Evaluation Department

Norad

# Environmental and Socio-Economic Baseline Study – Malawi

**Study 4/2009**

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# Environmental and Socio-Economic Baseline Study – Malawi

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Scanteam is responsible for the content and the assessments of the report. The views and conclusions in the report do not necessarily correspond with those of Norad or its Evaluation Department.

# Contents

# Acronyms and Abbreviations

| | |
|---|---|
| ADP | Agricultural Development Program |
| AIDS | Acquired Immunodeficiency Syndrome |
| CBNRM | Community-based natural resource management |
| CBO | Community-based organisation |
| DEVPOL | Statement of Development Policies |
| EPA | Extension Planning Area |
| FAO | Food and Agriculture Organization |
| GDP | Gross domestic product |
| GVH | Group village headman |
| Ha | Hectare |
| HBC | Home-based care |
| HIV | Human Immunodeficiency Virus |
| IGA | Income generating activity |
| IHS | Integrated Household Survey |
| MoAFS | Ministry of Agriculture and Food Security |
| MEGS | Malawi Economic Growth Strategy |
| MDG | Millennium Development Goals |
| MGDS | Malawi Growth and Development Strategy |
| MPRSP | Malawi Poverty Reduction Strategy Paper |
| MK | Malawi Kwacha |
| MMCT | Mulanje Mountain Conservation Trust |
| NAPA | National Adaptation Program of Action |
| NASFAM | National Association of Smallholder Farmers of Malawi |
| NGO | Non-governmental Organisation |
| Norad | Norwegian Development Cooperation |
| NSO | National Statistical Office |
| PAF | Performance Assessment Matrix |
| PTA | Parent Teacher Association |
| SPSS | Statistical Package for Social Sciences |
| STI | Sexually Transmitted Infection |
| STD | Standard Deviation |
| TA | Traditional Authority |
| TLC | Total Land Care |
| USD | United States Dollar |

# 1. Executive Summary

*The Norwegian Environmental Action Plan* for environmental support in development cooperation includes an evaluation of the results when the implementation period ends around 2015. In order to facilitate a quality impact evaluation, Norad's Evaluation Department decided to carry out a Baseline Study related to the Action Plan in three case countries—Indonesia, Malawi and Tanzania. The purpose of these studies is to establish the current status in some Norad supported sites/districts in terms of socio-economic situation, state of the environment and driving forces to environmental destruction with the aim of using the information as benchmark to evaluate impacts of Norwegian Government support.

*The Malawi case study* addresses particularly the activities of the in areas where Total Land Care (TLC) and Mulanje Mountain Conservation Trust (MMCT) are operating with Norwegian as well as other support. These areas are located within Nkhotakota and Ntchisi districts (Central Region) and Mulanje and Phalombe districts (Southern Region).

*The primary aims of this baseline survey* were (a) to assess the relevance of existing data and reporting systems on national level and for the selected programmes in Malawi; (b) to supplement data that already exists or soon will be collected, with emphasis on four case studies of socio-economic effects of environmental related assistance at the local level, (c) to clarify data and interpretation problems, and (d) especially, to identify other factors that are likely to influence developments in the targeted areas during the implementation period.

*The survey provides a basis for monitoring changes* over environmental and societal conditions of the life of the projects and beyond. The fieldwork included environmental audits to assess the status of environmental degradation in key environmental hostspots on Ntchisi Forest Reserve and Mulanje Mountain and a detailed 20 community-level surveys and 616 household interviews. The households were selected randomly from a complete listing assembled prior to the conduct of the survey. The 20 community surveys were undertaken in the 20 villages in which household surveys were conducted.

*From the environmental audits, environmental degradation is a serious concern* in both sites where, due to population pressure, demand for land and forest products have led to environmental degradation manifesting itself through low canopy cover, low ground cover and low tree volume and regeneration rates. There is high human disturbance within the forest reserves due to demand for forest products especially

timber and charcoal, especially in Mulanje and Phalombe. Deliberate clearing or barking of eucalyptus which was used as buffer zone surrounding Mulanje Mountain for farming was visible in Mulanje.

*The average household size in the sample was 5 members*. This is above the 2005 IHS rural average (4.6). The majority of households are headed by men, but the proportion of female-headed households in the sampled population of 33% exceeds the national average. A comparatively large number of children and youths dominate the population sample.

*The education level* of most household heads was generally low, with a significant number of household heads being illiterate. The reported level of school attendance was also low; about 80% at the primary school level, and much lower at kindergarten and secondary school levels. It seems important to focus on the key reasons for non-attendance at school, particularly at the primary level.

*The health situation* was poor, as demonstrated by the high incidence of malaria, air/waterborne diseases, and eye diseases, among others. Malaria and waterborne diseases are preventable through treated bed nets and improved sanitation, respectively, and should be the focus of intervention to reduce morbidity in the project area.

*Most of the sampled houses are traditional in design*, mostly with mud walls (46%) and grass-thatched roofs (80%). However, the sample includes some modern houses with walls made of burnt bricks (27%) and roofs with corrugated iron sheets (20%).

*Agriculture was the dominant economic activity,* constituting about 70% of household incomes, and more than 90 per cent of foreign-exchange earnings. Ownership of chicken was common, and more than one-third of households have goats. Cattle-owning households are extremely rare. Agricultural plot sizes were very small and all households work in their fields using a hoe. There were very few other productive assets. Community members had inadequate access to credit. Friends/relatives, NGOs and Government were the major sources of the limited credit currently available. In terms of spending, the highest proportion of household income was spent on food because the households were far from producing sufficient amounts themselves. The second and third highest level of spending was on farm inputs and medicines, respectively.

*The average size of land ownership* was less than a hectare. This is inadequate for farmers to produce enough food for their own needs. Most land was obtained through inheritance.

Maize is the common staple crop in all districts. In Nkhotakota and Ntchisi, tobacco and groundnuts were also important crops, as were tea and cassava in Mulanje and Phalombe. Agricultural production was limited by a number of factors, including shortage of land - especially in Mulanje and Phalombe and relatively high agricultural input costs. Some farmers used compost and small quantities of manure as a

strategy to deal with high input costs. Households used a number of soil and water conservation techniques, mainly box and contour ridges, to control soil erosion.

*Very few households had their own planted woodlots*. Among those that had them; the average plot size was less than half a hectare. Acacia and Blue gum (Eucalyptus) were the most common species grown. The Forestry Department was the major source of tree seedlings. Households-use forest products were mainly obtained from the forest reserves and forest plantations (often illegally), village or community forests, their own woodlots, private markets and/or farms. Forest products used include firewood, timber/poles, thatch grass and wild food (e.g., game, fruits and mushrooms). Most of these products were collected for free at a distance of less than a kilometre from the homestead. In Mulanje and Phalombe, collection of timber occurred only at a greater distance. Phalombe had the highest number of households involved in the sale of forest products, particularly firewood and charcoal. Most of the forest products were collected by women.

*Most households were found to run out of self-produced food well before the annual lean period* (December to March). The situation was worse for female-headed households. The households in Mulanje were the most insecure, while on average households in Phalombe, Nkhotakota and Ntchisi were a little better off. Most households reported reducing meals during critical periods. Across all districts the most common coping mechanisms was piece-work or "ganyu". Apart from insufficiency in foods, a large proportion of households were frequently traumatised by drought, floods and death of a household member. Households were often left completely helpless, in terms of coping mechanism for these external shocks. The government and NGOs have provided relief items in some instances, which by far do not reach all households in need.

*Current efforts to build local or grassroots institutions* include community-based natural *resource* management (CBNRM), formal credit clubs, informal credit clubs, farmers' clubs, community-based organisations (CBO)/ home-based care organisations, bee–keeping clubs, village health committees, parents and teachers associations (PTA) and school committees. However, despite a high level of awareness, most households were not members of the existing local institutions. Participation rates were high in CBNRM, with male dominance. Nonetheless, the principle of gender equality was becoming more entrenched in the rural areas. Women participated actively in some of these local institutions, especially those dealing with family welfare, in which they took, at times, leadership positions, including that of the chairperson.

*Agricultural incomes were very low* in all districts due to small agricultural plots, incidences of crop failure, relatively high agricultural input prices, low access to agricultural credit and services, and impoverished soils. The key drivers of this change, as seen by the respondents of the study, included a high population increase and lack of land to open new farms. In the health sector most indicators have worsened due to several factors including the HIV/AIDS pandemic and increasing number of foster children. Long distances to hospital were also a critical factor for timely medical treatment.

*The proportion of school-attending children* has increased significantly, as have the quality of education. The primary recent drivers for this change were an increased awareness of the importance of education and favourable policies introduced by the government (like free primary education). However, due to shortage of teachers, adult education has worsened during recent years.

*Uncontrolled access to protected forests* has enabled new land clearing for farming at a level which represents a serious threat to the conditions of the natural resources and the environment. Population increase was seen as the main cause of deforestation which, in turn, was the prime cause of firewood scarcity in all the districts. The increased occurrences of natural disasters and rainfall fluctuations were ascribed to climate change. The respondents perceived that there has been a worsening of their life situations over the years, especially related to corruption, employment opportunities and the general poverty levels.

*Key public and private services* were available or accessible in the districts, although a majority of the respondents in Mulanje, and partly in Ntchisi, stated that they do not have ready access to postal and telephone services, agricultural extension services, markets for input supplies and sales of crops. Otherwise, most services were rated as good. The services with highest demand by households included safe water taps/outlets, credit/lending institutions, agricultural markets and health care. Generally, the households were prepared to make their own contributions to the provision of these services in these areas, including through voluntary work, and forming savings and credit clubs, among others.

About two thirds of the forest environmental audit/audit done by the study team in Malawi covered public land, while the remainder was conducted on village lands. More than 70% of the areas had no indication of forest management, because no co-management arrangements had been put in place between the Forest Department and the surrounding communities. For this reason there are increasing signs of distress on the natural resources in all the four study areas, contributing towards increased poverty of the adjacent villages. The Phalombe/Mulanje districts are under the heaviest pressure for commercial exploitation of the wood products. Illegal logging for fuelwood, construction poles and timber was rampant in Phalombe with more than 80% of the areas being cut. Encroachment, including logging, affected 50% of the studied areas in Mulanje.

In the lower parts of the forests people have open access for fuel-wood collection in the forest reserve. There was pronounced evidence of human disturbance of natural resources in all the forest and community reserves. The most common human disturbance was unregulated fires. A high level of illegal logging for fuel-wood (especially charcoal and firewood) and construction materials was also observed.

Most of the areas in Ntchisi and Nkhotakota were burnt over, exposing a high percentage of uncovered soil and ashes. Farmers clearing these areas in Mulanje for illegal cultivation were destroying any regenerant growth. Erosion is currently a problem in the hilly regions of Malawi, exacerbated by inadequate land-use technology – bush clearing, frequent wildfires and a low level of terracing.

Concerning the special study of environment as a cross-cutting issue, called for in the TOR, the study team found ample evidence that the Norwegian aid administration had raised issues of mainstreaming environmental matters in annual meetings and portfolio planning sessions with their Malawian counterparts. However, it is the view of the team that the follow through of the environmental concerns have been far from systematic, since these are only reflected in a minority of cases in guiding documents like formal agreements, contracts, agreed minutes and activity planning. The team also found a lack of environmental indicators in general projects, as well as lack of environmental and social impact assessments in project planning and impacts evaluations.

# 2. Introduction

## 2.1 Background

Malawi, a land-locked country in South-Eastern Africa, has an economy dominated by agriculture and strongly dependent on the environment and its natural resources. Agriculture accounts for 35-40% of the Gross Domestic Product (GDP). More than 80%of the country's population are directly or indirectly employed in the agricultural sector, which also account for nearly 90% of foreign exchange earnings. The forestry sector provides about 90% of energy requirements in Malawi and plays an important role in supporting the livelihoods of many smallholder farmers, by providing energy for cooking, food, medicines, fruits, shade and water (T, Kalebe, Minister of Energy, Malawi).[1]

About 90% of the population in Malawi lives in the rural areas, where both wage employment and chances of escaping poverty based on small-holder agriculture are currently very limited. High population growth continues to exert pressure on natural resources. Both customary land and protected areas are over-exploited for firewood, timber, charcoal and curios, for use in homes or for sale at roadside or in towns and cities. The management of natural resources is an increasingly big challenge, including the fisheries sector, which is not dealt with in this report.

The forests supply 90% of total household energy needs. They are also an important source of government revenue through royalties, fees and taxes on exported forest products (e.g., sawn timber, curios). The increasing levels of deforestation and environmental degradation threaten the natural resource base on which the livelihoods of people depend. The environment is also affected by increasing frequencies of floods and droughts. Gentle and adequate levels of rainfalls are becoming rare; more often rainfall is characterised by torrential downpours that destroy the fertility of soils and other property. Yet, Malawi and most countries in Africa will have to continue to rely on rain-fed cultivation for any substantial increases in food supplies in the short run (FAO 2007). As such, African governments require major changes regarding the conservation of the natural resource base in order to achieve greater self-reliance in food and increased agricultural productivity.

## 2.2 Environmental and Socio-economic Policies in Malawi

In order to achieve both greater self-reliance in food and increased agricultural productivity, Malawi has stated its efforts and/or aspirations to conserve the natural resource base in a number of official policy documents. Up to 2000, Malawi's

1 The Daily Times, December 4, 2008

agenda for improving people's livelihoods was articulated in a variety of official documents such as the Statement of Development Policies (DEVPOL) of 1971–1980 and of 1987-1996. In the year 2000, Malawi launched its new development policies in "Vision 2020" after an extensive consultative process. In this document, the environment was included as one of the strategic challenges. Regarding this challenge, the Vision focuses on:

"How to prevent and control land degradation, attain sustainable utilization of forests, promote effective and sound human habitat, control high population growth, prevent and control air pollution and climate change, control noise pollution, prevent improper management of industrial and hazardous wastes and enhance political advocacy for natural resources and the environment" (Malawi Government 2000, p3).

Subsequent development strategies with a shorter-term focus have been formulated around this vision. Currently, the Malawi Growth and Development Strategy[2] (MGDS) is the overarching policy document for achieving sustainable economic growth in Malawi. The MGDS is organised in five themes, and identifies six key areas: (i) agriculture and food security; (ii) irrigation and water development; (iii) infrastructure development; (iv) energy generation and supply; (v) HIV and AIDS prevention management; and (vi) integrated rural development. Recognizing the essential role of natural resource management in economic development, the MGDS includes strategies to improve the management of fish species, forest and wildlife biodiversity, to reduce environmental degradation and to conserve the natural resource base, while contributing to economic growth.

Prior to the MGDS, Malawi published an updated State of the Environment Report in 2003. Since then, the government has introduced a yearly review of the state of the environment, reporting on progress on its development strategy. The National Adaptation Program of Action (NAPA 2006) identifies five broad areas of focus relevant to climate change adaptation, as priority pillars in achieving sustainable agricultural growth and development: (i) food security and risk management; (ii) agri-business and market development; (iii) land and water management; (iv) research, technology and dissemination; and (v) institutional development and capacity building.

Another related sector document is the Agricultural Development Program (ADP) (2008-2011), which presents a ADP results framework that gives a clear picture of national priorities and will be the basis for planning at all levels. It will also be the basis for monitoring the ADP and, as such, will be the main monitoring and evaluation instrument of the Ministry of Agriculture and Food Security (MoAFS). It is envisaged that each district will identify which of the national level priorities are applicable to its own circumstances. Local level priorities must then be incorporated in the annual work plan and budget. The identification of these local priorities will be done through a participatory planning methodology that will allow districts to reflect some of the priorities of the farmers at grass-roots level (ADP, p. 80). It is

2 The MGDS covers a planned lifespan of 2006-2011, following the MPRSP with a planned lifespan of 2002-2007 and MEGS with a planned lifespan of 2004-2008

envisaged that existing initiatives in planning and monitoring, such as the current baseline study, will be taken into account in the further elaboration of the ADP monitoring and evaluation system. It is foreseen in the ADP that intermediary outcome indicators will include the following: percentage of farmers using irrigation techniques, percentage of farmers using fertiliser, percentage of farmers adopting improved technologies (to be specified), percentage of farmers being member of a farmer organisation, percentage of farmers having access to credit, percentage of farmers engaging in livestock production, etc. This information, currently unavailable, is vital for monitoring changes at sector level and providing feedback for policy discussions and for management decisions in the Ministry of Agriculture.

## 2.3 Malawi-Norway Development Cooperation

Malawi's aspirations and efforts, as outlined in the above-described national policy documents, particularly the MGDS and ADP, correspond well with the general development and environmental objectives of the Norwegian development assistance. The Norwegian Action Plan for Environment in Development Cooperation sets the direction for Norway's efforts during the ten year period 2006-2015, to contribute towards achieving the Millennium Development Goals (MDGs) and make it possible for poor people to improve their living conditions, health and reduce their vulnerability. The ultimate goal of Norway's development efforts is to play a leading role in making environmental concerns an integral part of all development programmes by building the capacity and competence that enable developing countries to safeguard their right to clean environment and the ability to manage their natural resources in a sustainable manner. The new sectoral programme includes a new monitoring and evaluation system at both national and local levels.

The two programmes selected for environmental audits and socio-economic surveys in Malawi, were the programme of Total Land Care (TLC) operating in the Nkhotakota and Ntchisi districts, just west of the central portion of Lake Malawi, and the Mulanje Mountain Conservation Trust (MMCT) in the south-eastern part of the country. These two areas were subjected to 20 village surveys, 616 household interviews, in addition to two environmental audit transects in each of the two relatively large programme areas. The results should only be considered as representative and indicative for the whole programme areas. However, the audits and surveys have spurred the interests in documenting results by the two NGOs, and it is highly likely that other studies will be added during the coming years.

