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Country Environmental Profile for Malawi

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Consortium



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Acronyms and Abbreviations

ADB	African Development Bank
ADBG	African Development Banking Group
BOD	Biological Oxygen Demand
CBNRM	Community Based Natural Resource Management
CBO	Community Based Organisation
CCNRME	Cabinet Committee on Natural Resource Management & Environment
CIDA	Canadian International Development Agency
CITES	Convention on International Trade of Endangered Species
CSP	Country Strategy Paper
DA	District Assembly
DANIDA	Danish International Development Agency
DCAFS	Donor Committee on Agriculture and Food Security
DEAU	District Environmental Affairs Unit
DESC	District Environment Sub-Committee
DFID	Department for International Development (UK)
DLG	Department of Local Government
DP	Decentralisation Policy (1998)
DPDMA	Department of Poverty and Disaster Management Affairs
EAD	Environmental Affairs Department
EAP	Environmental Action Plan
EAO	Environmental Area Officers
EDO	Environment District Officer
EDF	European Development Fund
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMA	Environmental Management Act
ESP	Environmental Support Program
EU	European Union
FAO	Food and Agriculture Organisation of the UN
FIDP	Farm Income Diversification Program
GoM	Government of Malawi
GHGEs	Greenhouse Gas Emissions
GTZ	Gesellschaft für Technische Zusammenarbeit (German technical Cooperation)
IDAF	Institutional Development across the Agro-Food Sector
IFAD	International Fund for Agricultural Development
IFMSL	Improved Forest Management for Sustainable Livelihoods
IGPWP	Income-Generating Public Works Program
ITCZ	Inter-Tropical Convergence Zone

JICA	Japan International Cooperation Agency
LGA	Local Government Act (1998)
MAFSP	Multi-Annual Food Security Program
MEPD	Ministry of Economic Planning and Development
MEET	Malawi Environmental Endowment Trust
MEGS	Malawi Economic Growth Strategy
MGDS	Malawi Growth and Development Strategy
MLHS	Ministry of Lands, Housing and Surveys
MPP4	4th Micro-Projects Program
MoA	Ministry of Agriculture
MoNREA	Minister of Natural Resources and Environmental Affairs
NAPA	National Adaptation Plan of Action (2005)
NCE	National Council for the Environment
NEAP	National Environmental Action Plan
NEFP	National Environmental Focal Point
NIP	National Indicative Program
NGO	Non Governmental Organisation
NRM	Natural Resource Management
NRMC	Natural Resource Management Committee
NRME	Natural Resources Management and Environment
NSSD	National Strategy for Sustainable Development
OPC	Office of the President and Cabinet
PROSCARP	Promotion of Soil Conservation and Rural Production
PRSP	Poverty Reduction Strategy Paper
SEA	Strategic Environmental Assessment
SNRP	Sustainable Nutrition Rehabilitation Program
SOER	State of the Environment Report
TCE	Technical Committee on the Environment
THA	Traditional Housing Areas
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WB	World Bank
WESM	Wildlife and Environment Society Malawi
WHO	World Health Organisation
WFP	World Food Program

Units of Measurement

ha	Hectares
kg	Kilograms

kg/yr	Kilograms per year
km ²	Square kilometres
Mm ³	Million cubic metres
MW	Megawatts
t/yr	tons per year
yr	Year
y.o.	Years old
~	Approximately

1. Summary

1.1 State of the environment

About 85% of Malawi's estimated population of over 12.3 million live in rural areas and the total population is expected to double over 20 to 25 years. The average population density is 105 people/km², but higher, at ~143/km², in the southern region. There are over 6 million people farming as smallholders (75% of all farmer family members) on fragmented customary land and ~1/3rd of all agriculture taking place on land considered to be unsuitable for agriculture.

The over-riding environmental issue is land degradation resulting from population and land pressure, especially in the densely populated southern region. The key issues are soil erosion, decreasing soil fertility and deforestation, and extreme climatic variations all affecting agricultural production and all linked sectors of the economy through a multiplier effect. Major problems currently are:

- Inappropriate land management practices and agriculture on unsuitable land, and widespread use of fertile soils, timber and firewood for brick production and construction.
- Very high soil erosion rates (10-43t/ha/yr) negatively affecting services such as water supplies, fisheries, lake and river transport, electricity generation, agriculture and irrigation. Increasing soil sediment loads are an important threat to water quality.
- Other main threats to water quality include pollution with sewerage in urban areas and with agro-chemicals in rural areas, and the proliferation of invasive plants. The country's lakes, rivers and wetlands and wetland ecosystem functions are all under threat.
- Changes in hydrological regime over the past 40 years have been from perennial to seasonal, mainly due to significant variations in weather patterns, ranging from severe droughts to extreme flood events with associated landslides and strong winds. This has also led to aridification in some areas of the country – mainly in the central and southern Shire Valley.
- There is high energy demand, with 93%, from fuel wood and charcoal. Forest cover has declined from ~ 47% in 1975, to ~26% in 2006 (4.4 to 1.9 million ha from 1972 to 1992), with 21% under Forest and Wildlife Reserves and National Parks, leaving only 7% on customary land. Deforestation continues at a rate of ~2.8% -3.4% per year. By 1992 it was estimated that the annual wood consumption of 5.2 Mm³ exceeded sustainable supply by 3.3 Mm³ and a fuelwood crisis is looming.

Malawi's biological diversity is highly varied with ~100 plants, reptiles, amphibians, and ~500 endemic fish species in Lake Malawi. There are 33 protected large mammals and 11 protected tree species, most of which are found in the five National Parks and four game reserves, covering 11.6% of the country's land area, or in the lakes, wetlands and rivers. Biological diversity is now seriously threatened, mainly due to habitat encroachment and decline, over-harvesting, and the introduction of alien species. About 60% of the country has been modified, leaving only 36% under natural vegetation.

Poaching, mainly using wire snares, has caused the decline of many of the large mammal species. Nyala, waterbuck and sable antelope populations have significantly declined in National Parks and reserves, and the elephant population is now reduced to vulnerable status. Game hunting is limited to a few small game species, but game bird hunting is permitted, and trapping is recognised as a major economic activity. Trapping continues in the nesting season though, so the activity is non-sustainable.

The fisheries sector is very important, with artisanal fisheries located mainly in rivers and inshore areas accounting for 85-95% of the annual catch of ~50,000 tons. Aquaculture and fish farming are not yet well developed. Fish provide 60-70% of the country's animal protein intake, but per capita supplies have steadily fallen (12.9 kg/yr in 1976 to 6.4 kg/yr in 2003) due to over-fishing. This has caused declining catches, a reduction in size and age of catch, altering the species composition and biodiversity of fish-stocks and decreasing protein supply. Fish species and aquatic biodiversity are also under serious threat due to siltation of spawning grounds, and the prevention of fish migration to breeding areas in rivers because of weirs and other obstructions.

NTFPs are increasing sources of alternative or complementary income and a risk of over-exploitation exists due lacking management. Fire mostly of human origin, is one of the greatest threats to forestry, with productivity regularly destroyed by bushfires.

The general living conditions, characterized by widespread poverty and decreasing trends in food and economic security create a dependence on short-term income generation instead of long-term, sustainable natural resource management. With so many people producing staple food crops on very small, manually cultivated, rainfed plots (<0.5ha/family), there is little opportunity for food and income security, and with shifting agriculture no longer possible, soil fertility and crop yields are rapidly declining. Meanwhile, livestock and range productivity are limited by the lack of availability of grazing land. Livestock numbers are low, so impacts from livestock are restricted to marginal areas such as hill sides, where they cause erosion, and to wetlands and riverine areas, affecting wetland function.

These problems have encouraged non-sustainable Income-generating strategies such as live tree-felling to make charcoal to sell, and cropping on riverbanks and in seasonally dry stream beds.

Irrigation development has quadrupled over the past 40 years and water-related vector-borne diseases prevail around irrigation schemes. Meanwhile, domestic water consumption is steadily rising, with surface water and groundwater quality still acceptable for human consumption but the major rivers showing increasing pollution.

