times to live												

The data reveals that January to April is the most difficult time. Discussions also show that July to September are the easiest times for the communities. During this time villagers throughout the sample reported this period as a time of relaxing, drinking alcohol, a time of weddings – and sometimes divorces –and a time for ceremonies such as rites of passage for boys and girls entering into adulthood. It is a period when the community collectively regain energy and interest in life in expectation of the difficult times that follow. If there is any additional income gathered during good times it is usually used for paying school fees and buying clothes, alongside for general enjoyment as mentioned.

3.2 Daily Activities

Across the sample, women are reported to have a busier day to day timetable than men because as well as farming and other livelihood activities women also have the added tasks of the majority of firewood collection, water collection, housekeeping, cooking and caring for children. However, men are reported more likely to spend greater time at labour in the fields.

Table 32: Typical Day for Women

Time	Activities
0545 - 0730	Household Activities and breakfast
0730 - 1400	Farm Activities
1400 - 1600	Lunch
1600 - 1800	Rest/Farm Activities/Household Activities
1800 - 2000	Dinner preparation
2000 - 2100	Dinner, bed

Table 33: Typical Day for Men

Time	Activities
0600 - 0630	Breakfast
0630 - 1400	Farm Activities
1400 -1500	Lunch
1500 - 1800	Farm Activities
1800 - 2000	Rest
2000 - 2100	Dinner, bed

4 Land Use Planning

Respondents across the 15 sample villages were asked if there has been land use planning in their villages. Only in Kiberege village has the process of land use planning been completed according to respondents sampled. For other villages, either the initial planning exercise has been carried out but not implemented, or more commonly nothing has been done at all.

The ramifications of a lack of land planning mean that the community do not officially own the land or its resources, making it difficult to access collateral, and reducing a sense of ownership and responsibility for the area. Nor is it possible for them to manage adjacent forests under a CBFM regime until this has been done. Nor is possible to officially allocate zones for specific livelihood activities or for conservation areas. Many respondents did not understand the importance of land use planning for their village, being used to the Ujamaa system of all land being managed by the village government with approval of the village assembly, but lacking actual deed of title.

Notably, respondents typically stated that within their individual villages there is little remaining land available for community usage, with most plots allocated. While this perception exists, and without proper management planning for village and (some) forest land areas, there will be both a temptation as well as a practice of increasing shifting cultivation activities into the forest by clearing and burning the forest, then planting.

5 Vulnerability and Shocks

5.1 Vulnerable Periods

This analysis began with a comparison of the difficulty of the current year compared to the previous three-year period. With very little exception, respondents reported that this year has been worse to date (June 2006) than previous years.

The reasons for the increasing difficulties were cited as follows: the drought early in the year has led to a shortened growing time for crops and a poor harvest for many. The drought also led to the

outbreak of army worms that infested crops across the valley and destroyed crops, or meant that crops had to be replanted.

The most difficult time of year for respondents was consistently January to April, particularly the February and March. During this time, people consistently run out of food; their harvests are finished, they have great difficulty meeting their household needs. As a response, many abandon their smallholdings and go and work on the farms of wealthier neighbours for a piecemeal wage. Many of those working near KVTC estates work there. Others borrow money. Others sell livestock, or forage for and sell forest products, including firewood and charcoal. Utilisation of neighbouring forests increases during those times to the extent that some respondents, particularly women, reported relying on the forest for their nutritional needs during food shortages, foraging for mushrooms, roots and fruits. To some extent, the government and NGOs are supportive in difficult years, but the reality that forest utilisation increases during times of vulnerability is of particular note.

5.2 Shocks

Alongside the shock of drought and pests, other aspects which can bring sudden shocks to community livelihoods in this area are HIV AIDS, severe flooding, accidents and other illness. As a rule, respondents state they have little means of being able to anticipate shocks, and simply have to accept them and deal with them as they come. In times of hunger, they rely on other employment, debt and aid. To combat the spread of AIDS seminars are held, but their view is that little is changing in terms of human behaviour, to prevent the spread of the disease. In terms of being prepared for the shock of drought or flooding, there are insufficient stores of food crops to tide people through unexpected difficulties – caused because a large percentage of what is grown having to be sold for basic needs, and because of low levels of production and yield per smallholding.

5.3 Key Problems

There are a range of problems which restrict development in these communities. For each village, these problems were prioritised. Overall, they are ranked below, with the first listed being the most limiting for communities:

1. Insufficient access to clean water
2. Lack of well equipped, affordable dispensary, with qualified medical staff
3. Lack of teachers housing
4. Lack of proper educational infrastructure; poor primary schools, lack of secondary schools
5. Lack of access to markets/lack of transport
6. Lack of land
7. Lack of farm inputs to increase efficiency of production and yield
8. Lack of electricity
9. Lack of telecommunications

6 Influential Institutions

Assessments included gaining an understanding of the institutions who 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 an real impact on a particular community. It is notable that the institutions with the greatest *economic* influence (typically as donors) on village life were seen as most influential.

In villages near UMNP, notably those near Nyanganje, Iwonde and Ihanga forest reserves, respondents rated TANAPA as an influential institution, but as the study of villages went west and

south away from the park, towards Matundu forest, the Idete corridor and Udzungwa Scarp, awareness of TANAPA as an influential organisation declined considerably.

Overall, Plan International is considered the most influential institution, particularly, but not exclusively for the villages south of the 'Idete corridor' forests. Plan International have gained this level of awareness because of the significant role they have played in village development projects, particularly in building schools, dispensaries, latrines and market places and in supplying books and uniforms.

Kilombero Valley Teak Company (KVTC) is also a key institution in 'Idete corridor' area, they pay into a social fund in Namwawala. Both prisons in the area where also seen as influential, as is the JKT army base in Ikule. TANESCO is considered influential in the few villages where the company pay a maintenance fee for passing a line through the village. Religious civil society institutions (churches, mosques) were also considered influential but to a lesser degree. Civil Society support organisations like Cobasheka, Cotaco, Solidarmed, CEFA, LKEMP and Daipesa have varying influence on an individual village basis, as does TASAF.

Notably, village government, district councils and central government are not generally seen as influential institutions. Further, despite the initialised/ongoing process of PFM in the vast majority[1] of the sample villages, it was barely referred to. The nearest association most respondents came to with regards to the PFM process in their villages was in stating that they had set up village natural resource committees in recent times.

7 Attitudes Towards Forest Conservation

For the penultimate part of each discussion a series of open questions were presented relating to knowledge of the forest, rules and regulations relating to the forest, activities permitted or not, costs and benefits of the forests and views towards conservation of the forest environment.

7.1 Decline of Forest Cover

Respondents across the valley survey area reported an overall decline in forest cover in their memory. However, a minority reported that the period of decline was now over and in recent years the forests local to their villages were beginning to recover.

Specifically, the response per village is given below. There is not a clear picture as neighbouring villages, such as Chita and Udagaji or Idete and Namwawala give contradicting answers.