### *2.3.1 Total Land Care: Management for Adaptation to Climate Change*

The target area for the programme known as "Management for Adaptation to Climate Change", implemented by Total Land Care (TLC), comprises 10 extension planning areas in 5 districts in central Malawi. However, the baseline surveys cover only two of them, locations in central Malawi, i.e. Ntchisi and Nkhotakota Districts, where the Ntchisi Forest Reserve and the Nkhotakota Wildlife Reserve are located. The natural resources of the forest reserves,watersheds and streams originating in these two locations supply a large downstream population with water and many other kinds of natural products. An increasing population is exerting a tremendous pressure on the natural environment, causing serious environmental degradation in some parts.

TLC is using an operational framework for an integrated community approach based on the Chia Lagoon Project in the central portion of the project area. It seeks to promote transition from aid-dependent subsistence to market-based livelihoods through capacity building and small scale investments. Its modus operandi is to provide intensive support to villages for 1-2 years, after which the villages are expected to be able to sustain the project activities. For this work, TLC has a team of specialists covering project management, community-based natural resources management, fisheries, enterprise development, agri-business, and monitoring & evaluation. The programme will potentially affect more than 750 000 people. The plan for Norwegian support is to scale up an ongoing pilot project which emphasises local community development more broadly, with environmental stewardship, sustainable land and water management being key elements of the project. The project will include a monitoring and evaluation system with natural resource indicators and village profiles. It may facilitate analyses of the relationships between inputs, outputs and impacts.

### *2.3.2 Mulanje Mountain Conservation Trust: Biodiversity Conservation*

Mulanje Mountain is an isolated mountain plateau in the south-eastern part of Malawi with rich forest ecosystems and woodlands. For almost ten years, the Mulanje Mountain Conservation Trust (MMCT) has been seeking to improve the environmental and socio-economic situation in the area, in cooperation with the Forest Department (FD). It was aided during the initial years by a number of external donors, including the Global Environment Facility, the World Bank, USAID, and more recently Norwegian aid. During recent years, MMCT has been working on registration and mapping of the natural resources on the mountain, and they have developed a local monitoring program that partly satisfies the need for a natural resources baseline as defined for the Norwegian Environmental Action Plan.

The biodiversity is very rich on and around the mountain, particularly in the more inaccessible spots, where the ecosystems are still intact. It contains a vast number of trees, plants, as well as several (endemic) smaller mammals, reptiles and birds. A small population of wild cats (leopard and serval) are also present in the area. In spite of tremendous pressure for their exploitation, a limited number of the Mulanje cedar (Widdringtonia whytei) are still found on the mountain.

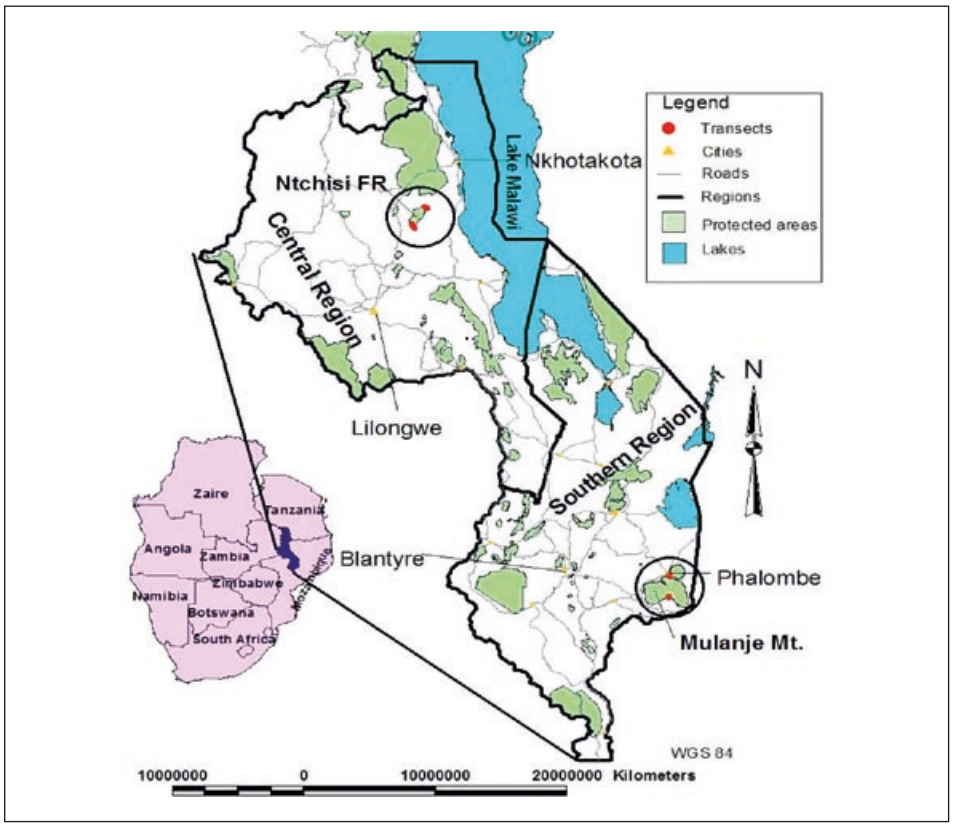
Apart from biodiversity conservation, MMCT is engaged in a number of activities, including development of alternative livelihoods to replace unsustainable forest extraction and making efforts to eradicate invasive species, mainly exotic pines. The area covered by invasive pines has been established in the local baseline, enabling the level of reintroduction of native species to serve as a positive environmental indicator.

Forest fires are a serious problem on the mountain. Most of these are set by charcoal burners and illegal hunters. MMCT has begun monitoring this situation. A baseline of the general situation and frequency of fires at the time of the initiation of Norwegian support should be established, in order to register any changes caused by the project over time. This baseline should also consider law enforcement efforts, environmental education and communication with local communities.

### *2.3.3 Integration of environment in general Norwegian development assistance*

In addition to the baseline studies linked to the two Norwegian aided programmes of TLC and MMCT, this report reflects an additional review of how various non-specific environmental sectors have integrated "environment" as a cross-cutting issue. The TOR asserts that "several recent studies both of joint and bilateral assistance[3] indicate that 'environment' has not been treated properly as a cross-cutting issue," and it is reasonable to assume that the situation is similar in the case of Norwegian assistance on non-environmental matters. The study team was required to study this matter, by considering a small random sample (5-10%) of "non-environmental programmes" implemented in Malawi and Tanzania in 2007/08. The results are presented in Ch. 13.

***Figure 1: Study areas***




## 2.4 Scope and Objectives of the Baseline Study

The baselines in this study will represent benchmark indicators to measure the impact of the Norwegian development assistance by 2015. For this purpose the study:

a) Assesses the relevance of existing data and reporting systems on national level and for the selected programmes in Malawi;

3 A joint Evaluation of General Budget Support 2006 and evaluations done by SIDA, DANIDA and the Dutch evaluation department have the same conclusion

b) Supplements data that already exists or soon will be collected, with emphasis on four case studies (two related to each assisted intervention) of socio-economic effects of environmental-related assistance on local levels;
c) Clarifies data and interpretation problems, and
d) Attempts especially to identify other factors that are likely to influence developments in the targeted areas during the implementation period.

A number of approaches were used to fulfil the objectives of the study, including a desk review, an environmental audit, and household and community surveys, all of which are presented below. Additional data on the methodologies used for the two studies are presented in Annex 1 to this report.

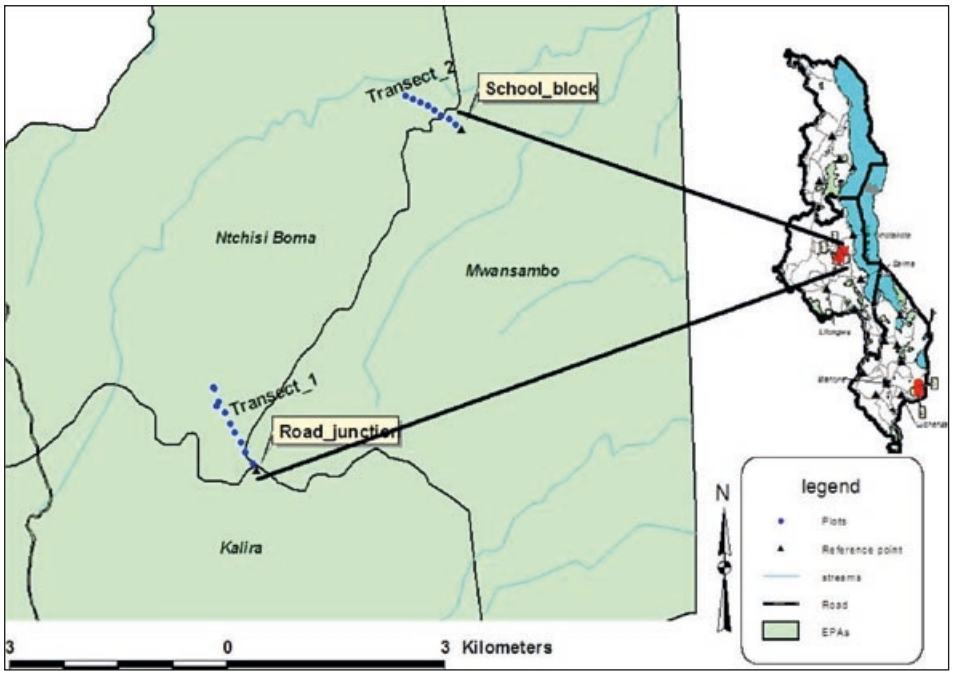
# 3. Environmental Assessment

## 3.1 Environmental Audit Methodology

An environmental audit can be viewed as a "snapshot" of the environmental situation at a given site and time. It does not, like most environmental assessments, attempt to predict the potential impacts of planned investments, although it does identify environmental risks associated with an existing operation or a planned expansion. A prerequisite to successful implementation of any aspect or type of environmental audit is the commitment of the project developer to maintain, or move toward sound environmental practices (as stated in the Norwegian Environmental Action Plan, in this case). As a systematic process of obtaining and evaluating information about the environmental aspects of a site, the environmental audit will generally require:

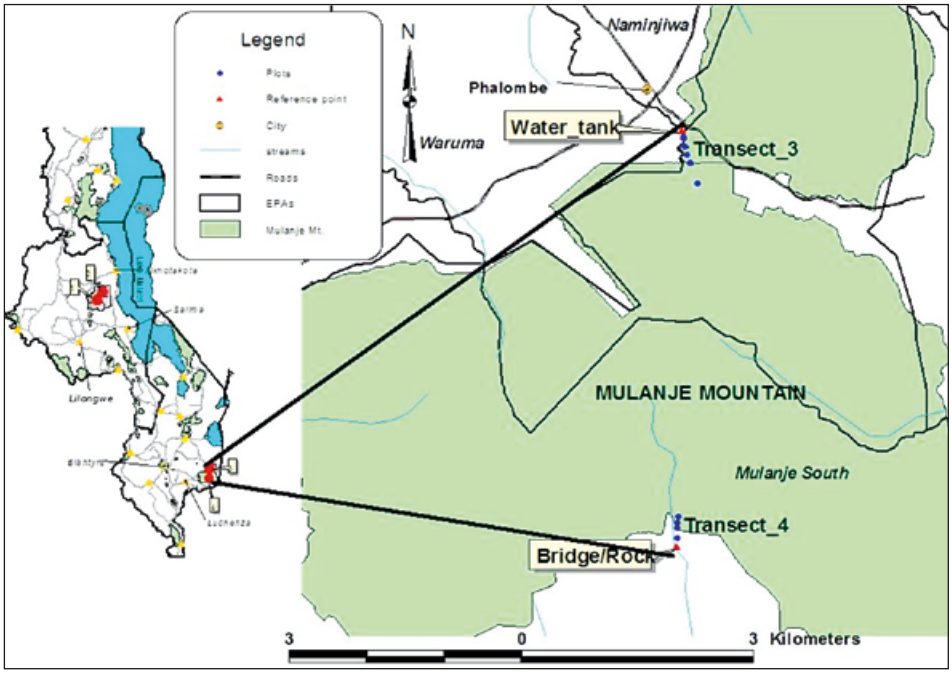
- sufficient and appropriate information about the site;
- adequate resources available to support the audit process;
- adequate cooperation from the entity that is being audited (auditee); and an audit protocol (e.g., a checklist or questionnaire).

***Figure 2: The Ntchisi and Nkhotakota transect lines***



An environmental audit is normally undertaken by environmental "auditors", based on objectives defined by the development agency. It is presumed that the team of auditors will follow systematic procedures. An environmental baseline audit is less comprehensive than a full inventory, but provides a registration of natural phenomena along transects and thus provides a picture of the resource situation in the selected area at a specified time. This audit describes observable and significant changes of land use along the transect lines, even those that are outside the transect plot boundaries. Auditors returning to the sites after several years, will easily be able to identify changes in land use and resources, by comparison with the original baseline data.

***Figure 3: The Phalombe and Mulanje transect lines***




The environmental transect line (Figure 2) locations were selected by the study team and the implementing agencies after a scoping exercise, whereby the parties travelled extensively through the areas to be affected by the Norwegian aided programmes. Different alternatives were discussed, based on terrain and land use. The basic concept was to find a location not too far from the identified forest reserves, which would be easily identifiable both at this stage and in the future. The transect lines extend from cultivated lands near the reserves, through community woodlands and end well inside the forest reserves, where little human disturbance has been recorded. The team registered a gradient of human pressure through a cross-section of the landscapes. The study team undertook transect recordings through Ntchisi Forest reserve in Nkhotakota/Ntchisi and Mulanje Mountain in Phalombe to assess and audit the natural resource conditions in the area (see figures 2 and 3). More details on implementation of the environment survey are presented in Annex 1.

## 3.2 Climate

Malawi has a tropical continental climate with three distinct seasons (Banda, 2004):

- a cool and dry season from May to August,
- a warm and dry season from September to November,
- and a warm and wet season from late November to April.

The latter is the rainy season, when most plants regenerate and farmers plant rain-fed crops. The audit in Nkhotakota and Ntchisi was conducted at the end of the warm and dry season in this climate regime.

The climate in Phalombe and Mulanje is greatly affected by the mountain, and also partly by the Chiperoni winds, which normally occur from May to August and are caused by advection of low-level cool moist south-easterly air mass into Malawi. These rains are generally good for growing winter crops. The Chiperoni winds are associated with cold temperatures that characterise the high altitude areas at this time of the year. The climate lower down the mountain slopes is warm to hot and humid throughout most of the year, with annual temperatures averaging 21–23° C and maximum temperatures around 32–35°C during November and December. The average annual rainfall is 1,600 mm, 16% of which falls during the dry season from May to October.

## 3.3 Ecosystem/forest types

Land in Malawi is categorised as: i) customary land under the jurisdiction of traditional leaders, ii) public land owned by the government, and iii) private land, which is leased to private individuals. The audit was conducted mainly on public land (68%). All plots in Phalombe were laid on public land, as were the majority in Mulanje (80%) and Nkhotakota (60%). Customary land constituted about 29% of the plots and a mixture of customary and public land made up the remainder. The major vegetation type in the study areas is miombo woodland (45%) dominated by the species of genera Brachystegia, Julbernadia and Isoberlinea. Patches of munga woodlands (Moringa spp.) were also found in Nkhotakota. The planted forests registered in two study areas represent by a ten year old Pinus patula plantation in the Ntchisi forest reserve – covering the upper ridges – and a eucalyptus plantation on the border of the Mulanje Forest Reserve – constituting a boundary and buffer belt between the tea plantations, nearby villages and the forest reserve, in order to limit encroachment into the reserve.

Some land areas in both transects lines were recovering, and are currently dominated by elephant grass pursuant to subsistence agriculture having moved out. A small area of low altitude rain forest at the base of Mulanje Mountain is located within transect 4. This rainforest belt is very rich in biodiversity. The main vegetation types and proportion of particular vegetation classifications within the four transects are presented in Table 1.

***Table 1: Proportion of main vegetation types in each study area (%)***

| Transect | Ecosystem | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Agriculture | Shrub land | Miombo | Grassland | Mixed forest | Plantation | Munga | Rain forest |
| 1 Ntchisi | 10 | 20 | 20 | 20 | 20 | 10 | 0 | 0 |
| 2 Nkhotakota | 12.5 | 0 | 75 | 0 | 0 | 0 | 12.5 | 0 |
| 3 Phalombe | 0 | 0 | 83 | 0 | 17 | 0 | 0 | 0 |
| 4 Mulanje | 25 | 0 | 0 | 0 | 0 | 50 | 0 | 25 |

## 3.4 Forest Land Utilisation

As of the 1990s, Malawi's national parks, wildlife reserves, and forest reserves covered approximately 21% of its total land surface area (Bishop, 1995). They were established in order to preserve Malawi's biotic communities and conserve watersheds/catchment areas.