Urban growth is increasing at a rate of $\sim 6.7\%$, with the current urban population estimated at 1.4 million. Of this, 60-70% live in traditional housing areas and unplanned squatter settlements. Poor or disregarded planning has resulted in extreme urban squalor and deprivation, poor sanitation, and the rapid spread of communicable waterborne diseases. Improper disposal of wastes (liquid and solid), agro-chemicals (fertilisers and pesticides), and effluent from industries, hospitals and other institutions are major urban problems with only 77% of proper disposed waste and most of the waste water enters the river systems that provide drinking water for downstream communities as raw sewerage.

The environmental impact of mining and industries is still limited due to the minor economic role of the sectors, but extraction of construction materials e.g. sand and clay for bricks, lime for cement (with a high demand for fuelwood for brick-making), are increasing. Sand and gravel extraction leave large holes, providing environments for disease vectors and waterborne pathogens, and disrupting fish breeding grounds. Industries, mainly in agro-processing, compound the pressure on the urban waste management systems. Other mining and industry issues include cement-making, which is the second greatest contributor to GHGEs in Malawi, after agricultural-related causes, and creation of noise, dust, air pollution from furnaces, and effluent by-products, but these impacts are currently very low.

The importance of a national environmental information system (EIS) was clearly stated in the NEAP in 1996, but a regular systematic survey has never been implemented.

1.2 Environmental policy, legislative and institutional framework

Since 1996, a large number of sectoral and overall policies related to environment have been developed and implemented. There is a generally good environmental legislative framework including EIA, standards and norms, but there are aspects that need better harmonisation and some legislation still awaiting approval. Malawi is also a signatory to many International and Regional Treaties and Conventions concerning Environment and Natural Resources

The actual problem is that the policy and legislative framework are very complex and relevant documents are often only known about in the concerned department or ministry. There are few follow-ups and/or concrete actions aside from policy development and existing regulations for the different economic sectors are not always respected, which is mainly due to a lack of priority within Government, and a lack of funding, manpower, and equipment in the technical departments for control.

The institutional framework for environmental management is set through the Environmental Management Act (1996). The framework is divided into 4 administrative levels and the Environmental Affairs Department (EAD) is the central coordinating body. The current Institutional Framework is highly complex due to the number and size of the institutions involved in administering environmental affairs. This includes confusion about responsibilities and a general lack of awareness of cross-cutting environmental issues and how to include them into project design. In addition, the delivery of environmental management services is fragmented across NRM sector ministries dealing with environmental issues, resulting in a lack of coordination.

GoM accords an important position to civil society in the environment management system. District Assemblies are responsible for managing local development plans, ensuring the implementation of concrete environmental actions, and including EIA and environmental and natural resource utilisation programs by CBOs and NGOs, who, along with Scientific Research Institutions, are included in the policy development process at national level. But there is still a lack of understanding of roles and responsibilities in environmental management at the village level, often resulting in expectancy that the government has to manage and pay for everything.

Human capacity is generally constrained starting from Departmental level, right through to the District and village level. The technical capacity within the environmental management system is lacking, with key personnel not in place. At the District level, EDOs are either absent or their role is carried out by unqualified/untrained staff. Most of the GoM structures are operating with less than 50% of the necessary staff and key tasks especially implementation, monitoring, control and coordination, are not assured. Lack of adequately trained people is a problem in some technical disciplines, especially in the 'brown environment' (waste water and solid waste management, air pollution control). Research institutions are not being proactive enough in adapting student courses to deal with new issues and social and technical needs.

District technical support and community programs have been assumed by NGOs and CBOs through donor funds due to missing capacities (human and finances) in the districts. Lack of management capacities exist at all levels including NGOs, and communities often get

inadequate or incomplete support resulting from programs that are often subsequently not sustained.

Funding of environmental activities is insufficient at all levels. The budgets requested by the different departments are never fully allocated, mainly resulting in reduced field activities such as control and supervision missions and surveys. Due to a low number of paying clients and increasing urban environmental problems, the maintenance and extension of basic services cannot be provided adequately in urban areas by the City Assemblies. Districts have neither equipment nor recurrent budgets to operate extension and maintenance operations. This results in rapid deterioration of infrastructure developments.

At the national level, information exchange and circulation are already very slow, but when added to the weaknesses in implementation capacity, effective, sustainable NRM, is further impeded.

1.3 EU and other donor co-operation with the Country from an environmental perspective

Most of the assistance is implemented through specific sector Programs of each donor corresponding to the GoM's priorities. SWAPs exist for the health and education sectors but have not yet been developed for the environment-related sectors (mainly agriculture). After environment-specific programs in the period 1990 to 2000, environmental issues are now generally embedded as cross-cutting issues in sector programs.

The EU has been one of the most important donors in the sector for some time now (EDF 7, EDF 8). The ongoing EDF 9 focuses on agriculture/food security/natural resources, transport/ infrastructure and macro-economic support. Justice, governance, non-state actors, health and trade are also supported as non-focal sectors.

Several Programs have significant environment components mainly in sustainable agriculture, forestry and water/sanitation. They include: Support to Implementation of the Malawi Land Reform Program, 4th Micro-Projects Program (MPP4), Farm Income Diversification Program (FIDP), Improved Forest Management for Sustainable Livelihoods (IFMSL), Institutional Development across the Agro-Food Sector (IDAF), Sustainable Nutrition Rehabilitation Program (SNRP), Multi-Annual Food Security Program (MAFSP), 2002 Emergency Food Aid, Income-Generating Public Works Program (IGPWP).

Environmental aspects are included in the preparation phase of new projects, and regular monitoring (mid-term reviews, reporting ...) are specific to project objectives with the risk that secondary environmental effects may not be fully appreciated. Environmental impact

monitoring should be done by the concerned districts, but their capacities are usually too weak or completely lacking. Recently, no EIA has been done because the EU's 'road maintenance programs' do not include new road construction and the programs have long been completely implemented. SEA and/or environmental audits have never been done.

Other donors are funding a large number of programs and projects with an environmental focus and/or anticipated impacts (WB, ADB, USAID, JICA, CIDA, Norway, UNDP, WFP, FAO, IFAD, and UNICEF) (Annex 7.2.9).

A Donor Coordination Committee is operational in the agriculture/food security sector (DCAFS) but it focuses on agriculture production while environmental issues are rarely targeted as a priority. Coordination has improved, but fragmented and/or non-harmonised actions and approaches still limit the benefits. A specific Donor Committee on environment no longer operates due to the actual Governmental approach to environment as a cross cutting issue in sector programs. The lack of coordination has resulted in fragmented environmental actions and lack of a holistic view.

The general impact of donor activities on environment is still limited, with the main problem being non-sustainability of the outputs. The creation of parallel structures by donor funded projects concentrates the best human capacity into well-paid project jobs, resulting in the loss of capacity in the Government and local administration. Donor interventions have contributed to better environment awareness, and a more or less complete legal framework and action plans, but the implementation of sustainable NRM is still at early stage. In general, the direct support to combat environmental problems has decreased with the conversion of environment and natural resource management programs into a cross-cutting issue. This is because little effort has been made to address the country's environmental-poverty nexus through the realisation of environmental management and planning.

1.4 Conclusions and recommendations

Conclusion 1: Widespread poverty, land pressure and population growth, absence of land tenure and associated lack of incentives to reinvest inland and natural resources, inadequate agricultural practices, deforestation, erosion, degradation of wetlands and biodiversity continue to be the principal threats to the natural resources. Environmental degradation is still increasing. The importance of key environmental pressures and their linkages on the predominantly agrarian society's natural resources are only well-understood and described in the upper administrative levels, while the concepts are only poorly understood and poorly implemented at the local level.

Conclusion 2: The natural resource policies, strategies and acts are, in general, written and approved by GoM. Environmental issues are also integrated in sector and overall policies (NSSD, MGDS). Some sector strategies need more harmonisation, while policies for waste, waste-water and air pollution are not yet approved. But the key problem is the extremely low level of implementation. This situation is due to two main problems:

- A. The institutional framework is too complicated. Effective management is difficult and many people do not understand the framework.
- B. Lack of predominantly human capacity for strategic planning and coordination, lack of staff and finances for implementation and control, and lack of technical equipment.

Conclusion 3: Decentralisation, transfer of competences and cooperative management systems are potential mechanisms to enhance more sustainable use of natural resources, but the tasks are unclear and the process has not yet been accepted by all stakeholders. Implementation efforts are isolated and have not yet had any significant positive impact on the conservation and sustainable use of natural resources.