Table 34: Perception of Declining or Increasing Forest Cover

Forest Reserves/Area	Selected Villages	Forests Perceived to be Reduced?
Nyanganje	**Signali**	**Reduced**
	Kiberege	**Reduced**
Iwonde/Ihanga	**Ihanga**	**Reduced**
	Machipi	**Reduced**
	Kilama	Increased
Iyondo/Matundu	**Igima**	**Reduced**
	Mpofu	**Reduced**
	Mngeta	**Reduced**
	Njage	Increased
"Idete Corridor"	**Idete**	**Reduced**

[1] [1] According to sources in Kilombero District Council and FBD, 13 out of 15 of the study villages are at different stages of PFM, namely, Signali, Kiberege, Kilama, Ihanga, Machipi, Mpofu, Mngeta, Njage, Idete, Namwawala, Mkangawalo, Ikule and Chita. All of these are under JFM and two (Kiberege and Mkangawalo) are under both JFM and CBFM. The majority of PFM activities for these viallges are being funded by the Danish, Norwegian or Irish Governments.

Forest Reserves/Area	Selected Villages	Forests Perceived to be Reduced?
	Namwawala	Increased
	Mkangawalo	**Reduced**
	Ikule	Increased
	Chita	**Reduced**
Udzungwa Scarp	Udagaji	Increased

The main reasons cited for deforestation are: charcoal burning, tree cutting, increased usage of timber, fuelwood and forest products for building, cooking and furniture. Population growth in the area is cited as a root cause, particularly related to increasing shifting cultivation. Fire is seen as a major threat to the forests. Grazing is also said to be causing deforestation although this is likely to reduce, according to respondents, as most pastoralist groups are being told to leave Kilimbero valley.

Respondents claim to be able to counter deforestation by using fuel-efficient stoves, by planting trees in set-aside areas, by increasing environmental education, by taking firewood from their farms rather than the forest, by setting up and managing village environmental committees, by patrolling the forest, by fire suppression, and by maintaining a view of the forest as sacred/taboo as the ancestors did.

7.2 Regulations Governing Forest Utilisation

The majority of community members across 15 villages stated that they knew the regulations governing the forest reserves. These are given below, **from their perspective,** set into permitted and non-permitted activities regarding utilisation or otherwise of the forest reserves under study. Significantly, the understanding of regulations varies quite considerably from village to village.

Table 35: Permitted and forbidden forest activities

Forest Reserves/Area	Selected Villages	Permitted Actvities	Forbidden Activities
Nyanganje	Signali	Beekeeping, Deadwood Collection	Live wood collection, cutting down trees, farming on river banks
	Kiberege	Deadwood Collection, Live wood Collection, Extraction of medicinal plants	Cutting Trees, Disturbing water sources, Burning, Poaching
Iwonde/Ihanga	Ihanga	Beekeeping, Deadwood Collection, Live wood Collection, Shifting cultivation, Timber extraction	Cutting Trees, Burning, Poaching, Charcoal Making
	Machipi	Beekeeping, Deadwood Collection, Live wood Collection, Grass collection	Cutting Trees, Burning, Hunting, Poaching
	Kilama	"No human activities allowed"	Timber extraction, Cutting Trees, Charcoal Making
Iyondo/Matundu	Igima	"The forest is restricted from human activities but illegal activity goes on"	Timber extraction, Cutting Trees, Disturbing water sources, shifting cultivation, Burning, Hunting, Poaching, Charcoal Making
	Mpofu	Beekeeping, Deadwood Collection, Live wood Collection, Mushroom Collection, Extraction of medicinal plants, Ritual Activities	Timber extraction, Live wood Collection, Cutting Trees, Burning, Poaching, Charcoal Making
	Mngeta	"The forest is restricted from human activities but there are plans to develop regulation allowing utilisation"	Timber extraction, Cutting Trees, Disturbing water sources, shifting cultivation, Burning, Hunting, Poaching, Charcoal Making
	Njage	Mushroom Collection, Extraction of medicinal plants	Timber extraction, Cutting Trees, Disturbing water sources, shifting cultivation, Burning, Hunting, Poaching, Charcoal Making
"Idete Corridor"	Idete	Beekeeping, Timber extraction	Cutting Trees, Disturbing water sources, Burning, Hunting, Poaching, Illegal fishing
	Namwawala	"No human activities allowed"	Timber extraction, Cutting Trees, Disturbing water sources, shifting cultivation, Burning, Hunting, Poaching, Charcoal Making
Udzungwa Scarp	Mkangawalo	Deadwood Collection, Live wood Collection, Extraction of medicinal plants	Timber extraction, Cutting Trees, Disturbing water sources, shifting cultivation, Burning, Hunting, Poaching, Charcoal Making

Forest Reserves/Area	Selected Villages	Permitted Actvities	Forbidden Activities
	Ikule	Beekeeping, Deadwood Collection,, Extraction of medicinal plants, Grass collection	Cutting Trees, Disturbing water sources, Burning
	Chita	Beekeeping, Deadwood Collection	Cutting Trees, Poaching, Charcoal Making
	Udagaji	Byelaws in place. Beekeeping, Deadwood Collection twice a week, Mushroom Collection, Ritual activities	Timber extraction, Cutting Trees, Disturbing water sources, shifting cultivation, Burning, Hunting, Poaching, Charcoal Making

7.3 Costs and benefits of the forests

The benefits of the forest usually focused on by respondents are those wood and non wood forest products discussed above, and the ability to access and utilise them, as well as positive effects on the climate and consistent water supply as discussed.

When many of those benefits are restricted to communities, this is often seen as a cost. To some , this is an acceptable cost in order to guarantee the conservation of the forest. To others, the benefits need to be shared amongst the communities surrounding the forest are to respect and value the forest.

Further, many respondents state that whilst often being unable to share many of the benefits of the forest they still have to bear the costs. Specifically, they have to cope with human-wildlife conflict. In particular, baboons and bush pigs are seen as consistent pests. Because village communities are not allowed to control wildlife populations themselves, they have no recourse except to make sure they have people on their farms to chase away wildlife as and when they enter farms from the forests.

7.4 Roles and responsibilities

The majority of respondents, male and female, recognise the role they have to play as guardians of the forest, particularly through their roles in environmental management committees, including playing a part in patrolling the forest and in putting out wild fires. Tree planting is seen as an important activity in conserving the forest, although to a large degree this is paid more lip service than actually carried out, unless there is intervention from an external institution (NGO or government) as has been the case

7.5 Tourism attractions and activities

Tourism is seen as a welcome economic activity if it is to come about. There is a perception across the sample villages that tourism will bring considerable economic development through foreign exchange receipts. However there is a marked lack of awareness about what market, infrastructural and service-related factors will allow for successful tourism. Many respondents understand that wildlife attracts tourism, as does the natural beauty of the forest, waterfalls and hot springs, as well as sacred cultural sites, but they are unaware of the difficulties that the relatively isolated location of the Kilombero valley and western Udzungwa range would provide for the logistical realities of encouraging tourism. There were no respondents with any experience in working in the tourism sector, although respondents living adjacent to Udzungwa Scarp Forest Reserve have been made aware of the benefits of tourism by CEFA.

7.6 Level of environmental education

Most villages have benefited from some form of environmental education from external institutions. Largely, this has come about through the creation of village environmental committees. However, when asked in discussion groups how many people have had environmental education, respondents indicate that it is the committee members who have had environmental education, such as through workshops, but that the majority have not.

While it is accepted amongst respondents that it is the responsibility of committee members to share the knowledge they have gained, many state that such knowledge is not being shared, due in part because the individual committee member may be unwilling to impart their knowledge for fear of losing their special status as a village specialist in these areas. The implications of this finding is that a lack of governance coupled with the interference of local political interests on a community level is considerably restricting the effect of environmental education. Typically, respondents would welcome greater environmental education to enhance their ability to understand and manage the forest.