The primary land-use category within the areas studied was reserves (68%), which are under the control of the Forest Department and in which permit-based harvesting is undertaken. These areas were in parts severely degraded, suggesting that biodiversity conservation and protection of ecological services ought to be an important concern. Other land-use categories recorded by the audit were agriculture (mainly for subsistence) constituting 14.3%, and community woodlands and degraded areas, together totalling 14%. Along the Ntchisi transect small patches of natural woodlands separate agricultural holdings for a distance, until the line reaches the forest reserve. This pattern was not found along the other transects. Lack of government or community control in the reserves, have led to illegal encroachment by the local population for firewood, charcoal and other products. The Ntchisi transect crossed a few areas of abandoned agricultural land in steep slopes, which were degraded down to bedrock because of overuse and frequent burning. As a response to this, efforts are attempting to establish village woodlots. Among others, TLC has established community wood plantations (in Ntchisi), providing a source of sustainable energy and building poles for some local communitiess.

### *3.4.1 Charcoal and timber off-take*

Charcoal or firewood off-take from the reserves was significant in all areas, but particularly in Phalombe, where a high level of illegal charcoal production was found and 67% of the plots in the reserve showed recent signs of charcoal burning. The study team encountered illegal earthen charcoal kilns, as well as frequent signs of recent charcoal burning in the form of large diameter tree stumps. Extraction of other timber products especially firewood and construction poles was also high. In Phalombe, the most forest products are sold in the neighbouring Phalombe town and the more distant regional centre, Blantyre.

It is estimated that more than 90% of urban dwellers rely on biomass energy – mainly charcoal – for cooking, and spend more than three times as much on biomass fuel as they spend on electricity (Kambewa et al. 2007). Charcoal trade is considered Malawi's most substantial, pro-poor forest industry, which employs about 93,000 people as producers, bicycle transporters and roadside or urban vendors (Ibid). Charcoal is potentially a renewable forest product, and there is an urgent need to revisit the current illegal off-take and have it organised within a legal production and distribution system that secures sustainable use of the forest resources. The scale of charcoal production, if regulated, could make it one of the country's top earners after tobacco and tea, and would also encourage the sustainable use of wooded areas (Ibid).

### *3.4.2 Canopy closure*

The canopy cover was registered for all the plots along the transect lines that were within community forests or forest reserves. The audit was conducted during the dry season when many deciduous trees had lost their leaves. The canopy closure figures were therefore arrived at by estimating the percentage open sky when the trees would be in full leaves. This converted estimate was found to give a better indication of the forest health or utilisation since trees and shrubs have a great ability to utilise sunshine by closing "shoulders" rapidly during the rainy seasons. However, this method has its weaknesses since water, soil fertility and fire frequency are also relevant, as is seen on the open African savannahs. The average canopy cover varied between the four sites with Phalombe having the highest cover (61%) constituted by the fairly homogeneous miombo woodlands. Ntchisi had the lowest canopy cover (28%), due to heavy disturbance by fire and fuel collection. The Mulanje transect canopy cover is dominated by the mature eucalyptus plantation.

Table 2 presents the average canopy closure, ground cover, natural regeneration and tree volume of all four areas:

***Table 2: Average canopy closure, ground cover, natural regeneration and tree volume***

| Audit area | Canopy cover % | Ground cover % | Regenerants (number/ha) | Tree volume ($m^3$/ha) |
|---|---|---|---|---|
| 1. Ntchisi | 28 | 48 | 500 | 24 |
| 2. Nkhotakota | 44 | 48 | 575 | 168 |
| 3. Phalombe | 61 | 56 | 850 | 74 |
| 4. Mulanje | 50 | 31 | 0 | 627 |

### *3.4.3 Standing tree volume*

Standing tree volume, like the canopy cover, ground cover and number of regenerants were computed on a plot-by-plot basis (using the study-mapped "plots" described in Annex 1, rather than the specific "plots" owned by particular owners). The most relevant data from the baseline perspective are the values in each plot, since variations are large. The table above shows average figures for each transect (areas under sustainable agriculture are excluded).

Standing tree volume computations were based on estimates rather than exact measurements, due to budget and time limitations. Estimates within each plot were derrived by counting the number of trees with a diameter at breast height between 5 and 10 cm, followed by all trees between 10 and 20 cm, and finally all those at or above 20 cm. The average useable height in each class was estimated, and the volume calculated based on simple volume calculations. The standing volume per plot was multiplied by 10 to obtain tree volume per hectare. For example, if there were n trees in the 10-20 cm diameter class on the plot (average 15cm), with an average useable height of h meters, the formula used was $(r \times r \times \pi \times h) \times n \times 10$. No dendrometer or relascope was available to aid in calculating basal area.

The Mulanje transect had the highest standing tree volume of 627 $m^3$/ha, due to the mature eucalyptus plantation covering three of the four plots. In the Nkhotakota transect most areas were covered with larger diameter miombo trees which also had considerable volume (168 $m^3$/ha), since these plots were within a less disturbed part of the Ntchisi Forest Reserve.

In Phalombe, the transect line went through fairly homogenous miombo woodland, and was thinly stocked in the plots closest to the villages. This transect's average per hectare and volume (74$m^3$) were both rather low, because all larger diameter trees (above 10 cm dmbh) had been cut by charcoal burners. The remaining standing tree volume is composed of shrubs, regenerants and stunted trees.

In the Ntchisi transect, most of the plots studied were areas recovering from subsistence agriculture (characterised by re-growth of young trees) or were community woodlands that had been overused and burnt. The average volume was estimated at only 24$m^3$/ ha.

### *3.4.4 Natural regeneration*

The Phalombe transect line had the highest number of regenerants, averaging 850 per hectare. There was dense regeneration at the Phalombe line, mainly because larger trees had been selectively cut for charcoal, and regenerants were coming up in the opened patches. The forest may regenerate rapidly if charcoal burning and fuel wood collection is curbed. However, charcoal producers appear to be utilising ever-smaller tree diameters, preventing trees from growing bigger.

Along the Ntchisi transect, the plots were sometime laid in dense grasslands (characterised by frequent fires) or in evergreen forest patches (in which the undergrowth was dominated by dense climbers and thick undergrowth). The density of regenerants in Ntchisi and the Nkhotakota plots were 500 and 575, respectively. Most of the Mulanje plots were under eucalyptus plantation, whose crowns were touching, so that only a few shade-tolerant plants could survive. Moreover, farmers clearing these areas for illegal cultivation, were destroying any regenerant growth. Hence, no regenerants at all were recorded in Mulanje.

### *3.4.5 Ground cover*

The average ground cover (see Table 2 above) of vegetation in the forest plots, was estimated on the basis of percentage of visible soil or rock. Most of the areas in

Ntchisi and Nkhotakota were burnt over, exposing a high percentage of uncovered soil and ashes. Phalombe had a larger portion of ground cover, mainly because the transect areas had not been burnt over. Mulanje had the least ground cover, as a result of cultivation of agricultural crops between the tree stems.

### *3.4.6 Human disturbance within forest reserves*

The high level of population pressure in rural areas of Malawi is contributing greatly to the encroachment onto the forest reserves. In Mulanje, the population pressure was highest in the rand zones between the tea plantations and the higher mountain areas. In the upper part of the Nkhotakota reserve, encroachment was regulated, while in the lower parts, people have open access for fuel-wood collection in the forest reserve. There was pronounced evidence of human disturbance of natural resources in all the forest and community reserves. The most common human disturbance was unregulated fires. A high level of illegal logging for fuel-wood (especially charcoal and firewood) and construction materials was also observed. Anthropogenic activities have shaped the landscapes and continue to modify the ecosystems. Most rural people and peri-urban dwellers depend on forest/woodland resources for energy and fertile agricultural soils for their livelihood.

Uncontrolled fires occur regularly in Nkhotakota and Ntchisi. Fire is one of the important ecological factors affecting miombo. The prevailing dry climate and highly flammable biomass from drying annual grasses and deciduous trees propel the frequency of fires, which are very damaging to seedlings and fire-intolerant species.

Illegal logging for fuelwood, construction poles and timber was rampant in Phalombe with more than 80% of the areas being cut. In Mulanje, communities wantonly remove bark to deliberately kill eucalyptus trees and also fell pine trees, to clear land for agriculture. In a very short while the eucalyptus and pine plantations – planted as buffer zones – will be cleared or killed. The most severe human disturbance in the forest were logging and fires, which together effected 100% of the land area studied along the transect lines in Phalombe, 62% in Nkhotakota and 50% in Ntchisi. A further 30% of the area studied in Ntchisi was affected by cultivation and fuelwood collection. Encroachment, including logging, affected 50% of the areas in Mulanje. There is high likelihood that the local population will encroach further onto the forest reserve seeking fertile soils or forest products, unless a stricter regulatory regime is adopted and enforced.

### *3.4.7 Soil texture, sloping gradient and erosion*

The dominant soil textural class is loam, clay loam or sandy loam, which together constitute about 82% of the top-soils. Most of the top soils (especially in protected areas) are mature and enriched with some humus.

Erosion is currently a problem in the hilly regions of Malawi, exacerbated by inadequate land-use technology – bush clearing, frequent wildfires and a low level of terracing. Erosion on the plots was classified as “high” (where deep gullies had formed and tree roots where exposed on steep slopes), “moderate” (in undulating terrain where there were signs of gully erosion created during rainy seasons); or “low” (in relatively flat terrain, represented by some sheet erosion).

The slopes along the Ntchisi transect line were generally too steep to permit any sustainable agricultural activities without soil erosion control measures. The study team registered abandoned agricultural plots along the line, where soil erosion had caused the bedrock in large patches to be exposed. However, many of these areas had returned to woodland and were slowly being reclaimed by bush encroachment. Many of the audited areas were only suitable for forestry or conservation, because of the high sloping gradient. The gradient was the highest in Mulanje, where soil conservation measures to contain erosion would be exorbitantly expensive, highly technical and too labour intensive for an average farmer. Soil erosion will be a big problem here once the eucalyptus plantation is gone and subsistence agriculture has been practised for a few years on the slopes. The Phalombe and the Nkhotakota transect areas had moderate-to-light sheet erosion only.

*Picture 1: Ring debarking in eucalyptus plantation within Mulanje Mountain Forest Reserve.*

*Picture 2: Maize plantation within Mulanje Mountain Forest Reserve*

*Picture 3: Maize field within partially cleared eucalyptus and pine plantation within Mulanje Mountain Forest Reserve*

Malawi is seen to have a good network of rivers, most of which are perennial (GoM, 2005). However, clearance of natural vegetation for agriculture, deforestation, and unsustainable irrigation practices along river banks have caused many rivers to silt and/or dry up. Still, the study team found that most of the plots (46%) were close to perennial rivers or streams, in spite of the prevailing dry hot weather conditions. Mulanje Mountain constitutes an important watershed, feeding several rivers. Water retention capacity and stream-flow regulation depend almost entirely on the health of mountain ecosystems.

Many signs of smaller wild animals were found on most of the plots audited in the forest reserves (53.6%). Hoof or foot marks and droppings were scattered in the plots. The percentage of plots in which animal marks were discerned were: Ntchisi 25, Nkhotakota 100, Phalombe 62.5 and Mulanje 30. The hare was the most common animal whose droppings were observed, followed by the forest duiker, klipspringer and a variety of rodents.

### *3.4.8 Secondary land use of areas*

More than 60% of the audited plots had no other extractive off-take from the forests apart from fuel. The second most prominent extractive activity was the collection of thatching grass (about 25% of the areas). Thatching grass is of vital importance as roofing material since most rural people cannot afford to buy iron sheets. Bamboos for roofing had been collected from about 7% of the plots, especially along the Phalombe transect. Honey gathering was taking place in Nkhotakota, but at a far lower level than the existing potential. This could be a major improvement area, which is also compatible with the conservation objectives for the reserves.

However, the most essential function of reserves is their provision of essential environmental services, especially the stabilisation of climate, including floods and

protection of soils. More than 70% of the areas had no indication of management, without considering the subsistence agriculture, fire-wood collection and charcoal burning in the areas. This lack of management seems to result mainly from the fact that no co-management arrangements had been put in place between the Forest Department and the surrounding communities. The villagers indicated very little interest in cooperation with the forest authorities. To a limited extent, the Ntchisi Forest Reserve has been used for ecotourism and also functioned as an important water catchment area. A limited practice of irrigation of tobacco seedlings and grazing was being practiced in Nkhotakota.

### *3.4.9 Main findings from the environmental audits*

Increasing signs of distress on the natural resources are evident in all the four areas, contributing towards increased poverty of the adjacent villages. The Phalombe/Mulanje districts are under the heaviest pressure for commercial charcoal production to supply urban centres like Blantyre. The management regime of Mulanje forest reserve is somewhat better than the Ntchisi forest reserve, and the forest reserve boundary is seemingly better protected, even as illegal charcoal burning inside the forest reserve is intense and seems to be gradually increasing. Mulanje/Phalombe area seems to have a better potential for management of forest resources, tourism and local energy needs. The illegal harvesting trend seem to be somewhat stabilizing in the most accessible areas, while becoming more serious in the remoter parts of the reserve. There are more resource options in this region to absorb the increasing population. The socio-economic village and household survey are providing more detailed data on these issues.

# 4. Socio-Economic and Demographic Characteristics

## 4.1 Size of Household Population, Characteristics of Head

As is elaborated in Annex 2, the socioeconomic data in this report are based on 20 community questionnaires and 616 household interviews—between 149 and 163 in each of the four districts.

The 2008 Population and Housing Census Preliminary Report found that 52.4% of the total population of Malawi were below 18 years of age)[4]. Within the samples of this survey 84% of the heads of households fall between the 15 and 59 years-of-age groups (see Table 3). Only 16% of the heads of households are older than 60 years of age. The Nkhotakota sample has a much smaller proportion of household heads above 60 years of age than the other districts. The total population of the households interviewed in the four districts are 2894.

Gender distribution in the sample is almost similar to the distribution arrived at by the 2008 Population and Housing Census Preliminary Report at both national and district levels (see table 4 below). There are slightly more females than males (52:48). Table 3 below presents the various characteristics of household heads, as the main influencing person within a household. About two thirds of the households in the sample are headed by men and 33.1% headed by women. The proportion of females is above the national average of 22.9%, according to the 2005 Integrated Household Survey. Also as shown in Table 3, more than 40% of the sampled households in Mulanje and Phalombe are headed by women. Widows in Mulanje and Phalombe account for 22 and 20% of the sampled households compared to only 9 and 15% in the sampled areas in Nkhotakota and Ntchisi districts, respectively. The two southern districts fall within a matrilinear inheritance system in southern Malawi; this constitutes another reason for the high frequency of women-headed households in the study. The average household size in the survey is 5 persons. This compares with the findings from the Integrated Household Survey (IHS) where the mean household size is 4.5 persons per household across the country with rural households having the mean household size of 4.6 persons and 30% of households having 6 or more persons (NSO, 2005, p. 13).

The majority of household heads (58%) are married under monogamous family arrangements. In sampled areas in Nkhotakota and Ntchisi, 15% and 17% (respectively) of married families are polygamous compared to only 1% and 3% in Mulanje and Phalombe districts. This partly explains the higher percentage of households

4 NSO estimates show that 6,216,427 people are aged 18 years and above

that are headed by women compared to Central Malawi. Single-headed households are highest in Nkhotakota (5.5%). Christianity is the dominant religion among household heads (92%).

***Table 3: Characteristics of household heads by districts (%)***

| Characteristics | Nkhotakota % | Ntchisi % | Mulanje % | Phalombe % | Total % |
|---|---|---|---|---|---|
| **Gender of household head** | | | | | |
| Male | 76.1 | 73.2 | 59.2 | 58.6 | 66.9 |
| Female | 23.9 | 26.8 | 40.8 | 41.4 | 33.1 |
| **Age group** | | | | | |
| 15 – 45 years | 68.1 | 62.4 | 53.3 | 56.6 | 60.2 |
| 45 – 60 years | 20.9 | 21.5 | 26.3 | 26.3 | 23.7 |
| >60 years | 11.0 | 16.1 | 20.4 | 17.1 | 16.1 |
| **Marital status** | | | | | |
| Never married | 5.5 | 4.0 | 4.6 | 4.6 | 4.7 |
| Married (monogamy) | 60.7 | 55.7 | 59.2 | 57.9 | 58.4 |
| Married (polygamy) | 16.6 | 15.4 | .7 | 2.6 | 8.9 |
| Separated | 3.1 | 4.7 | 6.6 | 5.9 | 5.0 |
| Widowed | 8.6 | 14.1 | 21.7 | 20.4 | 16.1 |
| Cohabite | | | | .7 | .2 |
| Divorced | 5.5 | 6.0 | 7.2 | 7.9 | 6.7 |
| **Highest education** | | | | | |
| Illiterate | 30.7 | 34.9 | 28.3 | 33.6 | 31.8 |
| Junior primary | 34.4 | 34.9 | 37.5 | 28.3 | 33.8 |
| Senior primary | 25.8 | 25.5 | 24.3 | 30.9 | 26.6 |
| Junior secondary | 6.7 | 2.0 | 3.9 | 5.3 | 4.5 |
| Senior secondary | 1.8 | 2.7 | 3.9 | 2.0 | 2.6 |
| Technical or higher | .6 | | 2.0 | | .6 |
| **Main occupation** | | | | | |
| Smallholder farmer | 99.4 | 98.0 | 78.9 | 92.1 | 92.2 |
| Wage labourer | .6 | | 15.1 | 3.3 | 4.7 |
| Business person | | .7 | 3.9 | 4.6 | 2.3 |
| None | | 1.3 | 2.0 | | .8 |

There is very little ethnic diversity among household heads. The Chewa tribe represented 50% in Nkhotakota and Ntchisi and more than 60% are from the Lomwe tribe in Mulanje and Phalombe. Across districts, male-headed households have larger families of between 3.6 and 7 persons per household compared to female-headed households that have between 2.3 and 5.8 persons per household. How-

ever, households in Nkhotakota and Ntchisi districts have relatively larger family sizes than those in Mulanje and Phalombe districts (see Table 4).