Conclusion 4: The important function of environment monitoring and information sharing/circulation seems to be neglected. The absence of coordinated regular and viable data collection/sharing and the lack of an operating national environmental information system (EIS) prevent the objective evaluation of environmental impact (through SEA) of government and donor funded Programs.

Conclusion 5: Increasing urban environmental problems are very poorly addressed by the government and the donor community.

Recommendations

Institutional

- Simplify the institutional framework and reduce/eliminate parallel structures due to projects and non-harmonised national structures.
- Promote SWAP and sector budget support especially in agriculture, forestry, water/irrigation, wildlife and fisheries, to harmonise and coordinate Programs and conduct SEA for the main (sub) sectors, especially irrigation and the GoM's identified growth sectors.
- Give EAD an independent status as an Environmental Protection Agency, or attach it at a higher institutional level (Office of the President & Cabinet), and leverage GoM to be more efficient in staffing allocations
- Clarify the roles and tasks of stakeholders, GoM, NGOs, CBOs, Private Sector, and Donors, in implementation, leaving GoM to focus on the core functions: policy,

coordinating, regulations and control. Encourage civil society to adopt management and implementation roles

- Ensure the application of existing environmental laws and legislations by enforcement of human and financial capacities at decentralised and national level

Information/communication/monitoring

- Promote environmental awareness and understanding by sharing, circulation and transparency of environmental information and adapted explanatory material for the public
- Identify simple standardised nationwide key indicators for environmental monitoring, and implement a National Environmental Information System able to translate the performance of sustainable development across all sectors.
- Promote social programs to reduce the population growth rate, through health, and family planning education.

Decentralisation

- Promote the transfer of competence for natural resource management (human and financial capacities, cooperative management systems) to decentralised structures (Districts, CBOs)
- Promote local land use planning and holistic approaches concerning NRM
- Make sub funds available for environmental micro-projects and associated technical assistance at local level (District, CBO) and help them to develop self-financing mechanisms for NRM

Rural development

- Encourage and support the land reform process to promote ownership and responsibility for natural resources, and to support the use of a wider range and better cultivation techniques for soil conservation
- Promote alternative income generation in rural areas using multiple resources (permaculture systems) for sustainable natural resource use, agriculture combined with economics, management and financial training
- Promote household energy saving Programs to reduce firewood consumption and dependence on wood-energy in urban areas

Urban development

- Ensure that urban services for waste and waste water management are effective and functional.
- Support waste reducing and recycling by appropriate waste management systems and promote the use of proper technologies by adopting fiscal and other financial regulations

- Urgently implement the ‘pollutant pays’ principal, starting with the most polluting industries and private sectors.
- Promote the integration of environmental aspects in urban planning and ensure the application of the plans

Biodiversity

Implement specific programs for protected areas based on cooperative management systems to conserve biodiversity and conserve the potential for the tourist sector development

EU specific recommendations

- Integrate environmental performance indicators and monitor these, and conduct general environmental audits for the focal sectors
- Support and direct the focus of priority sectors on implementing concrete field actions instead of institutional or policy development.
- Integrate an urban infrastructure component in the public works Program (IGPWP)
- Continue the support to MAGIC and promote their integration into a National Environmental Information System. Encourage GoM Departments to share and provide access to their baseline information for its most effective use in the development process.
- Facilitate access to EU finance mechanisms outside the EDF, especially budget line environment, ACP facilities for water and energy.

2. State of the Environment

2.1 Physical and biological environment

2.1.1 Climate, climate change and climate variability

Malawi is about 900 km long and 80-161 km wide, with a total area of 118,484 km² (11.8 million ha), of which 9.4 million ha is land. The remaining 2.4 million ha, about 20%, is covered by water, mainly Lake Malawi, which is 586 km long and 16-80 km wide. The rest of the water area is accounted for by the major lakes of Chilwa, Malombe and Chiuta and rivers.

Lying between latitude 9° 22' and 17° 7' S. and between longitudes 32° 40' and 35° 55' E, the climate is tropical continental and largely influenced by the huge water mass of Lake Malawi. There are three main seasons: cool and dry, from May to August; warm and dry, from September to November; and warm and wet, from December to April. The five-month rainy season differs slightly in Southern and Central Regions (November to March). Annual rainfall ranges from 600mm in lower Shire Valley and Karonga lakeshore plains, to over 3,000 mm in high elevation areas with mean annual rainfall being 1,180 mm. Its distribution is mostly influenced by the topography and proximity of Lake Malawi. Temperatures are greatly influenced by the topography and decrease with increasing altitude. The mean maximum and minimum temperatures are 28 °C and 10 °C respectively in the plateau areas, and 32 °C and 14 °C respectively in the rift valley plains. The climate of Malawi and changes in the distribution of rainfall in particular, are strongly influenced by pressure and wind systems governed by movement of the Inter-Tropical Convergence Zone (ITCZ) and associated distribution belts.

Disturbances of the ITCZ and shifts in the global circulation pattern, the El Niño Southern Oscillation (ENSO) phenomenon, in addition to deforestation, rate of evapo-transpiration, green house gas emissions and disruption in the hydrological system lead to climatic changes.

Since the 1970s, Malawi has experienced significant variations in weather patterns, ranging from severe drought (1978-79, 1981-82, 1991/92) conditions to extreme flood events (1996/97, 2000/2001, 2002/2003) and strong winds. These extreme variations seriously affect agricultural production and all other sectors of the economy through inter-sectoral links and multiplier effects.

2.1.2 Geology and mineral resources

The geology of Malawi is dominated by the Precambrian basement gneiss covering about 85% of the country. Sedimentary quaternary alluvial deposits and permo-triassic to quaternary sedimentary and volcanic rocks occur in the Lakeshore Plains and the Shire Valley. Some intrusive rocks (syenite, granite) exist in the southern part of the country.

Malawi is endowed with a number of mineral resources that are not presently being exploited. At present, mining operations are limited to small-scale production of coal, cement, limestone, rubies and sapphires. Mineral deposits and reserves (in million tons) are identified for bauxite (28,8), uranium (12,5), monazite/strontianite (11,0), corundum (8,0), graphite (2,7), limestone (25,0), titanium heavy mineral sands (1.395,0), vermiculite (2,5), coal (19,0), phosphate (2,0), pyrite (34,0), glass sands (1,6) and dimension stone and gemstones (MEPD, 2006).

2.1.3 Land and soils

Malawi is characterised by an extremely diverse physical environment. This wide range of relief is a major determinant of the climatic, hydrological and edaphic conditions of the country, and hence its agricultural potential. Malawi may be divided into four main physiographic zones as follows:

The Highlands: are extensive highland tracts, the most prominent of which are the Mulanje, Zomba and Dedza mountains, attain elevations of 1,600 – 3,000m above sea level.

The Plateaux: are located at elevations of between 1,000 and 1,600m above sea level, and cover extensive tracts of the Central and Northern Regions. Their gently undulating surfaces are characterised by broad valleys and interfluvies and thus are drained mainly by “dambo” streams that flow seasonally through shallow and swampy valleys.

The Rift Valley Escarpment: in Malawi, the East African Rift descends from the plateaux in a series of stepped faults, known collectively as the Rift Valley Escarpment. This zone of often precipitous slopes is, in general, highly dissected and commonly characterised by bare recent erosion surfaces.

The Rift Valley Plains: are depositional plains largely formed by the deposition of materials eroded from the Rift Valley Escarpment. They are characterised by subdued relief and gentle slopes, and extend along parts of the Lake Malawi shore and the Upper Shire Valley. Average elevations are less than 600m above sea level and decline to below 100m in the Lower Shire Valley.

Malawi's land systems are dominated by three major soil types:

Eutric leptisols (Lpe) are commonly referred to as lithosols. The most widespread of the lithosol group are the shallow stony soils associated with steep slopes and cover ~ 2,243,390 ha. These occur in all areas of broken relief.