7.7 Future Forest Management

A final theoretical question was asked of each group: "*If*, as a community, you were able to make decisions about how the forest should be managed in future, under what regime should the forest be managed?" The following answers were given.

Table 36: Future Forest Management – Community Suggestions

Forest Reserves/Area	Selected Villages	Future Forest Management Suggestions
Nyanganje	Signali	Forest should not be annexed by TANAPA as the community rely on the resources; Community should have controlled utilisation
	Kiberege	Forest should not be annexed by TANAPA as the community rely on the resources; Community should have controlled utilisation
Iwonde/Ihanga	Ihanga	The community understand the beauty and value of the forest and propose JFM between government and community
	Machipi	The forest should be managed by the village government with restricted utilisation following a process of management training and awareness
	Kilama	The forest should be monitored and administered by village government set aside into utilisation and protected zones
Iyondo/Matundu	Igima	The current forest management system is good but requires greater environmental education and management by local people
	Mpofu	The forest should be managed by the village government with restricted utilisation following a process of management training and awareness
	Mngeta	The forest should be managed by the village government with different zones for utilisation and protection following a process of management training and awareness
	Njage	The forest should be managed by village government in collaboration with central government for technical inputs and patrolling
"Idete Corridor"	Idete	The forest should be managed by the village government with restricted utilisation following a process of management training and awareness, and patrolled by the FBD or TANAPA with village agreement
	Namwawala	The forest management should be under either TANAPA or the district council but there should be a management zone where utilisation is permitted
Udzungwa Scarp	Mkangawalo	TANAPA should manage the forest as it is suffering for fires and over-utilisation. However, there should be a management zone for community utilisation, managed in partnership

Forest Reserves/Area	Selected Villages	Future Forest Management Suggestions
	Ikule	The forest should be under village government in collaboration with TANAPA and support from NGOs, with increased environmental education
	Chita	Management should involve the community in some form but the first step should be environmental education. TANAPA would be welcome to fulfil that initial role
	Udagaji	Management by TANAPA alone restricts communities and leads to criminality, therefore TANAPA should provide forest management training leading to forest management in partnership

To summarise the views of the village discussions on future forest management, the findings are summarised by forest reserve/area.

Njanganje Communities cautious of TANAPA because of apparent heavy handedness and their policy of non-consumptive utilisation. Would prefer controlled utilisation with greater individual village control of forest.

Iwonde/Ihanga Communities would favour local management, or joint management, with management zones, and the support of an environmental management and awareness programme to give them the capacity to manage effectively

Iyondo/Matundu Communities would favour local management, with management zones, and the support of an environmental management and awareness programme to give them the capacity to manage effectively

'Idete Corridor' Communities would favour local management, but do not object to partnership with FBD or TANAPA, provided there are utilisation zones

Udzungwa Scarp Communities would support management by TANAPA providing they are given environmental education leading to a form collaborative management involving communities

Findings from Stakeholder Consultations[2]

1 Government Natural Resource Managers

Interviews were held with key stakeholders from district, regional and central government offices to gather insight on the current management realities of and perceptions towards the management of the forest areas under study.

1.1 Kilombero District Council, Ifakara

An interview was held in Kilombero District Council Forest Office, with George Mbega, Mwaijele Elias, Lukelo Matimbwi and, Kijayo Saidi. PFM and forest management in general were discussed. The process has been in place since 1998 (implementation started in 2000) for NORAD funded villages, and since 2002 for DANIDA funded villages (implementation started in 2004), but progress has been slow.

Development of JFM

The catchment forests under question are watershed management areas and are therefore any degradation of them puts the country's water supply at high risk of depletion or loss of quality. Therefore JFM has been chosen as the proposed strategy for managing the forest reserves, allowing for continued district or central government management and intervention. CBFM is not seen as appropriate for catchment forests, with higher risks of deforestation perceived. Kilombero District Council oversees six JFM partnerships with villages, the remaining villages in the region under the JFM process are partnered with central government (FBD) or other districts. Plan International have been supporting the council with the implementation of JFM activites according to discussions with both the district council and Plan.

The remaining part of Nyanganje Forest Reserve (25% of the original reserve) that did not fall under UMNP is coming under a JFM agreement between the FBD and villages. Ihanga Forest Reserve, under JFM with Kilombero District Council, has been problematic, with squatter farmers occupying the land to date. Iwonde forest reserve is in a better state, as it is protected on all sides by surrounding forests. A large percentage of the former Iwonde forest reserve is now part of UMNP. Matundu forest reserve benefits from its boundary with one of KVTC's plantations.

The corridor area between Matundu and Udzungwa Scarp forest reserves that is reported to be facing considerable destruction. The discussion assessed the potential of creating village land forest reserves for the corridor, to be managed through CBFM involving the communities living in those areas. According to the district, CBFM processes have begun in several corridor villages including Mkangawalo and Mngeta, however, they are very much at the early stage.

Problem of Shifting Cultivation

Shifting cultivation is held up to blame for much of the deforestation across the range, particularly in the corridor area. The motivation for an individual to take agricultural land in this manner is high – no weeding or farm inputs are required for the first two years, after which the farmer is likely to clear another area of forest and start the process again, leaving the cleared area to revert to secondary growth. Grazing is also seen as a cause of deforestation in the are, although this is expected to reduce considerably after the ban on grazing outside homesteads after 30th June 2006 takes effect.

[2] It should be noted that while the analysis given attempts to give the perspectives of stakeholders, as it is a non-verbatim summary it may not represent the precise opinions of individuals. Any misinterpretation of viewpoints is unintentional.

Future Livelihood Activities

Beekeeping, agroforestry, the development of woodlots (with exotic and indigenous species) and the development of village forest reserves under CBFM are all seen as being key to sustainable utilisation of village forest areas in the future. Alternative livelihood activities are also proposed, incorporating selling modern charcoal from woodlots, vegetables, mushrooms and the development of fish ponds near rivers for sale to local markets. Fuel-efficient stoves will be increasing important.

There is apparently good cooperation between the District Forest Officer and District Catchment Forest Officer and TANAPA, working together on monitoring and evaluation assessments. However, TANAPA management of forests areas is said to benefit the community but not the individuals. There is said to be scope for greater development of the relationship between TANAPA, the FBD and District Offices.

1.2 TANAPA – Udzungwa Mountains National Park

An interview was held with TANAPA in UMNP headquarters, Mang'ula, with representatives from the management team, including Ecology, Works and Community Conservation Services. Christopher Timbuka, Simon Naivasha, Simon Aweda, Erasmus Kimaryo, Paul Banga, Flex Malisa and Abel Mtui were present.

It was suggested that for TANAPA to be able to annex any given area they would require full support from the local communities, especially as protected areas under TANAPA cannot support consumptive utilisation. The group noted that, as a whole, TANAPA does not have local support for annexation in the Udzungwa area. Although it is accepted that the broad community perspective is for the forests under study to be managed by the communities themselves, practically it is viewed as impossible because there are a lack of resources, both financial and human, to manage such large areas. This is coupled with the difficulties in implementing PFM, a process which requires considerable commitment from all parties. The meeting made the assessment that if capacity to manage the forests is given solely to the communities, the forest is likely to become degraded. If there is to be community management of a given area, it should be done so under supervision from an external party, such as TANAPA or the FBD.