***Table 4: Household size by district and gender of household head***

| District | Household head | Number of members by age category | | | Sample Average number of members |
|---|---|---|---|---|---|
| | | 15-45 years | 45-60 years | >60 years | |
| Full sample | Male | 5.4 | 6.2 | 4.6 | |
| | Female | 4.3 | 4.2 | 2.8 | 5.0 |
| | Average | 5.1 | 5.4 | 3.6 | |
| Nkhotakota | Male | 5.5 | 6.6 | 4.6 | |
| | Female | 4.1 | 4.6 | 2.8 | 5.2 |
| | Average | 5.2 | 5.9 | 3.6 | |
| Ntchisi | Male | 5.7 | 7.0 | 3.6 | |
| | Female | 4.4 | 3.7 | 2.3 | 5.1 |
| | Average | 5.5 | 6.1 | 3.0 | |
| Mulanje | Male | 5.2 | 5.8 | 5.8 | |
| | Female | 4.2 | 3.9 | 2.6 | 4.7 |
| | Average | 4.9 | 5.0 | 3.9 | |
| Phalombe | Male | 5.1 | 5.3 | 4.4 | |
| | Female | 4.4 | 4.5 | 3.4 | 4.7 |
| | Average | 4.8 | 4.9 | 3.8 | |

# 5. Social Development

## 5.1 Education

According to the Integrated Household Survey (IHS 2004-2005), about 64 per cent of the population in Malawi are literate. This study concluded that 34 per cent of the household heads have only junior-level primary education. Of the current school-age population, there were no major disparities in education between boys and girls. According to the current study, Ntchisi had the largest number of children attending kindergarten (26%), while the corresponding estimate for Phalombe was only one percent (1%). On average for the four district samples, 82% of boys and 81% of girls were attending primary school, while the attendance was about 10% lower in the Ntchisi sample. About 6% of boys and 5% of girls were attending secondary school. There were slightly more boys than girls in each district.

***Table 5: School attendance by gender and grade (in %)***

| District name | School category | Boys | Girls |
|---|---|---|---|
| Full sample | Kindergarten | 11.1 | 12.5 |
| | Primary | 81.9 | 81.4 |
| | Secondary | 6.9 | 5.9 |
| | Total (%) | 100.0 | 100.0 |
| | Number in Sample | 360 | 376 |
| Nkhotakota | Kindergarten | 10.9 | 12.4 |
| | Primary | 82.2 | 81.9 |
| | Secondary | 6.9 | 5.7 |
| | Total (%) | 100.0 | 100.0 |
| | Number in Sample | 101 | 105 |
| Ntchisi | Kindergarten | 24.0 | 26.0 |
| | Primary | 71.2 | 68.0 |
| | Secondary | 4.8 | 6.0 |
| | Total | 100.0 | 100.0 |
| | Number in Sample | 104 | 100 |

| District name | School category | Boys | Girls |
|---|---|---|---|
| Mulanje | Kindergarten | 4.1 | 7.7 |
| | Primary | 89.2 | 86.8 |
| | Secondary | 6.8 | 5.5 |
| | Total (%) | 100.0 | 100.0 |
| | Number in Sample | 74 | 91 |
| Phalombe | Kindergarten | 1.2 | 1.3 |
| | Primary | 88.9 | 91.3 |
| | Secondary | 9.9 | 6.3 |
| | Total (%) | 100.0 | 100.0 |
| | Number in Sample | 81 | 80 |

The cited reason why children does not attend or drop out of school were refusal by the child (38.1%), sickness/disability or hunger (9.3%), high cost of education (8.5%), early pregnancy (6.8%), distance to school (5.1%) and refusal by parents (5.1%) (see Table 6).

***Table 6: Reasons for non-attendance or drop-out of school (% of responses)***

| Reason for dropping out of (or not attending) school | Nkhotakota | Ntchisi | Mulanje | Phalombe | Total |
|---|---|---|---|---|---|
| Sickness/Disability | 4.2 | 13.2 | 6.3 | 20.8 | 11.0 |
| Orphan - No support | 8.3 | 5.3 | 15.6 | 8.3 | 9.3 |
| Household chores | 8.3 | 5.3 | .0 | 4.2 | 4.2 |
| Refusal by parents | 4.2 | 5.3 | .0 | 12.5 | 5.1 |
| Refusal by child[5] | 37.5 | 39.5 | 43.8 | 29.2 | 38.1 |
| School too far | 8.3 | 2.6 | 6.3 | 4.2 | 5.1 |
| Hunger | 8.3 | 5.3 | 12.5 | 12.5 | 9.3 |
| Too expensive | 12.5 | 18.4 | .0 | .0 | 8.5 |
| No descent clothes/uniform | .0 | .0 | 6.3 | 4.2 | 2.5 |
| Early pregnancy | 8.3 | 5.3 | 9.4 | 4.2 | 6.8 |
| Total (%) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Number of responses (N) | 24 | 38 | 32 | 24 | 118 |

In Mulanje and Phalombe, orphanage (lack of family support), hunger and sickness also feature highly as reasons for dropping-out. In Nkhotakota, 8.3 percent of the households stated that sometimes children are forced out of school in order to help parents with household chores. This percentage was lower in the other districts;

5 Refusal by the child is consistently a major reason across districts as often parents are themselves illiterate. As such they do not appreciate the value of encouraging their children to go to school. The high number attributed to this factor may also constitute an excuse by parents during interviews.

however it is common during the agricultural peak season that children help their parents with weeding, fertiliser application and plucking of tobacco leaves.

## 5.2 Health and Hygiene

### *5.2.1 Access to health services*

Almost all the households had at least one member who had been sick or injured/attacked during the last year. As at the national level, malaria is the single-most cause of morbidity in the sample, followed by air-borne and water-borne diseases.

Table 7 below shows that the disease pattern varies slightly across the districts. Diseases of the eye, airborne diseases, hunger-related diseases and typhoid are most frequent in Nkhotakota, waterborne diseases are most frequent in Ntchisi, accidents/attacks and HIV/AIDS are most frequent in Phalombe; and sexually transmitted diseases (STI) are most frequent in Nkhotakota and Mulanje.

The baseline survey also gathered information on health-care seeking behaviour of the households. For most diseases the large majority of the households (80-90%) sought modern medical treatment when they fell sick[6]. The attendance to modern practitioners was even higher for sexually transmitted diseases. Other remedial measures include buying medicine, consulting traditional healers and seeking help from relatives.

***Table 7: Types of diseases affecting household members by district***

| Description | Whether a household member suffered from disease(s) | Nkhotakota (%) | Ntchisi (%) | Mulanje (%) | Phalombe (%) | Total (%) |
|---|---|---|---|---|---|---|
| Eye disease | Yes | 49.7 | 34.0 | 25.0 | 17.2 | 31.7 |
| | No | 50.3 | 66.0 | 75.0 | 82.8 | 68.3 |
| | **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| Airborne disease | Yes | 68.7 | 68.5 | 51.3 | 54.3 | 60.8 |
| | No | 31.3 | 31.5 | 48.7 | 45.7 | 39.2 |
| | **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| HIV and AIDS | Yes | 2.6 | 1.3 | .7 | 4.0 | 2.1 |
| | No | 97.4 | 98.7 | 99.3 | 96.0 | 97.9 |
| | **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| Waterborne disease | Yes | 42.9 | 47.7 | 39.5 | 25.2 | 38.8 |
| | No | 57.1 | 52.3 | 60.5 | 74.8 | 61.2 |
| | **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| Hunger-related disease | Yes | 11.6 | 9.5 | 3.3 | 7.3 | 8.0 |
| | No | 88.4 | 90.5 | 96.7 | 92.7 | 92.0 |
| | **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

6 This could be private or government hospitals or clinics

| Description | Whether a household member suffered from disease(s) | Nkhotakota (%) | Ntchisi (%) | Mulanje (%) | Phalombe (%) | Total (%) |
|---|---|---|---|---|---|---|
| Sexually transmitted disease | Yes | 1.3 | .7 | 1.3 | .7 | 1.0 |
| | No | 98.7 | 99.3 | 98.7 | 99.3 | 99.0 |
| | **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| Malaria | Yes | 88.8 | 90.5 | 85.5 | 83.4 | 87.1 |
| | No | 11.3 | 9.5 | 14.5 | 16.6 | 12.9 |
| | **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| Typhoid fever | Yes | 25 | 0 | 18.0 | 0 | 6.2 |
| | No | 75.0 | 100.0 | 82.0 | 97.8 | 93.8 |
| | **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

Although most households seek medical treatment, the frequency is lower for those living far away from a health facility. Households in Nkhotakota and Ntchisi travel relatively longer distances to access a medical facility than households in Mulanje and Phalombe. Health facilities in Mulanje and Phalombe are located in densely populated areas that are easily accessible by the majority of households, while households in Nkhotakota and Ntchisi on average reside at the distance of 9.4 and 5.7 km, respectively, from the facility. The proportion of households that seek medical help from the health facilities is lowest in Mulanje (70%), despite the relatively shorter average distance to medicinal facilities.

The services provided in health facilities in Mulanje and Phalombe districts are rated as good by 55.8% and 60.2% of the households, as compared to 43% and 39%, respectively, of the sampled households in Nkhotakota and Ntchisi. The majority of households buy medicines from shops when sick instead of seeking medical help from health facilities.

### *5.2.2 Access to safe water*

Concerning availability of water, only 52% of the households in the sample of 581 households have access to safe potable water. Across districts, Nkhotakota and Ntchisi have the highest percentage (respectively 76% and 62%), while only 37% of the households in Mulanje and Phalombe have such access. Households in Nkhotakota, Ntchisi and Mulanje travel relatively longer distances (1.0 km) to the water collection points, compared to those in Phalombe (0.3 km).

Most households in the sample (91%) possess pit latrines. Phalombe households have the highest proportion with latrines (93%), and Ntchisi the lowest (89%). This may be one reason why the Ntchisi district has the highest incidence of waterborne diseases (48%).

*Table 8: Access to safe water*

| Access to safe water | Nkhotakota | Ntchisi | Mulanje | Phalombe | Total |
|---|---|---|---|---|---|
| Yes (%) | 76.3 | 62.6 | 37.5 | 37.1 | 52.5 |
| No (%) | 23.7 | 37.4 | 62.5 | 62.9 | 47.5 |
| Total (%) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Sample (N) | 131 | 147 | 151 | 151 | 581 |
| **Distance to safe water** | | | | | |
| Distance (km) | 1.10 | 1.12 | 0.83 | 0.30 | 0.90 |
| Std. Deviation (km) | 0.63 | 0.71 | 0.70 | 0.26 | 0.65 |
| Sample (N) | 97 | 88 | 55 | 57 | 297 |

### *5.2.3 Health education*

On average, 77% of the households reported that they had access to health education. By districts the proportion of sampled households with highest access to health education is Nkhotakota (89.9%), while Mulanje—which has a high proportion of tea estate workers— has the lowest proportion (66%).

Among households that have access to health education, the services provided are considered good or excellent by more than 80%. On this matter, however, there are considerable variations between the districts. In Nkhotakota and Ntchisi, about a third of the households characterise their access to health education as “poor” or “very poor”.

### *5.2.4 Housing characteristics*

Most of the households have dwelling houses. The baseline study collected data on the conditions of each household’s main dwelling house and other structures. Table 9 presents the various characteristics of the main dwelling house and housing materials. Most households live in traditional houses with mud walls (46%) and grass-thatched roofs (80%). Ntchisi has the highest proportion of houses with mud walls (94%) and grass-thatched roofs (95%). Regarding house size, the highest proportion of the respondents (43%) had houses of 10–20 sq. meters. Mulanje and Phalombe have the highest proportion of houses above 20 sq. meters (39%) in size.

Modern houses with walls made of burnt bricks constitute 27% of the four samples, as do those with walls made of unburned bricks (27%). The highest proportion of unburned bricks is in Mulanje (52%) and the highest proportion of burnt bricks is in Nkhotakota (42%). Modern houses with roofs with corrugated iron sheets constitute 20%. Mulanje and Phalombe have the highest proportions of houses with corrugated iron sheets roofs (47 and 22%, respectively ).

Most of the houses had a dining room and/or lounge (84%), with the highest proportion in Mulanje (90%). Few houses had windows (20%);the highest proportion is in Ntchisi (38%). Across districts, most windows were made of wood (46%); the highest proportions are in Mulanje and Phalombe (48%). Windows with glass

material were most common in Phalombe (32%). Nkhotakota was the district with the highest proportion of houses without glass windows (88%). It was also the district having the highest incidence of airborne diseases. Most of the houses have wooded doors (91%); the highest proportion is in Mulanje (99%). Households in Nkhotakota and Ntchisi had the highest proportions of houses with doors made of straw (17% and 10%, respectively).

***Table 9: Housing quality of households by district***

| Dwelling house characteristic | Nkhotakota (%) | Ntchisi (%) | Mulanje (%) | Phalombe (%) | Total (%) |
|---|---|---|---|---|---|
| **Size of house(sq m)** | | | | | |
| <10 sq meters | 25.2 | 15.4 | 21.1 | 17.1 | 19.8 |
| 10 - 20 sq meters | 39.3 | 47.7 | 40.1 | 44.1 | 42.7 |
| > 20 sq meters | 35.0 | 34.9 | 38.8 | 38.8 | 36.9 |
| **Dining/Lounge** | | | | | |
| With | 80.4 | 80.5 | 89.5 | 84.9 | 83.8 |
| Without | 19.6 | 19.5 | 10.5 | 15.1 | 16.2 |
| **Windows** | | | | | |
| With | 17.8 | 37.6 | 10.5 | 15.1 | 20.1 |
| Without | 82.2 | 62.4 | 89.5 | 84.9 | 79.9 |
| **Window material** | | | | | |
| Glass | 12.0 | 15.1 | 26.5 | 32.0 | 21.8 |
| Wood | 43.6 | 43.0 | 48.5 | 48.4 | 46.1 |
| Straw | 32.3 | 34.4 | 6.6 | 7.8 | 19.2 |
| Other specify | 10.5 | 5.4 | 17.6 | 10.2 | 11.4 |
| **Door material** | | | | | |
| Wood | 81.6 | 87.9 | 98.7 | 96.1 | 90.9 |
| Straw | 17.2 | 10.7 | .7 | 2.6 | 8.0 |
| **Wall material** | | | | | |
| Mud | 44.8 | 94.0 | 21.1 | 24.3 | 45.8 |
| Unburned bricks | 11.0 | 1.3 | 52.0 | 42.1 | 26.5 |
| Burned bricks | 41.7 | 4.7 | 27.0 | 32.2 | 26.8 |
| **Roofing material** | | | | | |
| Grass thatched | 93.9 | 95.3 | 53.3 | 77.6 | 80.2 |
| Iron sheets | 5.5 | 4.7 | 46.7 | 21.7 | 19.5 |
| Tiles | 0.6 | | | 0.7 | 0.3 |

# 6. Economic Characteristics

## 6.1 Livelihood Sources

Agriculture, which represented over 70% of the main occupation of the sampled households, is by far the most important source of living (see Table 10). In Nkhotakota and Ntchisi, more than 80% of the households rely on agriculture as their main source, compared to only 63% in both Mulanje and Phalombe. Wage employment accounts for 16% of the total sample. Casual labour is an important source of livelihood especially on the tea estates in Mulanje (24%) and Phalombe (17%). Forestry operations constitute another important source for households in Phalombe. Businesses, especially in forest products, are an important source in Phalombe and Mulanje. Across all districts, growing crops is by far the most important agricultural activity—especially maize, groundnuts, tobacco and cassava. Whilst maize is the major crop in Ntchisi (21%) and Phalombe (17%), groundnuts and tobacco are respectively major sources in Nkhotakota (33%) and Mulanje (24%).

***Table 10: Main sources of livelihoods for households by districts (in %)***

| Source of livelihood | Nkhotakota | Ntchisi | Mulanje | Phalombe | Total |
|---|---|---|---|---|---|
| Agriculture | 82 | 80.1 | 63.2 | 63.5 | 70.7 |
| *Crops farming* | 72.8 | 61.0 | 52.9 | 53.0 | 58.2 |
| *Livestock rearing* | 9.2 | 19.1 | 10.3 | 10.5 | 12.5 |
| Forestry | 4.4 | 2.6 | 1.4 | 8.3 | 4.3 |
| Business | 3.4 | 5.3 | 10.0 | 10.0 | 7.7 |
| Remittances | .5 | 1.2 | 1.1 | 1.7 | 1.2 |
| Employment (including piece work - ganyu) | 8.3 | 10.6 | 24.0 | 16.5 | 15.7 |
| Other (e.g. leasing land) | 1.5 | 0.3 | 0.3 | | 0.4 |
| Total (%) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Sample (N) | 163 | 149 | 152 | 152 | 616 |

## 6.2 Household Expenditure

Analysis of household expenditure patterns is key to determining the welfare levels of households (NSO, 2005). Annual expenditures on various commodities across the four districts range from MK13304.87 (USD 80) to MK14811 (USD 105)[7] (see Table 11 below). The average annual expenditure is estimated at MK13057.57 (USD 93.27) and per capita expenditure is MK2614.13 (USD 18.67). However, the average expenditure among sampled households in Mulanje is the highest (MK16367.92 or USD 116.91). Invariably across all districts, the average annual expenditures differ by gender of household. Annual expenditures for male-headed households are significantly higher than for female headed ones (P<0.000), with the exception of Phalombe, where the mean difference between the two groups is substantial, but not significant statistically (P=134).