Chromic luvisols (LVx) are referred to as latosols. These red-yellow soils include the ferruginous soils of Lilongwe Plain and parts of the Southern Region, and are among the best agricultural soils in the country. They are generally of good structure and are normally deep and well drained, but include the weathered ferrallitic (plateau or sandveld) soils, some with a high lateritic content, which are of low natural fertility and easily exhausted. Latosols cover an area of ~2,233,153 ha. Ferralic cambisols have similar characteristics to Chromic luvisols, but mostly occur on the western border of the country.

Haplic lixisols (LXh) include the alluvial soils of the lacustrine and river-line plains, vertisols of the Lower Shire Valley and the Phalombe Plain and mopanosols in the Liwonde and Balaka areas. These cover a total area of 1,671,495 ha.

Land pressure and land degradation (soil erosion and decreasing soil fertility) are the principal environmental problems facing Malawi, with 85% of the country's population living in rural areas. The scale and intensity of land degradation from soil erosion varies from 10t/ha/yr to 43t/ha/yr (World Bank, 1992) and erosion is still increasing, with the worst degradation in the densely populated southern region. The main causes are population pressure, inappropriate land management practices and deforestation. Erosion has major effects on services such as water, fisheries, lake and river transport, electricity generation, agriculture and irrigation.

2.1.4 Water (lakes, rivers, surface water, groundwater)

Malawi is endowed with a vast expanse of surface water systems, which include its network of rivers and four major lakes. The major rivers are the Shire, Ruo, Bua, South Rukuru, Linthipe, Songwe and Dwangwa. The country is divided into 17 Water Resources Areas (WRAs) corresponding each to one river basin and they are subdivided into 78 Water Resources Units (WRUs). There are two major drainage systems:

- About 91% of the country is located in the Zambezi River basin and the Lake Malawi system is part of this. The Shire River is the only outlet of the lake, with an average flow of 400m³/s.
- The Lake Chilwa system, which is shared with Mozambique and is an endorheic drainage basin fed by rivers originating from the eastern slopes of the Shire Highlands, Zomba Plateau and the northern slopes of Mulanje Massif.

The major lakes are:

- Lake Malawi, which is the third largest freshwater lake in Africa, with a total surface area of 28 760 km² (including the part of the lake controlled by Mozambique). The lake is 570 km long, 16 to 80 km wide, and has a total storage of 1 000 km³. Its average depth is 426 m, while its maximum depth is 700 m. It is the most important single water resource and plays a vital role in the socio-economic development of the country.
- Lake Malombe covers ~303 km², (~ 30 km by ~ 15 km), with an average depth of 4 m.
- Lake Chilwa lies on the border between Malawi and Mozambique and is the "sink" of an endorheic basin. Its surface area is very variable but on average is 683 km², of which 721 km² lies in Malawi. It is a shallow, saline lake with an average depth of 2 m.
- Lake Chiuta, separated from Lake Chilwa by a sand bar of 20-25 m height, lies on the Mozambique border. It is 5m deep and covers 200 km², with ~40 km² in Mozambique.

Groundwater resources are also widespread throughout the country. Their occurrence is associated with two types of aquifers: (i) the extensive, but relatively low yielding weathered Precambrian basement gneiss complex formations, which accounts for about 85% of the country's geology, and (ii) the relatively high yielding quaternary alluvial deposits occurring in the Lakeshore Plains and the Shire Valley. The basement complex aquifers can yield up to 2 l/sec, while alluvial aquifers can yield up to 20 l/sec. Water in the basement complex aquifer has a relatively low concentration of salts, while in alluvial aquifers the water is highly mineralised.

Malawi's total renewable water resources are estimated at 17.28km³/yr. From this, 16.14km³/yr are produced internally, while about 1 km³/yr comes from Mozambique via the Ruo River and 0.14 km³/yr is from a lake shared with Mozambique along the course of the Shire River. Almost all of the internal groundwater resources of 1.4km³/yr are thought to be drained by the rivers, as Malawi is a humid, enclosed country. Water resource distribution is highly variable both seasonally and geographically, as nearly 90% of the runoff in major rivers occurs between December and June (FAO, 2006).

The country has experienced increased depletion of many of its water resources and degradation through pollution and increasing sediment loads, in almost all its water resources, mainly due to climatic variations and pressures associated with an ever-increasing population.

Most of the main rivers are still perennial, while the smaller rivers and streams have become seasonal over the past 40 years due to the marked increase in land use and deforestation over the period (ADB, 2006). Diminishing base flows have also been recorded in several major rivers (EAD, 2002) in recent years. From the early 1980's to the late 1990's, the level of Lake Malawi steadily dropped until the daily mean levels reached the lowest in more than sixty years in 1997. Consequently the main flow in the Shire River dropped to close to 130m³/s, which was much less than the required minimum flow for the hydro-electric power generation.

2.1.5 Ecosystems and biodiversity

- Ecosystems

Malawi occurs in the Zambezian phyto-region which has been mapped into eight eco-regions (7.2. 3) by the WWF-US (Cumming, 1999). The Miombo woodland zones are the most dominant terrestrial eco-zones. Montane forests occur in high altitude and rainfall areas. Mopane woodlands frequently occur on fertile soils in the south around Shire River and the lakes. Swamps, seasonally wet grasslands (*dambos*), and perennial wetlands, are all important habitats for waterfowl. The large area covered by lakes and river systems form another dominant ecosystem. Malawi's eco-systems are greatly threatened by the human pressure, and ~60% of the country has been modified, leaving only 36% under natural vegetation (EAD, 2002).

- Biodiversity

Malawi's biological diversity is highly varied over its terrestrial and aquatic habitats. In 1997, there were 6,105 plant species listed, of which ~100 are endemic. Cumming (1999) records 187 mammals, 124 reptiles, 54 amphibians, 600 fishes and 630 birds. Several reptiles, amphibians and ~500 of the estimated 500-1,000 fish species found in Lake Malawi are endemic. In addition 8,621 invertebrates have been recorded, but the total number is estimated to be between 129,000 and 558,000, and mainly insects (Dudley, 1996). There are 33 protected large mammal and 11 protected tree species.

Due to the pressures on all natural resources, biological diversity is seriously threatened. Outside the protected areas, the pressures from expansion of agriculture production and unsustainable harvesting have already resulted in the extinction of many species and loss of habitats.

Natural forests represent the remainder of the Miombo forests that once covered almost the whole country. Over the last 40 years the forest cover has declined to the extent that by 1975 only 47% of Malawi was classified as forest. By 2000 this had dropped to 28%, of which 21% was made up of forest reserves, National Parks and wildlife reserves, leaving

only 7% as forest areas still existing on customary land. The forested areas have declined from 4.4 to 1.9 Million ha between 1972 and 1992. In 2006 the forest cover is now estimated to be less than 26% and deforestation due to human pressure continues at ~2.8% per year. Deforestation rate is the highest at 3.4% in the northern region because the other two regions are already heavily deforested.

In colonial times five National Parks and four game reserves were established to protect wildlife, and these still account for 11.6% of the country's land area (annex 7. I. 5). Many of the large mammal species including buffalo, lion, nyala and elephant are on the decline. Poaching, encroachment and habitat destruction are the major problems with species such as cheetah and wild dog (Annex 7.2. 4) on the edge of extinction. Most of the terrestrial fauna is now only found in the protected areas.

Fish species, especially in Lake Malawi, are under serious threat and fish stocks are declining due to over-fishing and siltation of spawning grounds. Species like the lake salmon/Mpasa (*Obsaridium microlepis*) are now listed as endangered on the World Conservation Union (IUCN) red list.

2.1.6 Risk of natural disasters

Malawi has a high risk of climatic and hydrological hazards (droughts, storms, floods and associated landslides - see 7.2. 6). The country has had two major droughts in the past 50 years (1948-49 and 1991-92). Almost the entire country is vulnerable to drought, but places such as the Lower Shire Valley and Rumphi West have been worst affected. A few cyclones have hit Malawi, with two of these (1946 in Zomba, and 1956 in the Lower Shire Valley) being particularly severe. In addition, torrential rains cause floods, washouts, and inundation of low lying areas. Severe local storms (tornadoes and hailstorms) have been known to occur anywhere in the country during every rainy season.