Nature Reserves

One option suggested for the forest reserves under study would be to upgrade them to nature reserves, the highest level of protection under FBD control. This option was suggested because catchment forest status indicates that the forests should be protected rather than utilised, and would raise national and international awareness as to the importance and value of conserving these forests. However, this option is also likely to cause problems with village communities. As with a TANAPA-managed forest, the governing policy for nature reserves also prohibits human access to forest resources, which is likely cause conflict as long as communities do not have alternative sources of energy.

Education, Energy and Patrolling

It was suggested that a better option would be to continue with the current management regime for the current time period and first develop an environmental education programme, provide alternative livelihood options and income generating activities. Further, that there should be formation of groups of village guards, supplemented with some incentives, to patrol the forest and protect the forest resources. In addition, that deadwood collection be managed to a prescribed timetable. However, raising environmental awareness is not a simple process; it may take three years or more. Provision of alternative energy sources will take longer still. The experience of UMNP to the east and immediately south of the park is seen as testament to these difficulties.

TANAPA state that they would generally be willing to annex an area if the initial plans start from the community, otherwise there should be willingness from FBD to continue to develop the management of these forest reserves.

1.3 Rufiji Basin Water Office, Iringa

An interview was held with Willie Mwaruvanda, Basin Water Office. He informed the consultant that within the Rujiji water basin are four large river systems (Great Ruaha, Kilombero, Luwegu, Rufiji) and the Udzungwa Mountains feed 80% of its waters into the Kilombero river and 20% into the Great Ruaha.

The discussion centred around the importance of the Udzungwa Mountains as a water catchment. The region, and broader nation rely on water from the mountains such as for irrigation systems for plantation agriculture, for smallholder livelihoods, and, crucially, for hydroelectric power. Approximately 30% of Tanzania's total energy supply comes from hydroelectricity produced at Kihansi and Kidatu dams.

However, socio-economic realities dictate that limited utilisation by communities living near the forests is necessary to meet their energy needs: even if forest-adjacent villages were energised with electricity it is unlikely that they could afford it, because of the high cost of power in Tanzania.

The water office is therefore encouraging communities to develop their own woodlots through collaboration with district and regional government forest offices. However, this is difficult to encourage on a village level because the benefits are not immediate, because farmers prefer to prioritise land for farming and because when communities see forest next to their farms it is difficult to see a case for tree planting.

Catchment forests are threatened by wild fires, often linked to shifting cultivation as farmers clear using fire. Some people are said to like fires, these boast of their prowess if they have seen a forest fire they have started spread over a great distance. Environmental education is required to address this mentality.

Tanzania's forests have dwindled considerably leaving only catchment forests in some areas. These will have to be carefully managed not to suffer the same fate. There is a need therefore to limit catchment forests to only minimal utilisation. If the hydrology is changed, particularly by cutting trees, it is likely to lead to increased, faster run-off, loss of water quality, flooding, frequent floods, limited dry season flows, and the loss of wetlands such as the Kibasira Swamp, a Ramsar Convention site. Further effects would be soil erosion, sedimentation of dams and rivers, the spread of pollutants and disease and the death of wildlife.

1.4 Regional Catchment Forest Office, Iringa Region

A short interview was held with John Massao. At the time of writing, the FBD is currently in the process of converting West Kilombero Scarp, part of Iyondo, and the remainder of Matundu (not part of UMNP) forest reserves to the higher protective status of nature reserve. This area will be likely called **'Kilombero Nature Reserve'** once the process is complete, an area just under 140,000 hectares.

A nature reserve has its own separate regulation, giving it the potential for more autonomy than a normal forest reserve. A nature reserve can set up revenue sharing systems more easily than within a normal forest reserve. However, the main benefit of this form of awareness will be to raise the conservation value of the area and be able to identify it as a protected area internationally.

Nature reserves are typically non-utilisation, but they are relatively new to Tanzania. JFM can be developed for forests set aside for either utilisation or non-utilisation.

1.5 Regional Catchment Forest Office, Morogoro Region

A brief interview was held with Mr. Mialla. PFM incorporates an increasing recognition that people need to be involved in management and benefit sharing. There is currently a proposal to link several of the mentioned forest areas into nature reserves and increase connectivity between them.

Key to the forest conservation and sustainable utilisation will be awareness and environmental education. There is still a long way to go in developing a community level understanding of forest management.

1.6 Forest and Beekeeping Division, Dar es Salaam

An interview was held with Patrick Akitanda, Assistant Director, first. The FBD is going through a period of change. **Tanzania Forest Services (TFS)**, a forest management agency, is apparently close to being set up, which will take on many of the current forest management activities of the FBD.

Tanzania Forest Services

Under TFS, the PFM process will alter slightly, and is expected to become more efficient. District Forest Officers will continue to manage local authority reserves but not national reserves. This will be under TFS. Each forest reserve will have its own in-situ manager. Licensing will be carried out by TFS. The principle is to increase the efficiency of forest management activities by by-passing district processes. The TFS will be able to fund itself through its commercial plantations, mostly teak.

Under TFS, forest management will continue to fall into three categories:

Core Management	Direct Government, or JFM: Government, NGOs and communities
CBFM	Village Forest Areas
Concessions	Management and harvesting, indigenous and exotics

Concessions will be given out for productive forests but not for protected forests such as catchment forests.

Catchment forest will continue to be under total protection, with only the following activities allowed: research, ecotourism, collection of deadwood, collection of natural medicines, beekeeping with modern hives, margarine production.

Community members will not be able to become rangers solely because they are from the area, they would have to respond to advertisements in the national media and apply for particular positions.

According to discussions within the FBD, the expansion of Kilimanjaro National Park by TANAPA by annexing Kilimanjaro catchment forests is not seen as successful to date, although they are hopeful there may be better results as it is early days. A fear amongst certain foresters is that much of the work carried in educating forest-adjacent communities to the importance of the Kilimanjaro forests will be undone by the inability of communities to access areas now under TANAPA . It is therefore clear that there is a perceived difficulty in understanding how such a model could apply successfully to the remaining Udzungwa mountains forests not already part of UMNP. Future lessons from Kilimanjaro and Arusha/Meru should be carefully assessed when assessing the possible expansion of UMNP.

Community Must Benefit

An interview was held with Aloys Tango, Acting Director. The government should decide what is the best form of management for catchment forests such as the Udzungwa mountains, whether that be TANAPA or FBD. However, FBD are likely to have the greater experience because they are foresters rather than wildlife managers. From a human resource perspective, the FBD would be the better option. From a financial resources perspective, TANAPA would be in a stronger position.

Communities need to benefit from forests. If they benefit, they will look after the resource. If they do not benefit, there may be conflict. However, village natural resource committees have insufficient skills and knowledge to be able to manage forests effectively. Assisting communities with schools and hospitals and public services is a support, but does not provide individual benefits and is just subsidising a government responsibility. Individuals need to benefit financially.

1.7 Wildlife Division, Dar es Salaam

An interview was held with Kayera Juma. With the exception of the discussion related to Magombera Forest Reserve bordering the Selous Game Reserve which the WD indicated it would be interested in annexing as part of the Selous GR (not discussed here), the forests reserves under study in the Udzungwa Mountains fall under FBD and WD has no further input.