***Table 11: Total household expenditures in the study areas***

| District | Gender of household head | Mean income In MK and (USD) | Std. Deviation In MK and (USD) | N |
|---|---|---|---|---|
| Nkhotakota | Male | 14376 (103) | 27042 (193) | 119 |
| | Female | 6748 (48) | 7094 (51) | 37 |
| | Total | 12567 (90) | 24062 (172) | 156 |
| Ntchisi | Male | 14085 (101) | 21855 (156) | 103 |
| | Female | 7868 (56) | 12635 (90) | 38 |
| | Total | 12410 (89) | 19946 (142) | 141 |
| Mulanje | Male | 21990 (157) | 30520 (218) | 90 |
| | Female | 8072 (58) | 8590 (61) | 61 |
| | Total | 16368 (117) | 25088 (179) | 151 |
| Phalombe | Male | 12226 (87) | 15946 (114) | 89 |
| | Female | 8963 (64) | 18573 (133) | 63 |
| | Total | 10874 (78) | 17101 (122) | 152 |
| Total | Male | 15533 (110) | 24770 (177) | 401 |
| | Female | 8069 (58) | 13037 (93) | 199 |
| | Total | 13058 (93) | 21869 (156) | 600 |

This study also sought to establish the patterns of household expenditures in the study areas. The household expenditure pattern is presented in Table 12.

7 The exchange rate used here is MK140 =1USD.

***Table 12: Proportion of household expenditure***

| Expenditure item | Nkhotakota (%) | Ntchisi (%) | Mulanje (%) | Phalombe (%) | Total (%) |
|---|---|---|---|---|---|
| Food | 22.6 | 27.8 | 33.9 | 30.7 | 28.5 |
| Buying farm inputs (fertiliser & seeds) | 29.2 | 28.1 | 23.4 | 28.9 | 27.5 |
| Medicines (including consultation fees) | 23.8 | 23.0 | 22.8 | 16.9 | 21.8 |
| Village contributions | 11.3 | 12.2 | 10.4 | 9.0 | 10.8 |
| Fuel wood | 2.9 | 2.0 | 3.6 | 4.0 | 3.1 |
| Bed nets | 1.9 | 2.8 | 1.2 | 2.7 | 2.1 |
| Gifts | 1.9 | 1.3 | 2.2 | 1.2 | 1.7 |
| Firewood | 2.5 | 1.8 | 0.5 | 0.5 | 1.4 |
| Renting land | 2.7 | 0.5 | 0.2 | 1.5 | 1.3 |
| Others (e.g., health & sanitation, potable water) | 1.3 | 0.4 | 1.7 | 4.6 | 1.9 |
| Total | 100 | 100 | 100 | 100 | 100 |

Household expenditures on food account for nearly one-third of total household expenditure in the study areas. The share on food is higher among households in both Mulanje and Phalombe than in Nkhotakota or Ntchisi. The high proportion spent on food implies that households either do not harvest enough from their own fields or they sell food at harvest time, only to buy later on.

Other major expenditure items are farm inputs (fertiliser and seed) and medicines, which account for 27.5% and 21.8% of total household expenditures, respectively. To maintain social networks, households make village contributions for development activities or for other purposes. This accounts for a tenth of household expenditures across all districts.

It is worth noting that most expenditure decisions are made by men. Of particular interest investigated in this study regarding decision making were decisions on health and sanitation, food items, agricultural production and social contributions. The study shows that invariably, the head of household makes 80-95% of the major household expenditure decisions on items like farm inputs, medicines and food.

## 6.3 Household Asset Ownership and Control

In general, ownership of household and productive assets is indicative of level of welfare. Ownership of productive assets is low in the sample. Apart from basic productive assets (hoes and axes), very few households own ploughs, ridgers or ox-carts. Even ownership of basic household assets is limited. For example, about 11% of the households in the sample own a bicycle. Even furniture like chairs and beds are rare in many of the homes.

There are significant differences in asset ownership between male- and female-headed households related to several items. While 15% of male-headed households own radios, only 0.5% of the female-headed households do. No female-headed household across the four districts owned bicycles, ploughs/ridgers, fishing nets or motorcycles.

In terms of control of assets, the study shows that if a household owns high-value assets, the power to regulate their use is vested in the husband (in male-headed households). Rarely do female-headed households in the sample own such assets. In female-headed households, the majority of assets are owned by women, although male children or relatives have the control over their use in some cases.

In some cases, wives have control over assets which might have been bought with their money or brought into the household from their original home. Wives in Nkhotakota and Ntchisi traditionally stay in their husbands' villages, and have less control over assets than in Mulanje and Phalombe, whose husbands move to the homes of their wives (matrilinier succession).

## 6.4 Livestock Ownership and Control

The study collected data on livestock ownership and control. As can be seen in Table 13, the ownership of livestock is very modest in the total sample of 616 households.

In Nkhotakota, the sample included only one household which owned beef cattle (4 heads). In Ntchisi, five households owned beef cattle (the mean number is 4). No households owned any cattle in Mulanje and Phalombe. The mean number of goats owned in each district is 3-5. However, the number of households owning goats is still quite small in each district sample of about 150 households (Nkhotakota 54, Ntchisi 79, Mulanje 54 and Phalombe 48). The most common livestock kept is the local chicken. The mean stocking rates in Nkhotakota and Ntchisi are 6 and 7 chickens per household, compared to 5 and 3 chickens in Mulanje and Phalombe, respectively. The total number of households owning chickens in each district ranged from 44 to 86, again with the two southern regions having the least.

***Table 13: Number of households owning livestock, the mean number of stock and standard deviations***

| District name | Livestock | No. of livestock-owning households | Mean number in the household | Standard Deviation |
|---|---|---|---|---|
| Nkhotakota | Beef cattle | 1 | 4.00 | . |
| | Goats | 54 | 4.07 | 2.971 |
| | Sheep | 3 | 4.00 | 3.000 |
| | Pigs | 19 | 4.05 | 3.118 |
| | Broiler chickens | 1 | 3.00 | . |
| | Layers chickens | 1 | 13.00 | . |
| | Local chickens | 86 | 7.00 | 5.285 |
| | Ducks | 1 | 2.00 | . |
| | Doves | 1 | 4.00 | . |
| | Other inc' turkey | 10 | 3.00 | 1.944 |
| Ntchisi | Beef cattle | 5 | 4.20 | 1.643 |
| | Goats | 79 | 5.20 | 4.008 |
| | Sheep | 1 | 1.00 | . |
| | Pigs | 4 | 4.75 | 4.992 |
| | Layers chickens | 3 | 3.33 | 1.528 |
| | Local chickens | 78 | 5.95 | 4.416 |
| | Ducks | 2 | 5.00 | 4.243 |
| | Doves | 1 | 10.00 | . |
| | Rabbits | 1 | 4.00 | . |
| Mulanje | Goats | 19 | 4.16 | 2.363 |
| | Local chickens | 54 | 4.69 | 3.700 |
| | Rabbits | 5 | 4.00 | 2.915 |
| | Other inc' Turkey | 2 | 2.50 | .707 |
| Phalombe | Goats | 48 | 3.27 | 1.723 |
| | Sheep | 1 | 3.00 | . |
| | Pigs | 11 | 2.09 | 1.446 |
| | Layers chickens | 2 | 3.00 | 1.414 |
| | Local chickens | 44 | 3.50 | 2.800 |
| | Ducks | 2 | 4.50 | .707 |
| | Doves | 2 | 14.00 | 1.414 |
| | Rabbits | 5 | 5.00 | 4.359 |
| | Other inc' Turkey | 1 | 1.00 | . |

Across the districts, about 60% of the livestock is controlled by the husbands in Ntchisi and Nkhotakota, while the percentage of livestock control by husbands is lower in Mulanje and Phalombe (43% and 50%, respectively). It is interesting to note that other persons besides the household members, (e.g., uncles) have control over goats and chickens across all districts.

## 6.5 Access to Credit

Household's access to various forms of credit is critical for economic empowerment. The study investigated (i) types of credit available in the study areas, (ii) the purpose for which each was obtained and (iii) its source. This information is presented in Table 14.

Out of the total 616 households sampled, only 83 (13.5%) households had accessed credit during the 2007/2008 season. These results are similar to the IHS (2005) findings which showed that 13% of the households had taken credit (at the time of data collection). Conversely another 13.5% of the respondents stated that they had never received a loan in their lives. Male-headed households had taken more credit than female headed households. In Nkhotakota, no female headed household had taken credit during the past 12 months.

***Table 14: Types of credit obtained by households (2007/2008) (%)***

| Type of credit | Nkhotakota | Ntchisi | Mulanje | Phalombe | Total |
|---|---|---|---|---|---|
| Cash | 75.0 | 100.0 | 60.0 | 70.6 | 74.7 |
| Farm inputs | 16.7 | | 25.0 | 14.7 | 14.5 |
| Business loan | 8.3 | | 15.0 | 14.7 | 10.8 |
| **Total (%)** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| **Source of credit** | | | | | |
| Commercial banks | | | | 5.9 | 2.4 |
| NGOs | 33.3 | | 30.0 | 44.1 | 30.1 |
| Friends/relatives | 58.3 | 76.5 | 50.0 | 23.5 | 45.8 |
| Government | 8.3 | | | 23.5 | 10.8 |
| Informal money lenders | | 23.5 | 10.0 | 2.9 | 8.4 |
| Unspecified | | | 10.0 | | 2.4 |
| **Total (%)** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| **Purpose of loan** | | | | | |
| Capital for business | 16.7 | 5.9 | 15.0 | 50.0 | 27.7 |
| Buying food | 66.7 | 76.5 | 65.0 | 29.4 | 53.0 |
| Buying inputs | 8.3 | 11.8 | 20.0 | 14.7 | 14.5 |
| Unspecified | 8.3 | 5.9 | | 5.9 | 4.8 |
| **Total (%)** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| **Sample (N)** | **12** | **17** | **20** | **34** | **83** |

The major sources of credit included friends/relatives, NGOs/CBOs and the government. Most borrowers had obtained cash. There were significant differences between male-headed households (12% of which had obtained agricultural credit) and female-headed households (23%). Other studies have established that female-headed households organised into groups are more likely to be given credit than their male counterparts. Such programs empower female-headed households to diversity their economic base and improve their livelihood.

In all the districts except Phalombe, more than 65% of the households obtained the loan to purchase food. In Phalombe, 50% of households obtained the loans to start-up businesses. Other households had used loans to purchase farm inputs. There are significant differences in the use of credit between male- and female-headed households. About 32% of female-headed households used their credit for purchase of food and inputs, and 6.4% for starting businesses. About 61% of the male-headed households reported using their credit to purchase food while 25% reported using it as start-up capital for businesses.

# 7. Natural Resources Endowment

## 7.1 Land Ownership and Use

The household survey examined the land ownership across the study areas and between male and female headed households, as shown in Table 15 below.

***Table 15: Average land size by gender of household head, distance from homestead (standard deviation in parenthesis)***

| District | Gender of household head | Number of plots | Total area in hectares | Distance from homestead in km |
|---|---|---|---|---|
| Nkhotakota | Male | 2.032<br>(0.987) | 2.067<br>(1.616) | 0.747<br>(0.800) |
| | Female | 1.711<br>(0.835) | 1.655<br>(1.744) | 0.637<br>(0.607) |
| | Group Average | 1.9568<br>(0.961) | 1.969<br>(1.652) | 0.721<br>(0.759) |
| | Group Sample | 163 | 163 | 163 |
| Ntchisi | Male | 1.606 | 1.846 | 0.617 |
| | | (0.817) | (1.347) | (0.822) |
| | Female | 1.2250 | 1.262 | 0.6204 |
| | | (0.480) | (0.734) | (0.854) |
| | Group Average | 1.5034 | 1.6889 | .6177 |
| | | (0.759) | (1.238) | (0.828) |
| | Group Sample | 149 | 149 | 149 |
| Mulanje | Male | 1.708 | 1.347 | 0.8376 |
| | | (0.815) | (1.326) | (0.889) |
| | Female | 1.672 | 1.058 | .6974 |
| | | (0.908) | (0.879) | (0.692) |
| | Group Average | 1.693 | 1.229 | 0.7806 |
| | | (0.851) | (1.170) | (0.815) |
| | Group Sample | 151 | 151 | 151 |

| District | Gender of household head | Number of plots | Total area in hectares | Distance from homestead in km |
|---|---|---|---|---|
| Phalombe | Male | 1.618 | 0.895 | 0.477 |
| | | (0.731) | (0.681) | (0.444) |
| | Female | 1.444 | 0.753 | 0.528 |
| | | (0.690) | (0.540) | (0.593) |
| | Group Average | 1.546 | 0.837 | 0.498 |
| | | (0.717 | (0.628) | (0.510) |
| | Group Sample | 152 | 152 | 152 |
| Full Sample | Male | 1.759 | 1.597 | 0.674 |
| | | (0.871) | (1.393) | (0.774) |
| | Female | 1.520 | 1.118 | 0.618 |
| | | (0.774) | (1.049) | (0.682) |
| | Sample average | 1.680 | 1.439 | 0.655 |
| | | (0.847) | (1.308) | (0.745) |
| | Full Sample | 615 | 615 | 615 |

The average plot size in the sample is estimated to be 0.65 ha. However, in all districts each household had on average more than one (1) plot, located within a kilometre of its homestead. The households in Nkhotakota and Ntchisi possess larger farms than those in Mulanje and Phalombe districts. The average farm size in Nkhotakota and Ntchisi is estimated at 1.98 ha and 1.6 ha, respectively. In Mulanje and Phalombe, the average farm sizes are 1.2 ha and 0.85 ha, respectively. Male-headed households possess larger farms than female-headed households.

## 7.2 Land Acquisition by Gender

The study established how the households had acquired their farms. Results show that 77% of the households inherited their land from their parents, while 13% received their land by allocation from local chiefs. Compared to males, the proportion of women acquiring land through inheritance is lower.

More than 40% of the female-headed households in Mulanje and Phalombe districts acquired their land through inheritance, compared to only 19% and 25% in the Nkhotakota and Ntchisi districts, respectively. This is consistent with the traditional property inheritance rules, since land in the Southern Region traditionally is passed on through the maternal line and husbands reside in the women's village. This contrasts with the practices in the Central Region of Malawi.

## 7.3 Soil and Water Conservation

In general, farmers adopt different soil and water conservation practices to reduce soil erosion, reclaim degraded land and maintain fertility. Such practices are promoted by government agricultural extension agents and NGOs. Table 16 shows the numbers and types of various soil and water conservation practices adopted by farmers in the study areas.

The most commonly used conservation practices in all districts are box ridges and contour ridges. Conservation farming is practiced only by a small minority (1%) in Nkhotakota and Phalombe. Due to rough terrains, most of the soil and water conservation practices take place on upland or hilly terrains in Ntchisi and Mulanje districts. The types of conservation practices used on steep slopes include box ridges, contour ridges or terraces, vetiver grass and tree planting. On the other hand, box ridges, compost manure and contour ridges are the commonly used conservation practices on flat land or plains. A few farmers in the sample plant on swampy areas or "dambos", with an average size of 0.9 hectare. Farmers with "dambos" in Nkhotakota and Phalombe use box ridges, mulching, vetiver grass and compost/manure.

***Table 16: Soil and water conservation practices by households***

| District | Soil and water conservation practice | Persons who report applying the practice | Practices by type of land (%) | | |
|---|---|---|---|---|---|
| | | | Upland/ hilly terrain (% ) | Wetlands (Dambo) (% ) | Flat land or plane (% ) |
| Nkhotakota | Box ridges | 121 | 49.6 | 4.1 | 46.3 |
| | Contour ridges/ terraces | 85 | 58.8 | 10.6 | 30.6 |
| | Compost manure | 16 | 0.0 | 6.3 | 93.8 |
| | Vetiver grass (Vetiveria zizanioides) | 13 | 53.8 | 0.0 | 46.2 |
| | Mulching | 1 | 0.0 | 100.0 | 0.0 |
| | Agro-forestry | 2 | 0.0 | 0.0 | 100.0 |
| | Conservation farming | 4 | 50.0 | 25.0 | 25.0 |
| | Other: specify (e.g. rotation) | 21 | 14.3 | 0.0 | 85.7 |
| Ntchisi | Box ridges | 52 | 88.5 | 1.9 | 9.6 |
| | Contour ridges/ terraces | 138 | 81.9 | 5.1 | 13.0 |
| | Compost manure | 7 | 100.0 | 0.0 | 0.0 |
| | Afforestation | 2 | 100.0 | 0.0 | 0.0 |
| | Vetiver grass | 3 | 66.7 | 0.0 | 33.3 |
| | Other specify (e.g. rotation) | 4 | 75.0 | 0.0 | 25.0 |

| District | Soil and water conservation practice | Persons who report applying the practice | Practices by type of land (%) | | |
|---|---|---|---|---|---|
| | | | Upland/ hilly terrain (% ) | Wetlands (Dambo) (% ) | Flat land or plane (% ) |
| Mulanje | Box ridges | 25 | 72.0 | 0.0 | 28.0 |
| | Contour ridges/ terraces | 152 | 83.9 | 6.5 | 9.7 |
| | Compost manure | 5 | 60.0 | 0.0 | 40.0 |
| | Vetiver grass | 11 | 90.9 | 9.1 | 0.0 |
| | Mulching | 2 | 0.0 | 50.0 | 50.0 |
| | Other specify (e.g. rotation) | 16 | 75.0 | 6.3 | 18.8 |
| Phalombe | Box ridges | 52 | 38.5 | 5.8 | 55.8 |
| | Contour ridges/ terraces | 105 | 70.5 | 2.9 | 26.7 |
| | Compost manure | 9 | 11.1 | 11.1 | 77.8 |
| | Afforestation | 3 | 33.3 | 0.0 | 66.7 |
| | Vetiver grass | 12 | 58.3 | 16.7 | 25.0 |
| | Conservation farming | 3 | 0.0 | 0.0 | 100.0 |

# 8. Agricultural Production

## 8.1 Crop Production

Crop production was a key issue in the study, including crops grown, size of area planted, amount of produce harvested and income from crop sales in the 2007/2008 cropping season. All households in all study areas grow maize, the main staple food crop for Malawi. Less than 3% of the households sampled cultivated open pollinated varieties (OPV) of maize. This compares to the finding reported by NSO, which showed that only 4.7% and 5.2% of households in Mulanje and Phalombe, respectively, grew OPV of maize (NSO, 2005).