There are four river basin systems in Malawi that regularly experience severe floods: the Ruo/Shire, Likangala/Thondwe, Liphasa/ Luweya and the Songwe. More than 40% of disasters in Malawi have been caused by severe floods, including those experienced in 1942, 1946, 1956 and 1991, with the latest disasters occurred in 1997, 2001/2 and 2003. Heavy cyclonic rainfall causes landslides, severe erosion, flash floods and boulder deposition, as well as being responsible for widespread inundation. Some settlements at the foot of mountains and prominent hills are also at high risk of landslides. Problems are aggravated by human activities such as overcultivation and deforestation and non adapted construction of new houses, roads, industrial facilities and other infrastructures.

Malawi is further vulnerable to a relatively low-level earthquake risk associated with seismic activity of the East African Rift Valley. The largest internal tremor, though of magnitude 6.1, killed 8 people and damaged a few buildings in Salima in 1989.

Pest hazards (insects, weeds/pathogens, vertebrates) cause annual losses in agriculture, forestry, infrastructure and human health of millions of Kwacha. These include locusts, army-worms and Quelea birds. Some pests are affecting the aquatic environment, of particular concern is the water hyacinth (*Eichornia crassipes*) which has invaded Lake Malawi from the Lower Shire River and is a threat to the fishing and energy industry.

2.2 Socio-economic environment

2.2.1 Pressures on the natural resources

- Agriculture and livestock raising

Malawi's economy remains agro-based with the agriculture sector accounting for ~40% of GDP, employs about 85% of the labour force and accounts for 75% per cent of foreign exchange earnings. There are two types of landholdings: Commercial estates, with few farmers occupying 1.2 million ha, and Smallholders occupying ~4.5 million ha, and survive on subsistence and cash crop agriculture (ADB 2006). The main agricultural export crop is tobacco, followed by tea, sugar and coffee. Livestock production also contributes to livelihoods from agriculture, but land for grazing cattle and smallstock such as goats, sheep, and pigs is not readily available, with most land taken up by crop production.

While commercial farms are either owned, or have long-term leases (99 years), smallholders do not own the land they occupy, because it belongs to the state. This situation compounds problems of land degradation, because of the lack of reinvestment by the people into their land resources.

With an estimated population of more than 12.3 million and an average population density of 105 persons/km², Malawi is the most densely populated country in sub-Saharan Africa. Extremely high land pressure on agriculture land especially in the southern region (143 persons/km²) is the key problem of poverty and land degradation in Malawi. Over 6 million smallholders (~75%) farm on fragmented customary land with little opportunity for food and income security. The national mean land holding size decreased from 1.53 ha in 1968/69 to 0.80 ha in 2000, with ³/₄ of smallholders cultivating < 1 ha and 41% cultivating <0.5 ha. In rural areas, 60% of households (= 41% of the total population) produce less than they need to feed the family (Noragric 2005).

With an ever increasing population, and limited opportunities for livelihoods outside the agricultural sector there has been ever-increasing pressure on land, with people attempting to farm in increasingly unsuitable areas and land systems, particularly on steep hillsides. It's estimated that about a third of all agriculture takes place in unsuitable land (EU 2006). Crop rotation through shifting agriculture is no longer possible and the result is declining soil fertility and crop yields. To survive people have adopted income generating strategies that include felling live trees to make charcoal for sale and encroachment onto riverbanks and even into seasonally dry stream beds to produce winter crops.

Crop production systems are mainly through manual cultivation of rainfed land to produce staple food crops for subsistence. Only 13,000 ha of a total of 61,000 ha irrigated land is held by smallholders. Crops are mainly maize, cassava, sweet potatoes, legumes (mainly dry beans) and other vegetables. Most of the crop is consumed locally. Smallholders also cultivate mostly by hand, but use in recent years more intensive production systems including hybrid maize, fertiliser and other inputs. As a result they have higher yields of both food crops and cash crops such as sun and air dried tobacco, cotton, maize, millet and rice. Estates tend to concentrate on producing cash crops, mainly flue-cured tobacco, but also tea, coffee, sugarcane and cotton.

Soil loss and declining soil fertility continue to be one of the major environmental problems facing the country. Continuous cropping, using fire as a land clearance tool, along with inadequate replacement of nutrients and composting have led to the reduction in crop yields as the inherent soil fertility is exhausted. During the 1960s, unfertilised local maize on average yielded 1,700 kg/ha. Yields have fallen to a national average of below 1000kg/ha in this decade. The response of maize to fertiliser has also declined due to the destruction of the soil structure by erosion (EAD 2002).

Environmental pressures from small-holder farmers mainly comes from demand for land and timber and thatching materials for building tobacco sheds, while the larger tobacco estates require large amounts of fuel-wood for heating barns in the flue-curing process. Farmers are known to send trucks great distances in search of fuelwood, and have only recently resorted to growing timber on their farms for tobacco curing.

The major impacts of unsuitable cropping practices and use of marginal lands have been through severe soil erosion and sedimentation of streams and rivers. Unsuitable cropping strategies have resulted in further land degradation, mainly due to changes in the hydrological regime on denuded water catchment areas, rainfall runoff increasing at the expense of rainfall infiltration into soils, with the result of flash floods in low-lying areas, with increasing soil temperatures and increasing aridity in upland soils. This creates a vicious cycle as native vegetation then struggles to re-establish. Furthermore, the increased

rainfall runoff carries fertilisers and pesticides into the main rivers and water bodies including Lake Malawi, with associated impacts on pelagic fish stocks.

Livestock and range productivity are mainly limited by the lack of available grazing land, and livestock numbers are therefore quite low. The impacts are consequently restricted to a few areas where livestock population densities are low and crop production is also relatively low. As cropping extends further into grazing areas, the numbers of ruminant livestock, especially cattle, continue to decrease. Livestock production, and the consumption of animal products are very low, contributing ~7% to annual GDP. Exports of animals and animal products virtually non-existent and about half the dairy products consumed in Malawi are imported (Noragric 2005). Livestock farming is not restricted to cattle, however, and rural people are now turning to semi-intensive smallstock and poultry production to raise additional income.

Cattle farmers are most vulnerable, in terms of impacts on their environment, however, because they are restricted mainly to low lying wetland areas and/or marginal forest areas until field crops have been harvested. When cropland becomes seasonally available there is very little grass for cattle to eat. Meanwhile, wetlands and forested areas are not really suitable for grazing because hill-slopes begin to erode along animal paths, creating severe gully erosion, further impacting on soil moisture regimes and accelerating land degradation. In wetland areas, cattle are prone to stomach and liver worm infestations (with negative economic implications), while trampling and grazing around wetland areas reduces the ecological function of wetlands of enhancing water quality by filtering out nutrients and suspended solids. Wetland encroachment also reduces their capacity to mitigate seasonal flooding and reduces the habitat of many animals, fish, amphibians, reptiles and insects, and so has a severe negative impact on biodiversity.

- Forest exploitation (timber and non timber products)

Deforestation and associated soil degradation are the major environmental problems in Malawi. Forestry resources are under immense pressure due to agricultural expansion and the growing demand for wood energy for both domestic and industrial use and construction materials. Forest resources in customary land are close to extinction, with only 7% wooded areas remaining. Forest resources are mainly provided by 88 forest reserves covering ~918,451 ha of indigenous forest and exotic forestry plantation (pine and eucalyptus) covering ~97,000 ha under the management of the forestry department. The private sector has established a total 35,539 ha plantations. The annual production of wood is largely under the permanent increasing demand for domestic fire wood (see energy), charcoal production for urban areas, tobacco and fish curing, beer brewing and construction material especially brick burning, resulting in increasing degradation of forestry resources. About 52,000 ha corresponding to 2.8% are deforested every year (EAD 2005) and due to lack of

control encroachment includes all types of protected areas (forest reserve, national parks, wildlife reserves).

Most tobacco estates have failed to comply with the obligatory establishment of a wood-lot on 10% of their estate area, and most of the wood for tobacco leaf curing is from indigenous forest.

Table 1: Deforestation between 1972 and 1992 for both indigenous and plantation forests

Region	1972 total forest area (ha)	1992 total forest area (ha)	Total forest lost (ha)
North	1,507,266	470,238	1,037,028
Central	1,488,110	777,217	710,893
South	1,404,510	650,860	753,650
Total	4,399,886	1,898,315	2,501,571

Source: Forestry Department, 1993

Forestry productivity, estimated at 0.8 – 1.2 Mm³/ha for indigenous forests and 14Mm³/ha for plantations, is further reduced by bushfires. Fire remains one of the greatest threats to forestry, with millions of Kwacha literally going up in smoke. Most fires are started by people, as a management tool to clear fields and grasslands for cattle, for honey harvests, for hunting small animals, and then get out of control, with disastrous results (155 fires damaged ~13,000 ha at an estimated cost of MWK104 million, in 1995 alone).