2 Commercial Stakeholders

2.1 Kilombero Valley Teak Company

An interview was held with Roland Freyer, Technical Manager and Felix Mkonyi, Conservation Manager. 50% of their plantations are given over to indigenous tree forest management, the remaining to teak. Teak is highly specialised and difficult to grow without the right conditions. This means it is unlikely to become a pest but also is difficult to grow on a smallholder level.

KVTC has a conservation component and a social component with strict guidelines and activities for each. 9 local villages are involved in a social fund which they receive in return for protecting and patrolling the plantation boundaries. The company supports local social services in different forms.

Some community individuals have some understanding of forest management and the benefits of the forest if managed sustainably, but for many, a great deal of environmental awareness will be required before communities can become effective forest managers.

Communities are also being assisted with modern hives for beekeeping which is believed to have great potential, especially because of the enhanced technology of modern hives yields significantly higher qualities of good quality honey and does not require smoking out or killing the bees.

2.2 TANESCO – Kihansi Plant

An interview was held with Sylvester Mgina, Acting Plant Manager. TANESCO are involved in supporting environmental conservation and communities in the Udzungwas. There are regular discussions held with the 9 villages TANESCO is working with. TANESCO have supported LKEMP, below, having supported previous environmental management projects prior to LKEMP. TANESCO have carried out tree planting activities in 6 villages, including Udagaji.

There is an Environmental Management Programme involving the government, communities and TANESCO in ensuring TANESCO and community activities do not have a negative impact on the catchment forests, particularly in maintaining water levels and quality.

3 NGO Stakeholders

3.1 Lower Kihansi Environmental Management Project, Mlimbi

An interview was held with Devolent Mtui. LKEMP's main focus is on the conservation of the Lower Kihansi Gorge and to monitor it s biodiversity, less so on community development. In June 2006 the project ended and came under co management of TAWIRI and the Wildlife Division, because of the endangered Kihansi toad. LKEMP have supported local communities in grants and in a tree planting programme, however the latter has not been particularly successful due to lack of funds. The gorge needs to continue to be under some form of protected status.

3.2 Plan International, Ifakara

An interview was held with Ayoub Kapona, Community Development Facilitator. Plan collaborate with the Kilombero District Council through the use of manpower and expertise to facilitate natural resources management activities such as beekeeping and tree planting. Plan's core water and

environmental sanitation programme deals with environmental issues such as tree planting, awareness raising on the importance of forest conservation and facilitating the PFM programme with the District Government. Also in water conservation and in the use of improved stoves.

Plan recognises that forests are the source of considerable natural wealth therefore they have obligations to involve the community to understand that forests need to be conserved but also that the community should benefit from sustainable activities such as beekeeping.

Plan view the communities in the valley as likely to continue to be able to be self supporting as long as they are engaged in farming activities, and as long as the valley remains fertile and productive for agriculture. Their understanding is that the communities are not particularly dependent on the forest reserves as their core activities (e.g. agriculture) do not rely on forest consumption (as long as no further forest area is cleared for cultivation).

However, because of shifting cultivation, especially for maize which suits the higher terrain of the forested areas, deforestation continues to occur, to the extent that clearing forest for maize is more pronounced than forest clearance for charcoal.

Plan will potentially be a useful partner with a conservation organisation like WWF because of their experience in social programmes in the area under study as well as PFM implementation.

Discussion & Recommendations

1 Future Forest Management Regimes

There are three broadly feasible management regimes to consider. These are outlined below[3]. One of these is the current regime of catchment forest reserves mostly under joint forest management, and is proving insufficient as it stands. Two options, management under TANAPA or the establishment of two nature reserves (potentially incorporating the Idete Corridor), are broadly feasible under the right conditions and with measures to counter negative aspects. In order to succeed in the long term, each type of management regime would need to be implemented taking into account the realities and aspirations of the communities (as identified in this study).

1.1 Continued Management of Catchment Forest Reserves under PFM

For Catchment Forest Reserves (CFRs), only JFM is commonly seen as appropriate rather than CBFM because of the ecological importance of the area. Only village forest lands bordering forest reserves and the corridor area are appropriate for CBFM within the current classification. If JFM is to be developed further, a cautious process of limiting community influence over management will be necessary for the reserves, particularly whilst forest management skills and environmental awareness levels remain at a basic level within communities.

CFRs are of similarly high conservation status to national parks and in theory allow only non-consumptive forest usage which offers little benefit to communities (in practice there is consumptive use as the research shows). PFM within these frameworks therefore imposes substantial obligations on communities whilst offering little benefit. Substantial positive community engagement in conservation is therefore unlikely in the long term. It is also noteworthy that communities feel little real sense of ownership under JFM as ownership is seen as remaining with the government.

A further limiting factor is the lack of donor funding for CFRs, because they lack internationally recognised protected area status. The funding process is also seen to be cumbersome, from government to implementing body, to implementation.

PFM is, by nature, a 'participatory' approach and if this option is to be developed effectively increased effort is recommended to develop awareness of the benefits available to communities under JFM and to ensure that certain benefits, however limited, materialise for communities. If the community are able to realise greater benefits from the forests, they are likely to be more inclined to feel ownership of the forests and become better managers and guardians. Thus, increased effort to develop the capacity of communities as custodians of the forests is necessary, as there is no other form of patrolling mechanism under FBD management. Further, the communities adjacent to the forest are likely to be the first to consciously degrade the forest if they sense the costs of the forest outweigh the benefits.

There is pressure to change the status quo from those who favour extension of the national park or creation of nature reserves. Even within FBD, there is a growing sense, that nature reserves would be a better option on conservation grounds than continuing with the status quo.

1.2 Management under TANAPA

It is possible that Udzungwa Mountains National Park could be extended southwards and westwards to incorporate some or all of the forest reserves (and potentially the Idete corridor).

[3] A fourth option of a purely community-based management regime (such as CBFM across the area) is unfeasible given the conservation imperative, the time and money required to implement it and the reality of communities preferences and behaviours.

Alternatively/additionally, the Udzungwa Scarp Forest Reserve could become an additional National Park incorporating the Idete corridor. These options are supported by TANAPA's history successful natural resource management, with well trained, well paid professional staff and an emphasis on resource management.

However, TANAPA lacks the support of the majority of communities for a potential expansion of the park to the immediate south and west of UMNP which would make annexation of that area difficult (although more support is found in the Udzungwa Scarp area). This could be overcome through extensive community liaison end environmental education to build trust between communities and TANAPA.

Where TANAPA has more general support is in respect of its technical ability to manage and patrol protected areas and bring tourism to an area. In the area under study, TANAPA has greatest support as an organisation in an area where it is relatively unknown, Udzungwa Scarp Forest Reserve. Potentially this might lead it to taking on management of Udzungwa Scarp as a new national park, although this would of course require considerable discussion and may be unfeasible from a financial point, as well as the relative isolation of the reserve. Further, it is difficult to assess how TANAPA would be able to take on the management of an area currently under FBD control without a clear acceptance that TANAPA would be better managers. With the current degree of consumptive utilisation by communities of the forest, TANAPA's policy of non-consumptive utilisation is likely to bring about conflicts of interest if it were to annex any of the forest areas under study at this stage.

TANAPA offers 'enforcement' to protect the national park area and is seen as taking a hard line on this (which FBP is unable to offer). However, as TANAPA has relatively few staff to cover the extensive forest area, it is impossible to police this effectively. Thus, a cooperative approach is needed to ensure security of forest resources. In order to get this cooperation, the communities must see the benefits to themselves.