A small proportion of households in Phalombe and Mulanje grew tobacco, while 10% of households sampled in Ntchisi and Nkhotakota were tobacco growers. Besides tobacco, farmers in both Nkhotakota and Ntchisi also grew groundnuts as a cash crop, while cassava was important among households in Mulanje, grown by nearly 20% of households. Although NSO (2005) states that 80% grow cassava in Nkhotakota, our sample for Nkhotakota did not capture cassava-growing households, having been drawn in upland areas where cassava is not commonly grown by farmers.

The size of the farm is another important determinant of which crops are grown. Nearly 73% of all cropping area involved farms less than 0.5 hectares in size, while another 19% were 0.5 - 1.0 hectares, and 6% were 1.0-2.0 hectares in size. The majority of all crops, except sugarcane, were grown on less than 0.5 hectares. To a much higher extent, the larger sized farms were used for cash crops such as sugarcane, tobacco, groundnuts, tea, pineapple and maize. The proportion of households growing crops on less than 0.5 hectares is higher in Mulanje and Phalombe than in Nkhotakota and Ntchisi.

Household harvests of major crops were generally very low; however, there were great variations across districts. For comparable crops like maize, tobacco and groundnuts the quantities harvested (in kg) by households are on average two to three times higher in Nkhotakota and Ntchisi than in Mulanje and Phalombe. However, the very low maize harvest (163 kg) in Mulanje is partly compensated by production of tea (217 kg), cassava (147 kg) and pineapple (1167 kg). In general, the lower quantities harvested in the Southern Region could be attributed to a combination of factors including farm sizes, high input prices and low soil fertility.

## 8.2 Income from Crop Sales

There were significant variations in the level of income realised from crop sales between male- and female-headed households and across districts. In general, average income to households from crop sales was lowest in Phalombe among all the districts. Further, the male-headed households in Nkhotakota and Ntchisi earned significantly higher crop income than female-headed households ($P<0.005$). The difference in income by gender of household head was much smaller within the Southern Region.

On average, 15.2% of male-headed households in Nkhotakota earn between MK 20,000 (USD 140) and MK80,000 (USD 570) while 9.2% of female-headed households get between MK10,000 (USD 70) and MK20,000 (USD 140) (see Table 17).

In Mulanje many male-headed households realised incomes from crop sales ranging from MK1,500 (USD 10) to MK20,000 (USD 140). The proportion of households in Mulanje who got between MK20,000 (USD 140) and MK80,000 (USD 570) is 3.9% and 3.4% for male- and female-headed households. In Phalombe, 7.6% and 6.8% of male- and female-headed households, respectively, earned between MK1,500 (USD 10) and MK3,000 (USD 20) from crop sales.

The difference in average income from crop sales across districts is mainly attributed to the diversity of crops grown. For example, most households in Nkhotakota and Ntchisi rely on tobacco, groundnuts and soybeans as their main cash crops. In Mulanje, tea and cassava are the main cash crops, while groundnuts and pulses are the main cash crops of households in Phalombe.

***Table 17: Income from crop sales by household (MK)***

| District name | Gender of household head | Mean in MK (and USD ) | Std. Deviation (MK and USD) | N |
|---|---|---|---|---|
| Nkhotakota | Male | 19462 (139) | 21711 (155) | 167 |
| | Female | 6474 (46) | 5019 (36) | 38 |
| | Total | 17054 (122) | 20341 (145) | 205 |
| Ntchisi | Male | 15042 (107) | 38128 (272) | 142 |
| | Female | 6131 (44) | 7059 (50) | 30 |
| | Total | 13487 (96) | 34909 (249) | 172 |
| Mulanje | Male | 15815 (13) | 26447 (189) | 66 |
| | Female | 12889 (92) | 22379 (160) | 27 |
| | Total | 14966 (107) | 25248 (180) | 93 |
| Phalombe | Male | 4364 (31) | 5701 (41) | 69 |
| | Female | 3511 (25) | 6932 (50) | 35 |
| | Total | 4077 (29) | 6122 (44) | 104 |

| District name | Gender of household head | Mean in MK (and USD ) | Std. Deviation (MK and USD) | N |
|---|---|---|---|---|
| Totals | Male | 15160 (108) | 27788 (198) | 444 |
| | Female | 6929 (49) | 11952 (85) | 130 |
| | Total | 13296 (95) | 25318 (181) | 574 |

## 8.3 Limiting Factors of Agricultural Production

The agricultural production in the study areas was affected by a number of factors. Most respondents listed high fertiliser prices as the highest among all the limiting factors, followed by weather fluctuation. Shortage of land is reported as a limiting factor of production only in Phalombe and Mulanje by 14% and 22% of the households, respectively. Phalombe and Mulanje are among the most densely populated districts in Malawi with a high rating for land scarcity and an average farm size of 0.5 hectare. In Mulanje, most of the land is under tea estates. Shortage of labour is reported as a major production constraint only in Ntchisi and Nkhotakota and even there by only 5% of the households.

Illness or death of a member of a household or a relative is also considered a major production constraint by 10%, 5.5% and 3.9% of the households in Nkhotakota, Ntchisi and Mulanje, respectively. In general, agricultural or economic activities are disrupted when a member of a family falls sick as the concentration of attention means that there are fewer resources available in the household for other activities.

## 8.4 Strategies to Cope with the Limiting Factors of Production

The farmers use a combination of strategies to deal with factors limiting agricultural production. Application of compost manure is a response to high prices of fertiliser and low soil fertility problems. The other major responses within agriculture are reliance on the government's subsidy program, producing own seed, mixed cropping, leasing land and reducing the fertiliser application. Interventions that will reduce dependence of chemical fertilisers and rain-fed agriculture contribute to boost agricultural production in the four study areas, although land size is a major constraint, especially in Mulanje and Phalombe.

# 9. Forest Products and Utilisation

## 9.1 Woodlot Ownership and Forest Products Use

The study also collected data on woodlot ownership and the use of forest products. Only a few households (15%) had their own planted woodlots. In general, the most common wood species grown by the majority of the households are Acacia (30%), Blue Gum (Eucalyptus) (27.8%) and Gmelina (11.1%). The species composition is lowest in Phalombe where households grow Acacia, Blue Gum and Cinderella. In Nkhotakota and Ntchisi districts, 15% and 11% of households, respectively are growing wood. Eight to ten different species are commonly grown, including indigenous species like Mbawa, Mthethe, and Msungwi.

## 9.2 Woodlot Areas

Among the 15% of the households that owned woodlots, the study collected data on plot sizes of different species planted. Household woodlots ranged from 0.05 ha to 2.0 ha, with an average of 0.3 ha per household. Very few species were planted on plots above 0.5 ha, with the exception of Mulanje, where woodlots for Acacia and Cinderella were on average above one hectare in size. Most households obtained their tree seedlings or seeds from the Forestry Department, except in Mulanje.

The Forestry Department is a major supplier of tree seedlings or seeds to 40%, 60% and 45% of the households in Nkhotakota, Ntchisi and Phalombe districts, respectively. In contrast, nearly 70% of the households in Mulanje district raised their own seedlings or seeds for woodlots. The proportion of households who raised own seedlings to establish their woodlots in Nkhotakota, Ntchisi and Phalombe is also substantial accounting for 40%, 29% and 37% of the households in the three areas, respectively. Given the importance of forests to rural livelihoods and the constraints faced by the Forestry Department in meeting the demand for tree seedlings, it seems important to train farmers to grow seedlings of different species.

## 9.3 Use of Forest Products

Households get forest products from the forest reserves, forest plantations, village or community forests, their own woodlots, private markets or farms, amongst others. Data on distances to the forest product markets or point of origin showed that distances ranged from 0 to 5 km, with 1.5 km. being the mean distance, with a standard deviation of 1.67 km. Most households had easy access to the forest products within less than 1.0 km, except for timber and poles in Mulanje and Phalombe, where households travel more than one km. For instance, in the case of

firewood, about 86.4% of those who had accessed firewood indicated that they obtained it within 1 km. Similar trends were observed for those who obtained thatch grass (86.3%), mushroom (87.2%) and many other products.

In terms of time taken to collect the various forest products, most households spend at least one hour per trip and make 2 to 3 trips per week. The amount collected per week varies with the product type and family size. It must be noted that not all forest products are available throughout the year. Some products such as wild fruits, mushrooms and thatch grass are seasonal.

## 9.4 Acquisition of Forest Products

Having established that there is significant use of various forest products by the sampled households, the study also examined the origin of each of the major forest product utilised. Most households collected fruits and mushroom freely from the forest reserves. Seventy percent of the respondents who had utilised firewood indicated that they obtained it for free. Only a few households reported buying various forest products. The situation is different in Phalombe, where 39% of the respondents had bought firewood, 64% had bought timber and 29% admitted having poached timber. A degree of poaching of firewood was admitted in all districts. In Mulanje, the respondents stated that they had bought all the timber and poles they used.

## 9.5 Forest Product Marketing

Very few households stated that they had participated in the sale of forest products. There was a generally low commercial demand for forest products in Nkhotakota, Ntchisi and Mulanje districts, because an abundance of forest products were freely collected by households. More households in Phalombe participate in forest product marketing than any other area. The main products sold are firewood and charcoal.

Most of the forest products are collected by female members of the household. In all districts, about 2/3 of all forest products used are collected by women, while their husbands collect about 1/5. Another 10% are collected by female children, while male children stand for miniscule percentages. Often, women sell forest products by the roadside, while men transport the products to established markets. Most of the forest products are carried on the head. In a few cases, households use their personal or hired vehicles for the transport.

# 10. Household Vulnerability

## 10.1 Food Security

From the analysis, each year, most households exhaust their own produced food well before the next harvest. This situation is worst among female-headed households. On average, male- and female-headed households in the study areas generated enough staple food of their own to last only 5.12-6.34 months. In general, the households in Mulanje were the least food secure of all the four districts, and reported having no self-produced food for 8 months of the year. The comparative period for households in the rest of the areas studied is 5 months. Households in Nkhotakota and Ntchisi were the most food secure; Phalombe falls in between.

Female-headed households had a higher level of food insecurity on average than male-headed households, and reported having no self-produced food for periods ranging from six to nine months. This is due to the different economic status of male- and female-headed households with regard to factors like land ownership and the purchase of farm inputs, fertilisers and improved seed (NSO, 2005). The number of households that had staple food till the next harvest was only 7.1% and 3.5% for male- and female-headed households, respectively).

The study analyzed the extent of food insecurity during the non-critical period, and especially the critical period from December-March. During non-critical periods more than 96% of the households in all districts take both lunch and dinner, but only 55% of the households take breakfast. During such period when food stocks are low, the proportion of households that take breakfast drops to only 9%. Only 7.8% of households in the four study areas take all three meals during the critical period. During critical periods more than 50% of the households take lunch and 95% take dinner in all the four districts, although the frequency in is lower in female-headed households (93.1% vs. 95.4%).

## 10.2 Household Coping Mechanisms

Households devise a number of strategies to cope with food insecurity. The most important coping mechanisms across all districts were piece work or “ganyu”, reduced meal frequency and reliance on wild foods (vegetables, fruits and game). The relative importance of some coping mechanisms is specific to different districts. For example, petty trading and wage employment are the most important coping strategies among sampled households in Mulanje and Phalombe. Sale of household assets is also common among households in Nkhotakota and Ntchisi districts. Some of the households in Ntchisi rely on borrowing money from friends and relatives to purchase food.

## 10.3 External Shocks Suffered by Households

The study sought to establish the types of shocks the households in the study areas have been through in the past year. The major shocks included floods, drought, death or critical illness of a household member, earthquake and hailstorm. In the past five years, about 40% of the households have suffered from effects of drought which negatively affected their harvests. Twenty percent of male-headed households and 32% of female-headed households reported that a household member had passed away during the past 6 years. In general, these shocks seriously disturb life and livelihoods of the affected households.

## 10.4 Responses to Shocks

Households are often left helpless when disasters strike. Most have no strategy to cope with the aftermath of major shocks like earthquakes, storms, flash floods, landslides, hail storms and the death of a household member. In some cases, the government and NGOs provide some relief items to the victims of some such shocks. For the majority of households that are affected by major shocks, however, limited response is available by the outside world and local institutions to help the victims, whose livelihoods often worsen considerably. For example, after floods in Nkhotakota, households were given agricultural production aid in the forms of seeds, fertilisers and relief items.

The households deploy different measures to cope with drought. Among the measures are sale of livestock, reliance on relief food or inferior foods, and government support in form of fertiliser and seeds. During serious sickness of a member of the household, 70% of the households have sought medical assistance at the hospitals/clinics. In Phalombe 30% of the households interviewed said they had done nothing special during periods of critical sickness of a member of a household.

# 11. Community-Level Institutions

## 11.1 Available Institutions

The existence and effective operations of local institutions is key for sustainable natural resource management and economic development. The study examined the availability of local-level institutions in the study areas. Households reported having knowledge of several local-level institutions within their locality, including CBNRM agencies, formal credit clubs, informal credit clubs, farmer clubs, CBOs, home based care organisations, bee–keeping clubs, village health committees, PTAs and school committees. More than 90% of the households in Nkhotakota were aware of most of these institutions. In the other three study areas, however, there are significant variations of knowledge of such institutions by households. In general, significant efforts in building local or grass root institutions have been undertaken in various parts of the country. In spite of this, there is still much scope for increasing the profile and reach of the institutions at the local level.

## 11.2 Household Participation in Local Institutions

The study further asked whether the respondents participate in various local institutions existing in their localities. The study showed that most households were not members of the existing local institutions, even where they were aware of their existence.

Only 385 of the 616 households responded to these questions regarding participation in the local level institutions. Of these, the participation rate in CBNRM was 25% -- higher than in any other institution. Overall, the highest participation rate was found highest in Ntchisi (42%) and the lowest in Mulanje (5.7%). The participation rate among male-headed households (26%) was much higher than for female-headed households (9%). There were very low participation rates in formal credit clubs (10%) informal credit clubs (5.7%) village health committee (8.6%), farmers' clubs (10%), CBOs (14%) and school committees (9%).

## 11.3 Positions held in Different Local Institutions

The study enquired into the positions that male- and female-headed households held in the various institutions, emphasising the offices of chairman/chairwoman, secretary, treasurer, committee member, amongst others. Women's participation was prominent in local institutions addressing as CBNRM, formal credit clubs, CBOs, bee-keeping and village health committees. In such institutions/ organisations, female-headed households even held positions of chairperson besides secretary and committee member. In other local institutions, participation of female-headed households was very minimal.

The study showed that the principle of gender participation is becoming entrenched in rural areas. The study did not analyze the differences in effectiveness of institutions with strong female participation versus those with weak female participation. Equally important would be information on factors that lead to females acquiring positions of importance in local institutions.

# 12. Drivers of Change

The study collected information regarding the perception of the households and communities regarding change and key drivers of change in their communities.

## 12.1 Assessment of Change in the Agricultural Sector

Household perceptions of changes in the agricultural sector, as shown by the study indicate that the agricultural sector has not been performing to the expectation of the households. In all the districts, the respondents hold that there are increased incidences of crop failure, high agricultural input prices, limited access to agricultural credit, severity of food insecurity, poorer soil fertility and productivity, and that crop harvests and land availability have worsened over the years. The households stated that the prices of agricultural products and the provision of agricultural extension services have improved for some households, but worsened for others.

The study revealed population increase as the key driver, affecting the amount or unavailability of land for farming, the possibility that farmers will engage in crop rotation and the general severity of food insecurity. Government policies were often considered to be responsible for increasing prices of agricultural inputs, food insecurity, poor extension services and lack of access to agricultural credit. Interestingly, the respondents cited climate change as a major cause of crop failure, of increasing severity of food insecurity, of the loss of soil fertility and productivity and generally of low agricultural production.

## 12.2 Assessment of Change in the Health Sector

The study determined that, according to the households' perceptions, most health indicators have worsened. A combination of factors including the HIV/AIDS pandemic, was associated with this perception. These are factors which have led to increased mortality and deaths and an increase in the number of foster children. Hunger or food insecurity were perceived to be the main cause of high infant mortality and child malnutrition. Another factor perceived to contribute to this change was bad government policies. Climate change was associated with further spread of disease, epidemics and prevalence of malaria. Lack of mosquito nets is also associated with the increased incidence of malaria. Another perceived cause of worsening health indicators, such as infant and maternal mortality, was long distances to hospital.