Since 1984, three exotic aphid pests have invaded pine and cypress plantations throughout Malawi. It is estimated that the pine needle pest was responsible for 30% loss of wood production in pine plantations in 1989. Wood loss due to pine woolly aphid was, by December 1990, valued at US\$ 2.6 million in standing crop. The third exotic aphid is the cypress aphid responsible for the death of cypress hedges throughout the country.

Afforestation programs have taken place in government plantations since 1950, and since the late 1980's on community land. Sometimes environmental aspects are neglected and indigenous forests have been cleared for exotic plantations of eucalyptus with associated negative impact on soils and hydrology. A lack of maintenance and ownership for community plantations reduces the survival rates of the planted trees often to less than 60%. Only in recent years has GoM started to implement the PPP and cooperative management systems in the forestry sector to increase ownership and responsibility for forest resources.

Forests are also a source of non-timber forest products (NTFPs). These include edible mushrooms, cane furniture, ornamental flowers, thatching grass, wildlife, fruits, honey, insects, etc. Most of NTFPs are consumed or traded locally by households. As a NTFP, mushrooms are consumed and sold and the socio-economic contribution has been valued

close to that for fuelwood. NTFP constitute valuable resources with a commercial value with some products having potential on the international markets. These products are cane furniture, mats, tables, chairs, toys and baskets). It is estimated that 26,162 tonnes of cane furniture and other craft products are produced annually.

Increasing attention is being focused on NTFP as sources of alternative or complementary sources of income. The major constraints remain inadequate information on utilisation, management and marketing of NTFPs and the risk of over exploitation of these resources as a consequence.

- Hunting

Hunting is permitted in Malawi, but is restricted to two vermin species: Baboon (*Papio ursinus*), and bush pig (*Potamochoerus porcus*), and to a limited number of subsistence hunting permits for duiker (*Sylvicapra grimmia*), warthog (*Phacochoerus aethiopicus*) and bushbuck (*Tragelaphus scriptus*). The hunting licences are available for a nominal fee from local Wildlife Offices within Malawi.

Baboon and bush pig are common in Malawi, particularly around natural forests, reserves and forested hills. They are considered as vermin due to the damage they cause in croplands.

The three Game Species permitted by licence are no longer commonly found outside of Game and Forest Reserves and National Parks, except for in the areas around parks and places with low human density population mainly due to difficulty of access. Hunting success rates are reported to be generally low, due to the very few animals found, and possibly to the lack of enforcement in reporting hunting returns on the licences at the end of each season.

Bird hunting is permitted by licence. Bird trapping around Lake Chilwa has become a major economic activity with over 1.2 million birds killed annually, although the lake was declared Malawi's first Ramsar site in 1997. The birds are trapped even in the nesting season, however, and this is not sustainable. In response to this 13 waterfowl committees have been established in 2001. Overall, the natural habitats – Lake Chilwa, Mpasanjoka Dambo, Boadzulu Island (Lake Malawi), Elephant Marsh and the Shire River in Liwonde National Park are inhabited by large numbers of waterfowl. The Mpasanjoka Dambo shows a declining trend over the years.

Illegal hunting, or poaching, is reported to be common among local communities for subsistence purposes, but uncommon at the commercial level. Again, this is mainly because of low animal numbers and difficulty in hunting them. The low density of animals in customary land stimulates poaching in the protected areas including national parks and wild

life reserves. Increasing poaching principally by wire snaring has significantly reduced the population of nyala, waterbuck and sable antelopes in Kasungu, Liwonde, Lengwe National Park and Majete wild life reserve. Elephant poaching using firearms introduced by Mozambican refugees in the 1980- 90's has reduced the population to a vulnerable status (EAD 2002).

The biggest pressure on wildlife biodiversity is through destruction of habitat by forest clearing for wood, charcoal, timber and for subsistence agriculture in traditionally marginal production areas.

Recent regulations have strengthened the DNPW's authority with regard to law enforcement, but staff numbers are low and the success rate of catching and prosecuting poachers is very low. Additionally, the experience of countries in the region is that wildlife conservation and protection is more frequently achieved through community participation methods than through law enforcement and prosecution.

- Fisheries

The Fisheries sector is extremely important to the national economy that provides employment, food, rural income, import substitution and biodiversity. It directly employs 57,854 people (2005) and indirectly provides a livelihood to ~300,000 people through fish processing, marketing, boat building and engine repairs. The increase in numbers of fishermen and crew members grew by 15% and 20% respectively between 1999 and 2003. The average annual catch is ~50,000 metric tons/yr, and in 2004 the sector contributed 4% of GDP. Total catch contributions are: Lake Malawi with over 50%, Lake Chilwa (20%), Lake Malombe (13%), the Shire River (10%) and 7% from other lakes and rivers.

Artisanal fisheries located mainly in rivers and inshore areas of the lakes (depth less than 50 m) dominate the sector, with 85 - 95% of fish catches. Aquaculture and fish farming are not yet well developed with ~4,600 fish farmers owning ~9,500 small fish ponds. Pond production is increasing but still very low (226 tons in 1995, 800 tons in 2002), at less than 1% of total fish production. Aquaculture has been identified as a means of increasing rural income (IGAs) and reducing environmental pressures on marginal land.

Fish provides 60 – 70% of animal protein intake by the population but fish supply per capita has steadily fallen from 12, 9 kg/yr (1976) to 6,4 kg/yr (2003) due to high population growth, growing demand, and declining production caused by dramatic over-fishing, in the traditional artisanal fishing areas. Deep water resources are estimated of about 35,000 tons/yr but are under-exploited due to lack of appropriate technology and capital (one company has the necessary equipment).

Over-fishing and the use of inappropriate fishing methods cause a reduction in size and age of catch, altering the species composition and biodiversity of the stock, particularly with *Chambo*, *Utaka* and other small cichlid species. Non-sustainable fishing methods include use of nets with small mesh size and mosquito netting, fish traps at river outlets, fishing by blocking rivers and netting in breeding grounds, and during breeding seasons. Existing fisheries regulations are rarely respected and the destruction of breeding grounds has significantly reduced production capacity. The most dramatic case, demonstrating this trend, has been that of the *Ntchila* (*Labeo mesops*), which was the major commercial species in Malawi in the 1950s, but is now threatened with extinction. Similarly, gravel and grass spawning species are suffering due to loss of habitat.

Fish habitats are also negatively affected by environmental problems from other human activities: reduction in water flows and increased sedimentation from agricultural and deforestation activities, water pollution by human and agricultural waste, sand/sediment runoff and industrial waste, and the prevention of fish migration in rivers to breeding areas because of construction of weirs and other obstructions. In addition aquatic invasive plants are increasing and reduce catches and reproduction. Water hyacinth (*Eichornia crassipes*) and *Azolla* (an indicator of high fertiliser runoff from agricultural areas) have become a problem in rivers and lakes in the districts of Nsanje, Chikwawa, Blantyre, Mulanje, Zomba, Mangochi, Lilongwe, Nkhotakota, Karonga and Salima.

These problems call for urgent measures to protect the sustainability of the resource to avoid damage and/or loss of this important nutrition and income generating source. Initial measures for more sustainable management of fish stocks have been implemented with the introduction of cooperative management systems (BVC Beach Village Committees) in recent years, but they currently cannot respond to the increasing demand of fish.

- Mining

Malawi's mining sector contributes less than 3% to the GDP and is reported to be under-exploited (EAD 2002, MGDS 2006), but there are economic incentives and MGDS plans for boosting this sector. The main products are: cement, coal (~90,000t/annum), quarry stone (110,506m³) and gravels for construction, semi-precious stones, ornamental granites (dimension stone), ceramic clays, terrazzo, lime for construction and for agriculture, and heavy mineral sands. There are known reserves of radioactive minerals and phosphates (fertiliser manufacturing) in Malawi, with ongoing economic feasibility studies on possible exploitation of these resources.