1.3 Management under FBD as Nature Reserves

Nature Reserves is a new classification under FBD, and only one nature reserve, Amani, has been established to date. Nature reserves are designated to maintain natural processes and habitats in an undisturbed state for scientific study, environmental monitoring and non-consumptive utilisation and would therefore be appropriate to an area of high ecological importance as the Udzungwa mountains. Significantly, as nature reserves are recognized as ranking the highest conservation status in Tanzania, their establishment in this area would lead to their recognition under the IUCN system of protected areas.

Perhaps the most salient socio-economic issue with upgrading forest reserves to nature reserves would be the level of utilisation by communities that would be allowed. In theory, their status is as highly protected, if not higher, than national parks and would therefore restrict utilisation by communities to a greater extent – only non-consumptive utilisation would be allowed. As with a national park area, this may lead to conflict with forest-adjacent communities and non-compliance of these communities.

In order for Nature Reserve status to be accepted locally and ultimately to conserve the forests, the areas would need enforcement as access would be illegal (difficult in such extensive areas). Alternatively highly positive relationships with communities would need to be developed through education, community relations, and provision of tangible benefits (beyond what they would ordinarily expect from the government as their right).

However, potentially, as a relatively new form of protected area management for Tanzania, the level of community management and utilisation allowed is still open to debate, especially as JFM activities can continue under nature reserve status.

1.4 Managing 'Idete Corridor' Forests

Given its location between the Udzungwa Scarp Forest Reserve and either the current Matundu Forest Reserve or the proposed Kilombero Nature Reserve, a considered solution to developing connectivity

between these forests is to bring the corridor under either of the nature reserves. However it may be more practical, given the impact of the human population in this area, and the lack of a forest reserve to offer an outline structure for management, that the area be turned into a series of village forest reserves under CBFM.

According to the community in the Idete wildlife corridor area, the forest should be managed by the village government with restricted utilisation following a process of management training and awareness, and patrolled by the FBD or TANAPA with village agreement, as long as there is a management zone where utilisation is permitted. If either a TANAPA or FBD management offer some form of utilisation and benefit-sharing opportunities, they will be able to successfully take over management of the corridor forests with general community support.

2 Livelihood Issues

2.1 Forest Dependent Communities

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 an 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.

Communities are, to some degree, aware of their rights as land managers, even if they have not yet been taken through the land use planning process as a whole. Consequently, they are resistant to policing or any attempt to cut themselves off from the forest. Given the sense of a right to management of the forest by communities and the reliance to a lesser or greater degree on the forests, there is need for be greater efforts to be made in offering alternatives to reduce forest dependence whilst still offering benefits.

2.2 Lack of a Homogenous Community

That such a large and growing percentage of the population are migrants (70.3%) is highly significant to this study on a number of levels.

1. It illustrates that the ‘community’ is not homogenous, being made up of people throughout the country, and implies that the majority migrant population do not have a historical claim to the area, only a recent one
2. It suggests that whilst the catchment forests may have been well conserved in the past, that the influx of people without a historical connection to the land is likely to lead to a reduced interest in conserving the area
3. Linked to the above, it suggests that practice of ceremonial activities and existence of taboos which support the conservation of the forest by restricting peoples access through respect and fear of reprisal is significantly reduced. The numbers of local-born residents with a socio-cultural relationship with the forest is decreasing as far fewer young people have such a spiritual connection with the forests.

2.3 Lack of Environmental Training and Awareness

Whichever forest management regime is developed for a given area, whether a community management aspect is agreed, or whether communities are required to become better custodians of the forest, a continued programme of environmental education and awareness raising will be essential.

Education levels amongst the majority of the communities under study are typically of primary school level, seldom higher. Therefore, any education campaign needs to take into account the levels of knowledge and skills required to clearly present the complex issues around forest management, maintaining levels of biodiversity, conserving existing ecologies and hydrology. The current level of awareness regarding forest conservation is generally limited to basic understanding for many as the majority of community members are farmers by chosen livelihood activity rather than foresters.

Where it is expected that communities, or representatives of communities, are to become forest managers, part of patrol teams, or committee members responsible for giving environmental education themselves, it is reasonable to expect that training will be required by experienced technical staff via government or NGOs. Clear targets should be set to make forest-adjacent communities aware of the benefits and values of the forest, as well as management techniques.

3 Potential Economic Activities

3.1 Alternative Energy

It is recommended that alternative sources of energy continue to be researched and developed for the communities in question. The greatest link of dependence on forests is on the use of fuelwood. If there is no energy alternative to the forest, it would be untenable to cut communities off from current sources. There is a need to continue to develop alternatives to fuelwood, such as energy efficient stoves and renewable energy technologies. Research that has been carried out recently by WWF in the east of UMNP may be a useful starting point.

3.2 Community Woodlots

Another area to continue to focus development on is on community developed woodlots. These, if managed properly, can allow for a local harvest of timber and forest products including for fuel, building and medicines. However, it should be noted that unless strong support can be given in setting up woodlots and developing tree planting programmes that will offer market benefits to communities they are unlikely to be developed at any rate. Further, there is a considerable lag time for woodlots to grow to harvestable sizes. Land availability, and the prioritisation of land for agriculture will also make woodlots difficult to develop on a large scale.

3.3 Alternative Income Generation Activities

Alternative income generating activities (AIGs) may be able to provide opportunities to diversify incomes away from activities which rely on taking value from forest products. It is recommended that research be carried out to identify and propose AIG interventions that will be at once realistic to meeting community aspirations and abilities but also sustainable from a forest conservation viewpoint. Such activities may involve utilising forest products if they are ecologically sustainable. Such research should focus on identifying socio-economic and market conditions, and existing financial facilities, to developing linkages between buyers, sellers and financial services and to make financial institutions more accessible to communities with the aim of making future income generating activities economically sustainable, and ultimately, profitable. However, it should be noted that although AIGs benefit communities, they do not always remove pressure on ecological resources because they are seen as additional activities rather than replacing existing practices and great care must be taken to ensure that any AIGs taken forward do lead to reduction of destructive activities.

3.4 Agricultural Intensification

As the high level of migrancy to the area testifies, Kilombero valley is highly attractive to many rural Tanzanians because of the high agricultural potential that the area, supported by the microclimate afforded by the Udzungwa mountains forest. As the livelihood assessments indicate, the community in this area are smallholder farmers who diversify into other business activities and trades on a secondary level, especially during difficult times.

Because agriculture lies at the heart of these communities, and because limitations of agricultural production increase the pressure on forest resources during hard times, it is recommended that research and development activities be carried out to make agriculture more efficient. This would mean intensifying production methods and diversifying the range of food and cash crops produced to reduce seasonal risk and the vulnerability associated with crop failure or limited harvest. This work should focus on educating communities about efficient agricultural practices and in providing the means and methods to develop these.

4 Concluding Remarks

Udzungwa Scarp, Iyondo, Matundu, Nyanganje, Ihanga and Iwonde forest reserves and the 'Idete corridor' forests are of considerable ecological importance for the extent of the biodiversity therein and because of their role as water catchment for the region and the nation as a whole. Maintaining the condition of these forests requires strict management regimes. However, as this study shows, the level of dependence on these forests by adjacent smallholder farming communities living in the Kilombero Valley suggests that in the short term at least a degree of utilisation of these forest areas should be possible under future management regimes.