## 12.3 Assessment of Change in Education Indicators

The majority of households reported a general improvement in the quality of education and the proportion of children going to school over the past five years. However, the perception concerning adult literacy was very mixed. These findings support earlier findings in this report where results indicate that children have access to education facilities.

The households generally stated that, due to increased awareness in the community and improved government policies on free primary education, there has been increased access to education, as well as a general improvement in the quality of education. The main reason for the drop in adult literacy is lack of teachers. Most adult literacy teachers are not employed, but work as volunteers. Due to lack of incentives, there are few adult literacy classes operating in the country, hence the drop in adult literacy levels.

## 12.4 Drivers of Environmental Change

The households' assessments of their environmental situations, and of the key drivers of change t were also documented in the study. The general perception among households was that most environmental indicators, such as deforestation, amount of rainfall received and size of natural forests, have worsened. However, their balancing perception was that illegal access to forest products from protected forests and the clearing of land for farming have been reduced.

The population increase was perceived as the main cause of deforestation/forest clearing and the scarcity of firewood. In its turn, deforestation was perceived to be a prime cause of firewood scarcity in all the districts. Climate change was also seen as a driving force for the increased occurrence of natural disasters and rainfall fluctuations.

## 12.5 Assessment of Other Indicators

Other indicators that were studied include the general poverty levels, corruption, theft/criminality and the number of community initiatives and employment opportunities. Most households stated that the general poverty levels, employment opportunities and corruption have worsened over the years. However, there were mixed perception in the household sample regarding the number of community initiatives and the security level.

Increased poverty was perceived as the key driver for the worsening indicators regarding theft/criminality, corruption and reduction in number of self-help initiatives. The population increase and lack of farm inputs were perceived as drivers for increases in poverty. With regard to employment opportunities, the majority of households cited that inadequate companies, corruption and poverty are associated with high unemployment in all districts.

# 13. Demand and Access to Services

The study collected information from households on services provided by public and private institutions in the sampled areas. With the exception of business advisory services, more than half of the respondents stated that most other required services – postal agencies, agricultural extension, input and output agents/markets – were available in all districts.

## 13.1 Access to Services and Amenities

Most services and amenities were perceived as readily accessible and available to the majority of households in Nkhotakota, but less so in other districts. The majority of responses in Mulanje indicated that the households did not have access to postal services, agricultural extension, major markets for buying and selling produce and communication facilities (telephone). Household perceptions were also quite critical in Ntchisi, especially on postal services, markets for buying and selling agricultural produce, tarmac roads and telephones. These two districts are more remote, and with rugged terrains. Access to agricultural input and output markets was perceived to be critical for achieving food security and increased incomes.

The surveys discerned divergent views on the quality of various services and amenities across the districts. Whilst households in Nkhotakota generally expressed favourable opinions, the views in Ntchisi were the most critical. In particular, both input and sales markets related to buying inputs and selling produce exemplify this divergence. Critical views on marketing services were shared to a high degree by households in Mulanje and Phalombe. This is significant because the rural communities are very dependent on good functioning markets for their economic situation.

Levels of satisfaction for services and amenities such as main local market, forestry advisory services and communication were mostly favourable. Every community noted its own specific developmental needs which if addressed, would significantly improve livelihoods. Whilst government and other stakeholders strive to address such needs, gaps still exist in various communities.

## 13.2 Desired Interventions

The study team asked the households to state their own desire for interventions they would want to see in their villages, why they needed such interventions and their own possible contributions towards the required interventions. At least twenty nine interventions were mentioned. They are summarised in Table 18 below.

Safe water and credit or loan facilities were identified as desired by the majority of households across all districts. Other desired services included agricultural markets and health care. Markets and loans also came up as critical required interventions, demonstrating that rural households are keen to be well integrated into national and even global agricultural markets.

Various reasons were given for the choice of the interventions. With regard to credit or loans, the majority (69%) said they were needed for creating small businesses. Starting small businesses and improving yields were also the major reasons cited for requesting better agricultural markets. Other responses given noted the need to increase yields and reduce poverty. The rural households' appreciation of the interplay between different factors and how this influences their livelihoods implies that rural households are likely to ignore interventions that will not improve their wellbeing.

***Table 18: Services desired by the local communities (%)***

| | Nkhotakota | Ntchisi | Mulanje | Phalombe | Full sample |
|---|---|---|---|---|---|
| Construction of bridge | 0.0 | 1.2 | 16.3 | 2.9 | 4.9 |
| Fertiliser subsidy | 5.6 | 4.8 | 0.0 | 1.4 | 2.5 |
| Credit/loans | 26.7 | 26.5 | 17.5 | 21.7 | 23.5 |
| Health centre | 17.8 | 6.0 | 15.0 | 8.7 | 12.3 |
| Safe water | 27.8 | 20.5 | 20.0 | 30.4 | 24.7 |
| Irrigation | 5.6 | 10.8 | 2.5 | 14.5 | 7.4 |
| School | 7.8 | 3.6 | 7.5 | 4.3 | 6.2 |
| Agricultural market | 5.6 | 12.0 | 18.8 | 8.7 | 11.1 |
| Fertiliser loan | 2.2 | 10.8 | 2.5 | 4.3 | 4.9 |
| Livestock credit loan | 1.1 | 3.6 | 0.0 | 2.9 | 2.5 |
| Total (%) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Sample (N) | 90 | 83 | 80 | 69 | 322 |

## 13.3 Contributions towards the Desired Interventions

The households were asked what contributions they would make themselves towards realizing desired interventions concerning credit, safe water and agricultural markets. In the case of credit, the households stated a readiness, inter alia, to work hard in their own fields, to form credit associations and to pay back the loans. This seems to reflect a realisation of factors underlying previous uses of credit and the reasons why they have not had the intended impacts. The challenge for credit providers has been to avoid errors of inclusion and exclusion, which have been costly for the entire agricultural sector in Malawi.

In terms of contributions towards safe water, the household' major offered contributions were in the form of support for construction and maintenance of water facilities. Contributions mentioned included collection of sand and moulding of bricks. Provision of general support and moulding of bricks were also mentioned in relation to improving agricultural markets.

# 14. Environmental Integration in Overall Portfolio

As part of the TOR, the study team assessed the degree to which environmental concerns had been integrated into non-specific environmental interventions in a sample of between 5 to 10% of such interventions aided by Norway. The selected projects are non-explicit environmental in character, but were purposely selected in sectors/areas in which environmental aspects are essential, like agriculture, human rights and general budget support. The selected projects are also relatively large, since it is mandatory to carry out appraisals which include environmental issues for projects above NOK 15 million (Norad's Manual).

## 14.1 Bunda College Capacity Development Program (MWI–0005)

This project refers to the capacity building support provided to Bunda College, established by the Ministry of Agriculture, which is now one of the five constituent colleges of the University of Malawi. The Action Plan and Budget for the Bunda College Capacity Development Programme (BCDP) for the period July 2008 to June 2009 does not mention environment explicitly, but does focus on the need for capacity building for natural resources growth and development.

The baseline study team noted that Norad raised the issue of climate change and environment in internal notes related to this Action Plan during the preparation for the 2008 annual meeting with the college. The leader of the Norad delegation suggested that Bunda College should pay special attention to changes in national policies in both Malawi and Norway with respect to adaptation to climate change. The need for increased capacity building in Malawi on early warning systems and climate change issues in general were specially noted.

The minutes from that meeting do mention that Norad offered support to the College for activities related to the recommendations of the Bali Conference on climate change, with a particular pledge to support forestry activities as a climate change adaptation issue. The minutes do also reflect an expressed opinion made by Norad that Bunda College should be aware and involve itself in the ongoing Norway-supported TLC programme for climate change adaptation. There is no explicit mention in the archived unsigned minutes or agreements from the 2008 annual meeting that these recommendations were adopted. The follow up by the Norwegian authorities after this meeting seems to have been insignificant.

## 14.2 Budget Support (MWI–0007)

The Norwegian budget support to Malawi is linked to the goals of the MGDS, whose key priorities are agriculture, food security, irrigation, water development, transport infrastructure development, energy, integrated rural development, prevention of mal-nutrition, and combating HIV/AIDS.

Under the sub-chapter "Conservation of the Natural Resource Base", the MGDS points to the need to reduce environmental degradation, and to maintain fish species and biodiversity. It further mentions the need to focus on forestry, environment, wildlife protection enforcement / cooperation in environmental management, awareness building, improved school curricula and environmental information systems.

However, there are no reports or minutes on file that indicate that the environmental objectives and goals have been adequately covered in the budget support negotiations and programme implementation. There are references to the problems of implementing the MGDS environmental objectives relating to weak enforcement of regulations, lack of economic incentives, unclear objectives, conflicting service delivery systems, impacts of tsetse on wildlife management, insufficient capacity building, weaknesses in the marketing of ecotourism, and the need for institutional strengthening in general.

The Performance Assessment Framework (PAF) linked to several donors' support makes no reference to the environment. Whilst the PAF has developed indicators for measuring performance in the social sectors, governance and public finance management, it has no indicators for assessing environmental achievements.

The documents forming the basis for Norwegian decisions on budget support presuppose environmental integration and climate change adaptation within the supported sectors and activities; however, these issues are inadequately followed up in the various Malawian strategies, actions and reports. Based on documents on file, there appear to have been no substantial attempts to rectify the weak integration of environment in this programme.

## 14.3 FAO: Enhancing Food Security and Sustainable Livelihoods (MWI–2637)

The programme is involved in a number of environmental approaches related to shallow wells and stream regulation, the use of vetiver grass against erosion, hedge rows and agro-forestry, fruit trees and fish farming.

FAO has now applied to Norway for funds to upscale efforts on adaptation to climate change, and is considering joining with the World Bank in a climate risk assessment project. This is in addition to funding for conservation agriculture, forestry and reforestation, water and agro-forestry activities.

Environmental activities are integrated into the programme, but are somewhat limited to food- and energy-related issues. Capacity building will be an important part as well as the promotion of sustainable use of natural resources. Built into this

is an environmental community awareness program, with special focus on reducing deforestation and erosion through tree planting and other conservation measures. The study team found that the environment was well covered and mainstreamed in this programme.

## 14.4 National Census of Agriculture and Livestock (MWI–2617)

The overall goal of this project is to build national capacity to produce reliable national statistics. The principal outputs expected under this item are:

i) To get reliable, comprehensive and timely data on the structure of agricultural holdings (production, agricultural plot sizes, livestock, marketing, food security, irrigation technology, poverty, the HIV/AIDS pandemic, community cooperation and land tenure);
ii) to build capacity for data processing of collected material.

A secondary goal is to assess possible impacts of the new land-law policy in Malawi. The census will also provide a basis for comparisons over time and identify reasons for social inequality, considering distribution of social capital, land ownership and management. Training of local staff represents a key component of this project.

Although the census includes data on previous food security disasters caused by floods and droughts, there is no inclusion of any environmental indicators in the census documents. The study team suggests that environmental statistics should be included in the list of statistical elements for future censuses. This will at least provide information of value when dealing with future environmental stress or disaster situations.

## 14.5 UNDP Civil Society Frame Agreement (MWI–2635)

This is a basket programme for support to the Council for NGOs, which encompasses 20 NGOs working on human rights in Malawi. The programme includes governance, child rights, women's rights, as well as organisational support and training in basic rights for NGO members in the Human Rights Consultative Committee.

The support, channelled through UNDP, is directed at capacity building of marginalised people, for CSO training in proposal writing, project management, finance management, policy analyses and more. Important focus areas are the media, public debate, community mobilisation, training of trainers, theatre performances and transparency in operations. All the projects are allocated to human rights activities; there is no reference to environmental issues in the documentation.

The study team is of the opinion that important environmental issues like community access to resources, clean water, adequate sewerage systems, household fuel provision, etc. might have added important benefits to this programme, especially since some of these environmental efforts are measured as part of the Millennium Development Goals.

## 14.6 NASFAM phase III: Improving smallholder livelihoods (MWI–2603)

The National Association of Small-holder Farmers of Malawi (NASFAM) is a comprehensive large-scale and well connected programme for small-scale farmers. Agroforestry, tree planting and multi-crop production is promoted in its Strategic Development Plan (2006-2011), but the project's focus is on production and profit. The environment only plays a role where it fits into such an approach.

NASFAM has been made aware of Norwegian policies in favour of the environment, gender and human rights, and the embassy has encouraged NASFAM to partner with other environmentally focused projects in Malawi like the Mount Mulanje Conservation Trust and the Chia Lagoon project. The embassy also suggested in November 2007 that climate change adaptation should be an area of activity for NASFAM. Inclement weather risk insurance has been discussed in the project, and the gender issue seems to have received increased attention due to the embassy influence.

In spite of good efforts initially, the study team finds that the environment can not yet be considered as mainstreamed into the implementation of the studied programmes.

# 15. Summary and Conclusions

This study has attempted to analyse and visualise life and livelihoods in the rural area of Malawi, which are amongst the poorest areas in the world. As in most other assessments, the economic and social characteristics point to a persistent and self-perpetuating poverty, acting in most cases as a driving factor for continued environmental impoverishments, which could further undermine development efforts.

The study has revealed increasing signs of distress on the natural resources in all the four areas, contributing towards increased poverty of the adjacent villages. The Phalombe/Mulanje districts are under the heaviest pressure for commercial charcoal production to supply urban centres like Blantyre. The management regime of Mulanje forest reserve is somewhat better than the one in the Ntchisi forest reserve, but is prone to forest clearing by households for farming. Mulanje/Phalombe area seems to have a better potential for management of forest resources, tourism and local energy needs. There is need to design programmes and projects that will ensure sustainable utilization of forest products from the reserve and implementing projects that will reduce dependence on forest reserves as the main source of livelihood.

Farming is the main economic activity and the main crops are maize, groundnuts, tobacco and cassava. Tea and pineapple are additional major income sources in Mulanje. Shortage of land constitutes limiting factors for agricultural production in the project areas, together with very low yields, especially in two districts. For these reasons, the level of vulnerability to food insecurity is high. Very few households have their own planted woodlots. The implication is that communities around the protected areas will inevitably continue to encroach into these areas in search of farm land and other extractable resources, unless appropriate interventions are introduced to raise yields and alternative means of livelihood. Access to credit is limited; friends/relatives, NGOs and Government being major sources. The few loans given are mostly used for buying food and agricultural inputs, and as business capital (about a quarter).

The social development characteristics also put the conclusion in perspective. The education level of most household heads is generally low; and a significant number is illiterate. Primary-level education has improved, but the proportion of attendance and duration of education is still low. Interventions to bring more school-age children into school are important, together with an enhancement of adult education.

The high incidence of such diseases as malaria, eye diseases, HIV/AIDS, airborne and waterborne diseases and injuries constitute huge losses for the households, both emotionally and in socio-economic terms. This is coupled with the fact that most households remain largely helpless to fend off perpetual external shocks of the environment and health hazards.

Still, the study concludes that communities have analyzed both their externally dependent and their self-created problems. It has been frequently stated that the main driver towards negative development is the rapid population increase, and that the villagers themselves have not acted prudently on demographic, health and economic issues.

The villagers have indicated their priorities for desired interventions, calling for safe water, better access to health institutions, better marketing related to agricultural produce and credit facilities. The findings of the baseline survey also show that significant efforts have taken place in all areas to build local or grassroots institutions. The existence of these institutions, although still weak, offers a variety of entry points for community-based interventions. It is also encouraging that households are prepared to make contributions toward the success of the desired interventions. These contributions will ensure local-level ownership of the interventions.

The sample of eight non-specific environmental projects in Malawi is really too small to form clear conclusions. Yet, the baseline study team discern clear tendencies in these projects - as did the Tanzania study team – that the Norwegian aid administration pointed explicitly to the importance of adherence to sound environmental policy when discussing development assistance or projects in annual meetings or project planning sessions with the relevant government authorities. Several of these statements were noted in the minutes from the meetings. However, these environmental policy issues were almost never reflected in subsequent agreed minutes, formal agreements, contracts or activity planning.

Issues of longer term sustainability and concern about ongoing depletion of the country's resource base, were hardly ever raised in the context of project planning or reviews in non-specific environmental efforts. In some cases, problems in implementation were directly related to environmental issues, but these were rarely fully acknowledged and the solutions were normally sought in technology and finance. There is also a lack of environmental indicators in general projects, as well as lack of environmental and social impact assessments in project planning and impacts evaluations.

# Annexes

# Annex 1: Environmental Audit, Contents and Methods

The transect lines for this study were registered both in relation to landscape features and also by latitudes and longitudes, in order for new teams to be able to return to the same sites and to register any differences found in 2015. Village and household studies would also help to determine whether changes could be attributed to programme activities

The transects lines run on compass courses from a coordinate-determined reference point through customary village settlement/agricultural land and into the heart of the protected forest reserves, to ensure representation by both customary and protected areas. Plots of 100 by 10 metres were systematically laid out at a distance of approximately 500 metres along each transect.

One member of the study team went first with the compass and a distance measuring tape, helped by a forest worker to clear vegetation for the line. Once he reached the beginning of a plot, the study team went along the plot in its full width (10 meters) measuring and registering resource items, features, issues and data as a team consultative exercise, while the plot registrar wrote down the agreed register data. The registered figures were multiplied by 10 to get numbers per hectare.