Mining for construction materials such as sand and clay for bricks and lime for cement (with additional demands on fuelwood for brick-making) is localised, but is increasing with annual growth rates of the construction sector of 10,4% to 14,1% since 2002 (MEDP 2006).

It has severe negative environmental impacts affecting land systems and agricultural productivity, with river banks collapse affecting sedimentation/hydrology/ river function, and other knock-on impacts (see energy, water and fisheries sections). Sand and gravel extraction also leaves large voids that provide an environment for disease vectors and waterborne pathogens and disrupt fish breeding grounds where sand is mined from rivers and beaches. Open quarries are also rarely rehabilitated and leave aesthetically unsightly scars on the landscape.

Cement-making is the second greatest contributor to GHGEs in Malawi, after agricultural related practices (see energy). While underground mining requires timber props and therefore results in localised deforestation around some coal mining areas.

Bauxite reserves exist on Mulanje Mountain, but extraction poses a major threat to the environment and to the Tourist Industry.

Other environmental issues related to mining include creation of noise, dust, air pollution from furnaces, and effluent by-products. Due to the highly localised and very low levels of activity, however, these impacts are currently very low.

- Water use and management

Malawi is endowed with relatively vast water resources while only 5.8% of the annual renewable water resources are used (FAO, 2006). Water availability, quantity and quality vary greatly according to seasonal and regional differences. Meanwhile water extraction for agricultural and domestic purposes has increased over the last decade due to socio-economic development and population growth. Agricultural irrigation is still the major water-extracting sector at 80.6%, followed by the domestic and municipal water supplies at 14.7%, and industry at 4.75% (FAO, 2006).

Water resources have been significantly degraded due to increased siltation in rivers and reservoirs, mainly due to increased and inappropriate agricultural practices. This is worst in the areas under increasing population pressure, where there is severe deforestation, soil erosion and cultivation of riverbanks, marginal and other fragile areas. Rivers such as the North Rukuru and Linthipe Rivers now carry large quantities of sediment and suspended soils. The changes in hydrological regimes and waterborne sediment levels lead to greater incidences of flooding, and crop and land losses, especially in the Lakeshore regions and the Lower Shire in Chikwawa and Nsanje Districts.

The area under irrigation development has quadrupled in the country over the past four decades, and water abstraction has increased by approximately the same amount. The impact of permanent soil water-logging is still limited, but water-related vector-borne

diseases such as malaria, typhoid, cholera and bilharzia prevail around the irrigation schemes in Malawi and insect attacks have increased.

Domestic water consumption has been steadily rising in the districts. Rural gravity-fed piped water supply schemes have increased from a population coverage of 9,000 in 1969 to 2,382,800 in 2000 and the number of schemes has increased from 1 to 66 over the period. The average daily urban water supply production has increased by 99.8% between 1983 and 2003 (Blantyre) and by 92.3% between 1990 and 2003 (Lilongwe). Up to 27,025 new rural community water points (boreholes and shallow wells) have been installed from 1998 to 2004 (EAD 2005). Approximately 67% of the Malawian population currently has access to safe water supply, but there has been a marked decrease in water quality, mainly in urban areas. Another major constraint is that only 65% of boreholes are properly functioning.

Important dams have been constructed to ensure municipal water supplies. There are now nine major dams of slightly over 43Mm³ storage capacity. Two of these were constructed near Blantyre in the 1950s for hydroelectric power. In addition there are 700 - 750 small dams with ~64Mm³ total storage capacity. Environmentally, dams modify water flow and overall hydrology regime of the rivers and although EIAs are required, even in recent times (Mulunguzi dam in Zomba 2001, and on the Bua River) EIAs were not done correctly, and environmental concerns not adequately addressed, resulting in serious siltation and other environmental problems in the reservoirs (EAD, 2002).

Generally both surface water and groundwater quality are still acceptable for human consumption but the major rivers show increasing pollution. Nitrate concentrations are still below the WHO guideline standards in all rivers, but the Mudi and Lingadzi Rivers have unacceptably high Biological Oxygen Demand (BOD) levels, while the North Rukuru, South Rukuru, Linthipe and Bua rivers all have suspended solids concentrations well above the Water Resources Board's acceptable standards.

Water resources contamination is a current problem due to poor sanitation and improper disposal of wastes, agro-chemicals and effluent from industries, hospitals and other institutions. Raw sewerage escapes into river systems that supply drinking water for downstream communities, particularly the Mudi and Limbe rivers in Blantyre. The results have been outbreaks of communicable diseases such as diarrhoea and cholera. In the past decade, only 5.5% of the total population (MHIS, 1995) have had access to adequate sanitation, while 75% of rivers had a coliform count above 500/100ml (indicating high faecal pollution and a major health risk). Other forms of water pollution include agriculture chemicals (fertilisers and pesticides), and increased agricultural activity at smallholder and estate sector level. Dangerous chemicals and pesticides were used extensively in 1970's-80s, some of which (e.g. DDT) still have residual effects. The result has been an increase in

salinisation and eutrophication of water bodies in the country, the latter resulting in algal growth outbursts and suffocation of water systems. Eutrophication has also encouraged the spread of exotic aquatic plants which are now a serious problem many smaller water bodies and in shallow areas in Lake Malawi.

- Energy production and use

Malawi's energy needs are met by a balance of 93% fuelwood, 3.5% petroleum, 2.3% electricity, 1.0% coal and 0.2% other biomass fuels. Rural households account for 60% of all energy consumption, with urban households (10%), the tea industry and tobacco estates (20%), small scale industries (8%) and urban industries (2%). By 1992 it was estimated that the annual wood consumption of 5.2 Mm³ exceeded sustainable supply by 3.3 Mm³. The situation is aggravated by population growth, expansion of the estate sector, rampant poverty, and ever-increasing demand for charcoal in urban areas. The extremely high reliance on biomass for energy needs imposes heavy strains on the country's forest resources and fuelwood demand is one of the major causes of deforestation and erosion in Malawi.

Hydro-electric power is concentrated on the Shire River with an estimated total capacity of ~600 Megawatts (MW). Of the country's installed capacity of 304MW, 91% is hydro (284.5 MW in 2005) and 9% is thermal, but this services only about 4% of the population. Access to the public supply system is estimated at only 30% of the urban population and < 1% of the rural population. According to the power demand forecast (394 MW in 2010, 547 MW in 2015, and 767 MW in 2020) ESCOM will not be able to meet incremental demand after 2006 unless additional capacity is installed.

The Shire River has experienced flows below the volumes of 170m³/s required for sustained hydro-electric power production. The erosion and sediment loads carried down from the catchment areas has been due to increasing land-clearing for agriculture and poor agricultural practices in the catchment areas of the Shire and many other rivers that have potential hydro-electric power plant sites. Silt and sediments loads have also contributed to in rapid wear and tear of power generation equipment, with considerable costs for silt-removal and repairs. Additional hydropower will require new dams, but these will have specific negative environmental impacts. The alternative (currently under review) is to connect to the electricity grid supply from Cabora Bassa in Mozambique.

Malawi is a non-oil producing country and imports about 97% of refined petroleum products. Locally-produced ethanol is blended with petrol to make up the remaining 3%. Petroleum products mainly contribute to transport (50%) and industry (40%), with only 10% for household needs. Petrol and diesel consumption has been increasing since 2000 (MEDP 2006) and contributes to air pollution.

The Mchenga coal mine is the only operating coal mine in the country, with increasing production (~51,870 tons in 2005). The main consumers in Malawi are the tobacco, sugar, beer brewing and textile industries. Coal has not yet been adopted for household use, and although renewable alternative energy Programs exist they've had no significant impact on the national energy balance.

2.2.2 Urban areas and industries

- Urbanisation and infrastructure

Urbanisation rates in Malawi were ~14% in 1998, with 11% accounted for the four main urban areas of Blantyre, Lilongwe, Mzuzu and Zomba. Since the mid 1990's, however, the countrywide trend is towards increased urban migration, and average urban population growth is estimated at 6.3%/yr. The 2004 SOER estimates 24% urban population, over 1.4 million people (ADB, 2002). In urban areas, acute problems exist, with 60-70% of the total population living in traditional housing areas and unplanned squatter settlements where basic infrastructure and services such as roads, water and sewerage are inadequate or lacking. The formal sector cannot cope with the demand for housing and accompanying services, and, with estimated squatters numbers increasing from 3% to 5% (1988-1998), and the true number expected be higher due to people not counted in the census.