This study has shown that a socio-economic perspective must be considered alongside a ecological perspective in considering future approaches to forest management. The livelihoods of the population in the area generally depend, in part, on forest resources. The views and needs of these communities need to be taken into account. Further to this, the communities must be integral to any successful management regime. If they do not have a sense of ownership or of benefit-sharing, they will have less inclination to look after the forests. Currently, whether cynically or otherwise, the communities indicate a willingness to act as custodians of the forest and this should be encouraged.

The area under study is large and the stakeholders many. Thus, greater focus on management options for each individual forest area will be essential.

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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 which will influence results and limit the accuracy of the data gathered. Careful consideration was therefore taken in assuring 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 15 villages to satisfy a balance of the following criteria.

- Relative locations, i.e. adjacent to the forests, along the length of the range
- Community being reliant on forest resources
- Villages are a fair representation of the area as a whole

The 15 villages were asked in advance to prepare two groups of community members for RRA discussions over one day of livelihood assessments per village, as well as a number of prioritisation activities and semi-structured interviews:

- Women
- 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.

2 Socio-Economic Baseline Study & Livelihoods Assessment

The methodology was based, with significant changes and adaptations by the writer, on Ireland (2004) and Malleret (2004) and took into account:

- Time constraints (under one day available per village)
- The need to gather specific information and perspectives relating to community livelihoods and the management and utilisation of the forest
- The need to allocate a substantial proportion of the time available to stakeholder consultations and reporting

The key approach with in the livelihoods assessment, however, namely the use of Rapid Rural Appraisal techniques, was maintained, as is discussed below.. All meetings were carried out in Kiswahili.

Sustainable Livelihood Assessments are a 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. In livelihood assessments, which were divided by gender group, attention is first paid on gathering perceptions of the livelihood assets (forms of capital/resources) available to the communities, divided into five types:

Table 37: Livelihood Assets

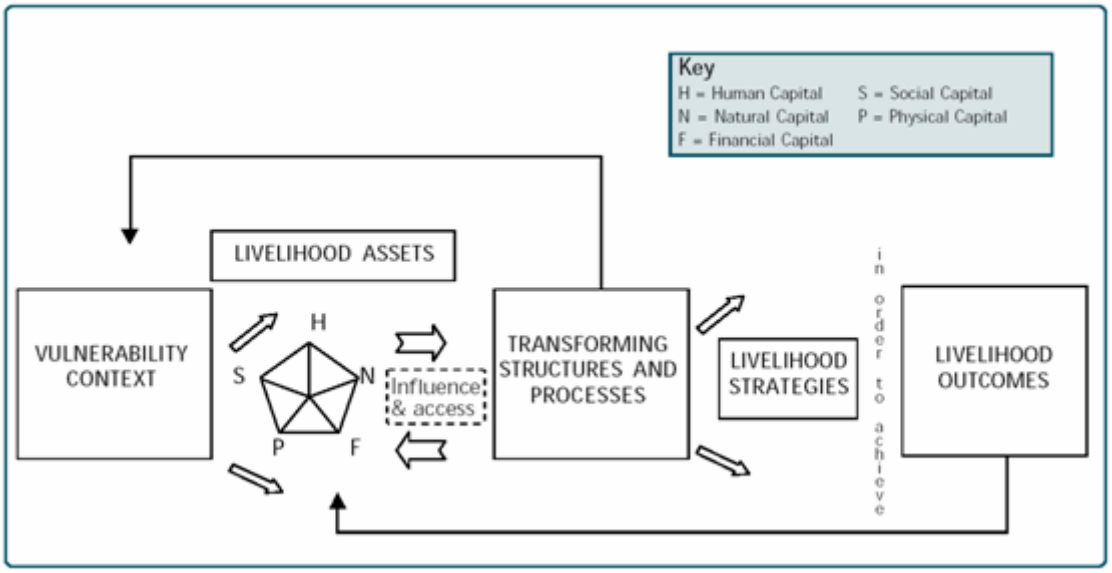
Natural	Land, forest, rivers, marine life, terrestrial life, biodiversity.
Financial	Savings in the form of cash and liquid assets such as grain, livestock etc.
Human	Knowledge, skills such as beehive making, good health, ability to work etc.
Physical	Roads and transport, buildings, communications etc.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

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

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 3: Sustainable livelihoods framework



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

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 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.

Semi-structured interviews (SSIs) were carried out for 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 reduce the likelihood of responses being coloured by other people's views. SSIs tended to be focussed at experienced individuals or representatives interested in expressing personal views.

4 Stakeholder Consultations

Stakeholders consulted were met face to face for SSIs. Interviews were either in Kiswahili or English. Due to time constraints other stakeholders or specialists who may have has an important input were unavailable to give input or there was insufficient opportunity to approach them.

Appendix 2: Quantitative Questionnaire

DODOSO
NAMBA YA DODOSO …….

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

TAREHE:……
JINA LA MSAILI:
KIJIJI: KITONGOJI:……..

MAELEZO KWA JUMLA

JINA LA MKUU WA KAYA:
JINSI YA MKUU WA KAYA? KE / ME
KAMA MKUU NI MWANAMKE :
(A) AMEOLEWA (N)/(H)
(B) NI MJANE N / H
(C). KAYA INAYOONGOZWA NA MWANAMKE? N/ H

WATU WANGAPI WANAISHI KWENYE KAYA HII?
MKUU WA KAYA ANA UMRI GANI?

ANAYETOKA MKUU WA KAYA
WEWE NI MZALIWA WA HAPA? N/H
KAMA HAPANA, ULITOKEA WAPI?
ULIKUJA MWAKA GANI?
NINI ILIKUVUTIA KUJA HAPA?

NYUMBA

KUTA ZA NYUMBA

UKUTA	**WEKA ALAMA**	**IDADI YA NYUMBA (B)**
NYUMBA YA MITI		
UDONGO		
MATOFALI YA KUCHOMA/BLOCK		

PAA LA NYUMBA

PAA	**WEKA ALAMA**	**IDADI YA NYUMBA (B)**
HAKUNA PAA		
NYASI		
MAKUTI		
MABATI		

RASILIMALI MTAJI:

WANA MIFUGO?

WANYAMA	**ALAMA (A)**	**IDADI (B)**
HAKUNA	0	
KUKU/BATA	1	
MBUZI/KONDOO	2	
NGOMBE	3	
NGURUWE		

WANA USAFIRI BINAFSI?

USAFIRI	**ALAMA**	
HAKUNA	0	
BAISKELI	1	
PIKI PIKI	2	
GARI	3	

WANAPATA WAPI MAJI?

MAJI	**ALAMA**
MTO/KISIMA/BOMBA LA BURE LA UMMA	0
WANAPATA MAJI KUTOKA MSITU WA HIFADHI	1
WANA KISIMA BINAFSI	2
WANA BOMBA NJE WAO BINAFSI	3
WANA BOMBA NDANI YA NYUMBA WAO BINAFSI	4
WANA TANGI LAO BINAFSI LA KUHIFADHI MAJI WANA	5

WANAPATA WAPI MALISHO? **WANAPATA WAPI KUNI?** **WANAPATA WAPI DAWA?**

ENEO	ALAMA	ENEO	ALAMA	ENEO	ALAMA
MSITU WA HIFADHI		MSITU WA HIFADHI		MSITU WA HIFADHI	
SHAMBANI		SHAMBANI		SHAMBANI	
ENEO LOLOTE WAZI		MSITU WA KIJIJI		MSITU WA KIJIJI	
		MITI YA NYUMBANI		MITI YA NYUMBANI	
		KUNUNUA		KUNUNUA	

GHARAMA YA MAZAO YA MSITU (1)

WAKINUNUA KUNI WANANUA KWA SHILINGI NGAPI? (KWA MZIGO MOJA?)
WAKINUNUA DAWA WANANUA KWA SHILINGI NGAPI? (KWA DOSE?)