**Transects Coordinates**

| District | Transect no. | No. of plots | Direction | Feature/ reference point | Latitude | Longitude |
|---|---|---|---|---|---|---|
| Ntchisi | 1 | 10 | 340 | Road junction in Kalira | 8456828 | 583267 |
| Nkhotakota | 2 | 8 | 310 | School block in Mwansambo | 8532621 | 620603 |
| Phalombe | 3 | 6 | 160 | Water tank north of Phalombe village | 8247943 | 786641 |
| Mulanje | 4 | 4 | 0 (north) | Bridge/rock | 8231223 | 784595 |

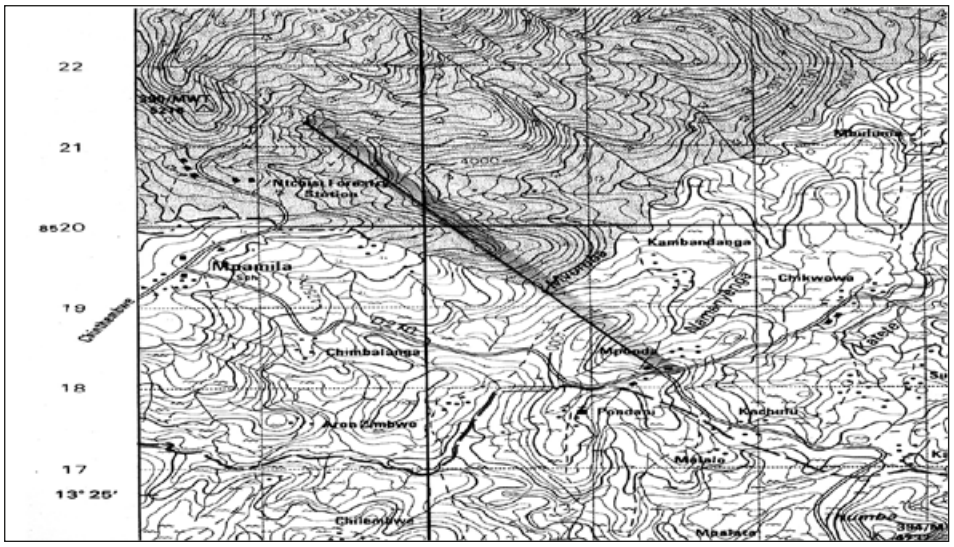
The environmental audits registered the following data for each transect plot: altitude, climate, land tenure system, land utilisation, ecosystem type, tree density, standing tree volume, seedling density, soil type, pollution, sloping gradient, ground cover, water situation, erosion/sedimentation, signs of wild animals, signs of endemic species, other land uses, infrastructure, land market value, charcoal off-take, timber and wood off-take, other extractive off-take, population pressure and other pressures.

**Transect descriptions**

The two environmental baseline transect lines in Ntchisi and Nkhotakota districts, run from permanent reference village points through cultivated areas and rand zones and into the before mentioned reserves (Ntchisi Forest Reserve). Starting point villages were decided in collaboration with TLC, and the two villages are located in Kabila and the Mwansambo EPA. Transects include sample plots that were fairly regularly spaced over an estimated length of about 6 kilometers.

This Ntchisi (Kalira) transect line (see Figure 4) runs from an easily identifiable road junction in a small village along the road from Mwansambo to the Ntchisi Forest Reserve and forest station. It passes a few village houses and goes down a steep hill used in subsistence agriculture, crosses a stream and moves up the next hill also used in subsistence agriculture. On the top of the ridge there are some scattered miombo trees and shrubs before the line again falls into a valley used in subsistence agriculture. Then the line goes up the next ridge past a small village and into deteriorated community-controlled miombo woodland. Half the transect line has so far gone through deteriorated terrain, that is often too steep for agriculture. It then continues through heavily degraded and burnt woodland with scattered trees, elephant grass and eroded soils. Burning is apparent all along the transect line. On some hillsides, the line passes through heavy tall grass cover. In this area, there are many signs of fuel-wood collection, but not of charcoal burning. The transect line finally runs uphill through grasslands with scattered large pine trees until it reaches the Pinus patula plantation covering the upper ridge. These plantations are the only land-use type along the transect line that shows any signs of proper forest management.

***Fig. 4 Ntchisi transect line***




The Nkhotakota transect line (Figure 5) starts at an easily identified schoolhouse in a Mwansambo village (Chiondo) and runs through gently undulating terrain containing some subsistence agriculture until it reaches the lower north-eastern part of the forest reserve

These two transect lines are located on the northern and the southern slopes of the Mulanje Mountain Forest Reserve, respectively. The two transect lines in the Mulanje/Phalombe region are quite different from those in Nkhotakota and Ntchisi districts, due to the special features of the mountain slopes.

The Phalombe transect line (Figure 6) runs from an easily identifiable low-level water holding tank a short distance from Phalombe village along the Fort Lister road. The line immediately crosses a river bed and continues uphill on a fair sloping gradient, running through miombo woodland.

***Fig. 5 Nkhotakota transect line***

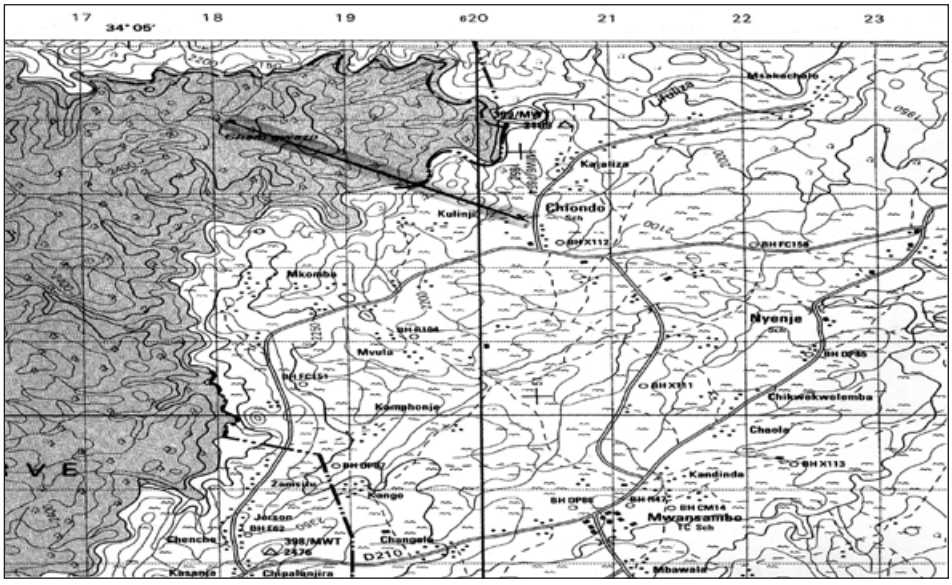
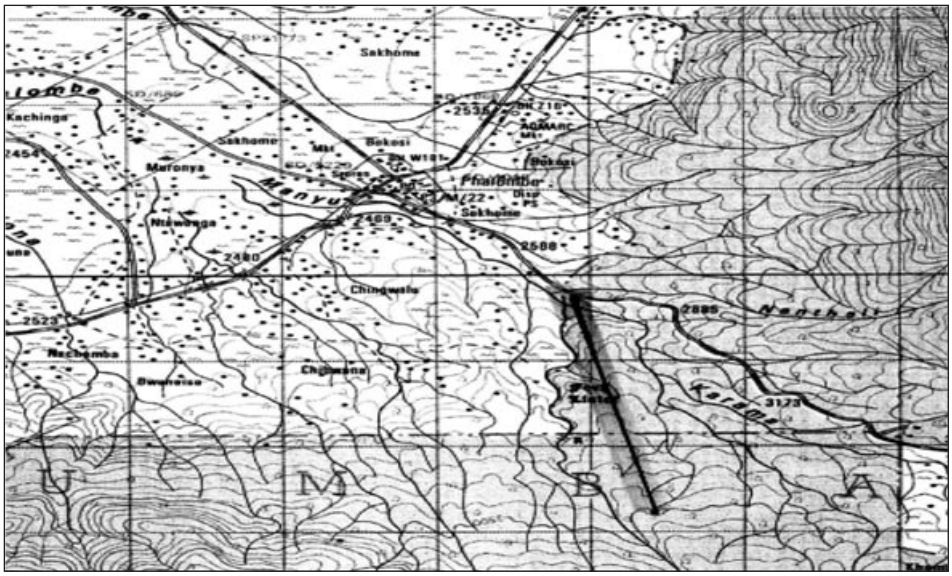


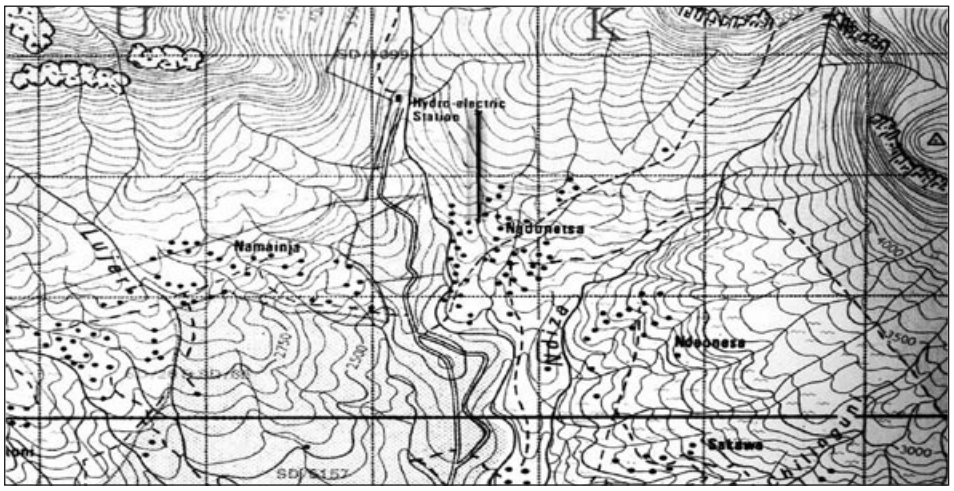

***Fig. 6 Phalombe transect line***



In the beginning this line runs through areas of considerable overuse by illegal charcoal burners. Illegal production is visible along the entire transect, but does diminish in intensity as one goes along. The surrounding woodland is also being harvested for mushrooms, medicinal plants and bush meat. In the upper parts, the miombo forest is in fair shape and the area is well stocked with tree seedlings and saplings. If left in peace, this woodland would recuperate well fairly rapidly

The Mulanje transect line (Figure 7) begins at a reference point near a village on a tea estate, which consist of a stream bridge and some boulders. The transect goes initially through intensive, well managed and fertile agricultural lands (maize and tea), but soon enters the boundary belt of eucalyptus plantations separating the tea plantation areas from the Mulanje Mountain Forest Reserve.

***Fig. 7 Mulanje transect line***




**Transect area trends**

The study team registered an increasing pressure on the natural resources due to population growth in the Mwansambo and Kalira EPAs. The resource utilisation is already close to its limit and beyond its carrying capacity. Increasing signs of distress on the natural resources are evident, contributing to increased poverty of the adjacent villages.

# Annex 2: Coordinates, Centre of Environmental Audit Plots

| District | Transect | Plot | Longitude | Latitude |
|---|---|---|---|---|
| Ntchisi | 1 | 1 | 611157 | 8517947 |
| Ntchisi | 1 | 2 | 610842 | 8518440 |
| Ntchisi | 1 | 3 | 610622 | 8518886 |
| Ntchisi | 1 | 4 | 610343 | 8519282 |
| Ntchisi | 1 | 5 | 610148 | 8519674 |
| Ntchisi | 1 | 6 | 609907 | 8520183 |
| Ntchisi | 1 | 7 | 609516 | 8520482 |
| Ntchisi | 1 | 8 | 609633 | 8520660 |
| Ntchisi | 1 | 9 | 609420 | 8521217 |
| Ntchisi | 1 | 10 | 609386 | 8521277 |
| Nkhotakota | 2 | 1 | 620356 | 8532798 |
| Nkhotakota | 2 | 2 | 620028 | 8533038 |
| Nkhotakota | 2 | 3 | 619674 | 8533213 |
| Nkhotakota | 2 | 4 | 619675 | 8533213 |
| Nkhotakota | 2 | 5 | 619109 | 8533618 |
| Nkhotakota | 2 | 6 | 618762 | 8533780 |
| Nkhotakota | 2 | 7 | 618769 | 8533783 |
| Nkhotakota | 2 | 8 | 618081 | 8534078 |
| Phalombe | 3 | 1 | 784899 | 8249269 |
| Phalombe | 3 | 2 | 785317 | 8248965 |
| Phalombe | 3 | 3 | 784951 | 8248870 |
| Phalombe | 3 | 4 | 785019 | 8248481 |
| Phalombe | 3 | 5 | 785175 | 8248126 |
| Phalombe | 3 | 6 | 785484 | 8247234 |
| Mulanje | 4 | 1 | 784620 | 8231565 |
| Mulanje | 4 | 2 | 784625 | 8232038 |
| Mulanje | 4 | 3 | 784614 | 8232258 |
| Mulanje | 4 | 4 | 784647 | 8232529 |

# Annex 3: Methodology for Socio-Economic Survey

Twenty community surveys were administered to a group of individuals consisting of chiefs, local administration, police, head teachers, religious leaders in key positions at the local level. The community questionnaire contained information that is applicable to the entire village such as household incomes in general, availability and assessment of quality of different services and facilities, food security, environmental change and drivers of change, among others. The majority of the groups (15) comprised an equal number of male and female discussants and 5 groups were composed only of female discussants, as summarised in the below:

***Distribution of community group by group type***

| District name | Group type | | Total |
|---|---|---|---|
| | Female | Mixed | |
| Nkhotakota | 2 | 3 | 5 |
| Ntchisi | 0 | 5 | 5 |
| Mulanje | 2 | 3 | 5 |
| Phalombe | 1 | 4 | 5 |
| **Total** | **5** | **15** | **20** |

The household questionnaires were administered to randomly selected households. The sampling design for the household survey aimed at securing representative data to provide information on the socio-economic situations of the local inhabitants. The data were collected in the central watersheds in Nkhotakota district and upland areas in Ntchisi district in TAs Mwansambo and Kasakula, which fall within Mwansambo and Kalira EPAs, respectively[8]. In the southern region, data were collected in TAs Mabuka and Laston Njema within Milonde EPA (also called Mulanje Boma EPA) in Mulanje district[9]. In Phalombe district, data were collected from villages surrounding the foot of Mulanje Mountain in TA Mkhumba which falls within Naminjiwa EPA[10].

In the two areas, chieftaincy sizes are different. Comparatively, the number of households per village is smaller in Nkhotakota and Ntchisi than in Mulanje and Phalombe districts. Nevertheless, a three-stage sampling procedure to select

8 TA Mwansambo in Nkhotakota district and TA Kasakula in Ntchisi district are among the TAs where TLC is undertaking a number of livelihood augmentation programmes with the local communities.
9 TAs Laston Njema and Mabuka are among the TAs in Mulanje district where MMCT and the Forestry Department are undertaking conservation programs with the local communities.
10 TA Mkhumba in Phalombe district is also covered by MMCT activities.

households was used in both sites. The first stage involved the purposeful selection of five (5) group village headmen (GVHs) within TAs Mwansambo and Kasakula which falls within Mwansambo and Kalira EPAs in Nkhotakota and Ntchisi, respectively. Second, between three (3) and five (5) villages from the selected GVHs were randomly selected. Finally, at least 3 to 12 households were randomly selected from the sampled villages. In total, at least 30 households were selected from each of the sampled GVHs.

In Mulanje and Phalombe districts, the first stage involved the purposeful selection of two (2) GVHs within TAs Mabuka and Laston Njema in Mulanje district which falls within Milonde or Mulanje Boma EPA. In Phalombe district, one (1) GVH was selected from the TA Mkhumba under Naminjiwa EPA.

In the second stage, between two (2) and four (4) villages were randomly selected from each of the GVHs. Finally, from the sampled villages, at least 30 households were randomly selected from the sampled villages depending on the number of households in the villages.

***Sampled households in each EPA/district***

| District | | Gender of household head | | Total |
|---|---|---|---|---|
| | | Male | Female | |
| Nkhotakota | Sample (N) | 124 | 39 | 163 |
| (Mwansambo EPA) | % | 76.1 | 23.9 | 100.0 |
| Ntchisi | Count | 109 | 40 | 149 |
| (Kalira EPA) | % | 73.2 | 26.8 | 100.0 |
| Mulanje | Count | 90 | 62 | 152 |
| (Milonde EPA) | % | 59.2 | 40.8 | 100.0 |
| Phalombe | Count | 89 | 63 | 152 |
| (Naminjiwa EPA) | % | 58.6 | 41.4 | 100.0 |
| Full sample | Count | 412 | 204 | 616 |
| | % | 66.9 | 33.1 | 100.0 |

In total, 59-93 households were selected from each GVH. In all areas, the sample included a representative sub-sample of female-headed households and a representative sub-sample of households that fall within all the 5 socio-economic quintiles, according to the perception of local villagers. The survey also covered tobacco- and tea-growing areas in Ntchisi and Mulanje, respectively. In total, 616 household questionnaires were administered in Nkhotakota, Ntchisi, Mulanje and Phalombe from November 17th to December 5th, 2008 as summarised in Table B above.

The household questionnaires were executed by a team of seven (7) enumerators and two supervisors while the community questionnaires were administered exclusively by the Principal investigator assisted by three Research Assistants. After

completing administration of the community questionnaires, the Research Assistants joined the rest of the group to administer household questionnaires. All questionnaires for the Baseline Survey were given to the supervisors for quality checks and onward transmission to the data manager for data entry. Data entry and analysis of the questionnaires were done in Excel (graphs), SPSS and STATA.

# Annex 4: Household Questionnaire

Submitted to Norad as unpublished document.

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