WANAPATA WAPI NGUZO? **WANAPATA WAPI MKAA?** **WANFUGIA 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			

GHARAMA YA MAZAO YA MSITU (2)

WAKINUNUA NGUZO WANANUA KWA SHILINGI NGAPI? (KWA NGUZO MOJA?
WAKINUNUA MKAA WANANUA KWA SHILINGI NGAPI? (KWA MAFUNGO MOJA? KWA GUNIA MOJA?
WAKIFUGA NYUKI WANAUZA LITA MOJA KWA BEI GANI?

WANAPATA WAPI UMEME? **WANAMILIKI SHAMBA?** **WANAMILIKI NYUMBA?**

UMEME	ALAMA	SHAMBA	ALAMA	UKUBWA /EKA	NYUMBA	ALAMA	IDADI
HAKUNA		HAWANASHAMBA/HA WALIMI			WANAKAA NYUMBA YA NDUGU		
TAA		WANAAZIMA SHAMBA			WANAKODI NYUMBA		
BETTRY		WANAKODI SHAMBA			WANAMILIKI NYUMBA		
SOLAR/GENERATOR		WANAMILIKI SHAMBA					
TANESCO		WANA HATI MILIKI					

SHUGHULI YA MAENDELEO

TAFADHALI ORODHESHA SHUGHULI ZOTE AMBAZO WANA-KAYA WANAZIFANYA KWA AJILI YA KUJIKIMU NA KWA FAIDA ZINGINE (KWA MWAKA MZIMA). ANDIKA KUFUATANA NA UMUHIMU KWA KUWEKA NAMBA 1 MPAKA 4. ANDIKA KWANZA ILE SHUGHULI ILIYO MUHIMU ZAIDI IKIFUATIWA NA ZILE AMBAZO ZINA UMUHIMU KIDOGO (TAZAMA KIELELEZO NAMBA 1 HAPO CHINI)

SHUGHULI	UMUHIMU WA SHUGHULI KWA MAHITAJI YA KAYA	FAIDA NI PESA	FAIDA NI CHAKULA

JE, KAYA HII, INA WAFUATAO?:

SHUGHULI	IDADI
WAVUNA MBAO	
WAWINDAJI WA WANYAMA PORI	
WAKULIMA	
WAFUGAJI	
WAAKUSANAYAJI WA MADAWA YA ASILI KWENYE MSITU WA HIFADHI	
WATENGENEZAJI VIFAA VITOKANAYO NA MSITU (MIKEKA NA VIKAPU)	
WAFANYAKAZI AU VIBARUA KWENYE MASHAMBA MAKUBWA YA KILIMO N.K.	

SOURCE: AFTER MALLERET (2004) WITH ADDITIONS AND ADAPTATIONS BY PAUL HARRISON (2006)

Appendix 3: Livelihood Assessment Checklist

The following checklist was developed, purely as a guide for reference by facilitators during livelihood discussions. Flexibility was accepted in gathering information rather than following the checklist verbatim depending on the flow of discussion and on time available.

LIVELIHOOD DISCUSSIONS

In separate groups (grown men, grown women)

1. IDENTIFYING ASSETS

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)
River, lake life. What types of fish?
How much land is available for activities?
Is there any land not being used? Why not?
Where do the asserts come from?

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

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?

WHAT HUMAN ASSETS?
What skills do you have?
What 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?
What cultural assets and practices?
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?

2. 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 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. 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.

3. 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.

1. Begin by asking the group when the start of the year is and how they break down the year (by months or seasons). Depict this on the ground/flip chart.
2. Begin by asking:
    - Is this a good year or a bad year and why?
    - How does this year compare to last year specifically?
3. In the different rows begin to fill in a picture of the following issues: Dark should be hard times.

Month/Season	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Season/rains												
Men's/women's workload												
Income generating activities												
Income - good months, bad months												
Expenditure – highs and lows												
Prices – highs and lows												
Markets – good months, bad months												
Human Disease												
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?

4. PROBLEMS & CONSTRAINTS

Purpose: To identify problems and constraints to people achieving their livelihood goals.

Steps:
1. Discuss problems and constraints
2. Discuss causes of these problems.
3. What opportunities might there be for improving different livelihood activities and addressing problems in the long-term? (by individuals, community, government).

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:
1. Discuss local and outside community institutions, and see to how they do or don't work together to meet the community's needs.
2. Find out from the group "Which organizations, in and outside the community are involved that particular livelihood activity.
3. Establish which of these are "more important" or "less important" organizations and why.

6. LIVELIHOOD DISCUSSIONS

Questions:

LIVELIHOOD ACTIVITIES
What livelihood activities?

1. From their comments pull together a list of the different livelihoods that the participants are engaged in. If more than 6 ask them to identify the 6 most important to them as a group.

2. Identify a list of criteria from each of the group members as to what is good about the livelihood activities/why they undertake a livelihood activity, for example:
    - get good income from the activity
    - does not take much time
    - lots of resources for activity
    - access is good
    - easy to do
    - we have the skills required
    - can do year round
    - brings additional/supplementary income
1. Ask the group to rank the criteria by importance.
2. Plot the activities across the top of a matrix and list the criteria down the side of the matrix listing the most important criteria first.
3. Ask the community for each of the activities who in the community has access to the livelihood activity and which institutions influence that particular livelihood activity and make a note in the relevant boxes to their answers.
4. Discuss the findings with the group i.e. which activity is the most important, which is the next most important and so on.
5. Ask the group whether this is actually happening in the village or is it a desired preference that they aspire to.
6. Do they have any other livelihood preferences/aspirations? What are these?

Additional questions:

- How much do you spend as a household per month?
- How much income do you get per month?
- What livelihood activities do you get income from?
- Which livelihood activity brings you the most money?
- How much do you have left over each month per household?

6. FUTURE LIVELIHOOD ACTIVITIES

Moving forward: the future

1. How do you propose to move forward?
2. Which livelihoods? Current? Alternative?
3. What are the logistical requirements?
4. What costs and benefits and limitations are perceived?
5. What land/labour/capital/enterprise requirements?
6. Which community members would be involved? Which would not?

This need not be taken to any detail, only to understand their aspirations as a community/individuals.

6. VIEWS TOWARDS CONSERVATION, THE FORESTS AND THE PARK

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?
- 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?
- Do you know any natural resources policies? Mention them
- 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 forest products are available in the forests?
- What are the indigenous trees and animal species do you know exist in the forest?
- 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 befit from tourism activities?
- Have you benefited so far? How? If not, why not
- Have you got any environmental education? What did you learn?

7. 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.

SOURCE: AFTER IRELAND, (2004) WITH CONSIDERABLE ADDITIONS AND ADAPTATIONS BY PAUL HARRISON (2006)