Table 2: Malawi Urban Population Growth, 1966-1998

Centre	1966	1977	1987	1998
Blantyre	109, 461	219,011	333, 120	502, 053
Lilongwe	19,425	98,718	223, 318	440, 471
Mzuzu	8,490	16,108	44, 217	86,980
Zomba	19, 666	24, 234	43,250	65,915
Others	102, 958	200,929	269,492	298, 016
Malawi	260,000	539,000	853,390	1,435, 436

Source: NSO: Reports for 1977, 1987 & 1998 Population and Housing Censuses

The extremes of urban squalor and deprivation in the peri-urban and high density slum areas, combined with massive population growth make it extremely important to address the urban sanitation problems for the future prosperity of Malawi and its people. Poor sanitation conditions in urban areas encourage the rapid spread of communicable diseases such as tuberculosis, diarrhoea. Frequent outbreaks of cholera, especially in the country's main commercial Capital Blantyre emphasise this point. Urban Land Use Planning exist in the major urban areas like Blantyre, Lilongwe, Zomba and Mzuzu, which have Structure Plans and in smaller towns which have Outline Zoning Plans, but these plans are rarely respected and uncontrolled settlement takes place - often in environmentally sensitive, inappropriate areas like riversides and catchment areas. Urban planning often neglects environmental

aspects and pollution of surface water resources is common during raining season due to surface run off of polluted areas (markets near to rivers, THAs and squatters with poor sanitary facilities).

- Industries and private sector

Industry plays a minor role in the economy of Malawi's predominantly agrarian society. Small and medium-scale industries are concentrated in urban areas, Lilongwe, Blantyre and to a lesser extent in Mzuzu, with individual agro-processing factories located on estates around the country. The main industrial sectors are construction, clothing, footwear and textiles, and food and beverages (Coca Cola and Carlsberg Breweries). There were 392 registered industries in Malawi in 2002 (EAD, 2002).

Agro-processing industries contribute largely to the economy with abattoirs, tobacco, tea, sugar, cotton, soy-bean, sunflower, tomato and fruit processing. Effluent from the main abattoirs located in urban areas further impacts on already overloaded City Sanitation Works (see sanitation). The availability of raw materials for agro-processing, however, is affected by climate (mainly drought and floods, which are indirect impacts from land degradation). Food fortification (supplements) processing (vegetable oils and proteins), is a recent introduction in the agro-processing sector.

Other industries include the manufacture and distribution of fertilisers, cement (see Mining), agro-chemicals and household chemicals, metal work, printing, publishing and packaging (paper and plastics). In the cities, most industries are located within Industrial Areas.

Uncontrolled fuel spillages around fuel stations are a concern to the EAD. There are also moves to develop a bio-fuels sector (see Energy) and the use of this technology may help to reduce the pressure on forest resources, but it is still a long time before this sector can be fully integrated.

Industry has a significant draw-down on electricity and water, as well as the potential to pollute the ground and waterways with industrial effluent, and the atmosphere with smoke and heat. Some bigger private sector companies are currently attempting to develop and adhere to industrial standards such as ISO14001, the Fertiliser and the Pesticides Act, but environmental issues are neglected by most of the small and medium size companies.

Key problem areas related to the environmental impacts of industry are the lack of capacity, legislation, and of incentives for industries to develop appropriate waste disposal methodologies.

Tourism is a separate form of industry, with few major environmental impacts that are mostly localised, such as unregulated developments, localised draw-down on resources and other impacts similar to those experienced under urban development relating to sanitation and waste management. In Malawi, tourism is still under-developed and is predominantly nature-based. The result of this is that most developments are established with consideration of environmental conditions.

- Waste water and effluent management

Human waste disposal and management is generally very poor in Malawi. Waste water management plans are lacking or inappropriate and sewerage urban effluent enters river systems that are also sources of drinking water for downstream communities. This results in outbreaks of communicable diseases, especially diarrhoea and cholera. In 1996, only 6% (MSIS, 1996) of the total population had access to adequate sanitation, with 23% access in urban areas and only 4% in rural areas. The extremely low figure is attributed to the use of traditional pit latrines as an alternative, while these are considered to be an unsafe form of sanitation.

Table 3: Percentage of wastewater treatment in major centres in Malawi

Urban centre	% of wastewater undergoing some form of treatment
Blantyre	12
Lilongwe	30
Mzuzu	20
Zomba	0

Source: UNCHS, 1996

The five major urban centres (Blantyre, Lilongwe, Liwonde, Mzuzu, and Zomba) have off-site sewage systems but only 15% of the population is connected to waterborne sewerage and 15% to septic tanks (NEAP 1994). The old sewage systems frequently break down at treatment plants and sewer lines blockages occur due to poor maintenance and a lack of spare parts, improper design of some sections, and also lack of public awareness on proper use of the sewerage systems. Sanitation has recently become a major cause of concern in THAs and squatter areas, especially in major urban areas. Outbreaks of cholera and other waterborne diseases from poor sanitation have caused national alarm.

Industrial effluent is usually collected in septic tanks or discharged into the sewerage systems, and pre-treatment of industrial waste water is uncommon. The City assemblies do clear septic tanks but very little waste water is treated in any way before being discharged to rivers or open quarries. The lack of adequate waste water treatment causes today severe water pollution especially in Lilongwe (Chatuwa stream, Mchesi and Lilongwe Rivers) and Blantyre (Mudi, Naperi, Limbe).

- Solid waste disposal and management

Inadequate collection and unmanaged disposal of solid waste present a growing environmental problem especially in urban and industrial areas. Uncollected refuse dumped in public areas or in waterways contributes to the spread of disease and water pollution. Waste materials are discarded in urban areas, as they are considered to be the responsibility of the local authority. This includes household rubbish, commercial refuse, construction and demolition debris, street and drainage cleaning refuse, abandoned vehicles and sanitation residues. The table below give the rates used in the 2002 Sanitation Study for solid waste generation in 1995

With an urban population of approximately 1.4 million (2002), around 1.1 tonnes of solid waste is generated in Malawi's urban areas every day. Collection rates for solid waste are still low in Lilongwe, Blantyre, Mzuzu and Zomba, and most of the collected waste is disposed in sanitary landfills or open dumps without treatment or recycling.

Table 4: Solid waste generation rates in 1995

Urban centre	Estimated population	Total waste	Waste collected	% Waste collected
Lilongwe	354,582	102,698	31,200	30
Blantyre	444,365	118,157	33,500	28
Mzuzu	64,240	25,464	2,080	8
Zomba	56,814	22,520	1,800	8

Source: Malawi Social Indicators Survey (In EAD 1998)

Due to low maintenance and non-replacement of facilities by urban authorities, the waste collecting rates have decreased. In Lilongwe, the annual waste collection dropped from 6,000t/year (1991) to 4,000t/year (1997), and 77% of waste generated in urban areas is not properly managed (EAD 2005) throughout the country.

Similarly, in district centres, the capacity to undertake solid waste management is low, and only a few towns have designated landfill sites built to appropriate engineering design standards. In many areas waste is usually dumped in an *ad hoc* fashion in pits outside the urban area where children scavenge and rats, cockroaches and flies proliferate.

In most cases, industrial solid waste is handled in the same way as household solid waste due to lack of adequate refuse collection, disposal services and waste management plans. Industries in the four major towns are the main polluters, producing thousands of tons waste every year, and with increasing quantity, complexity and toxicity. The authorities' capacity to ensure that industry obeys solid waste management regulations are very low and waste disposal is mostly uncontrolled.

Hazardous waste generated by health facilities in urban areas is usually incinerated or buried on the premises. The amounts of hazardous waste generated have not been monitored, and

no impact assessment conducted on the disposal methods for this type of waste (UEMP, 2002). Some efforts have recently been undertaken, however, and it is now standard practice for health facilities to separate their solid waste into categories for appropriate disposal (EAD, pers. comm. Aug, 2006).

- Atmospheric emissions

Air pollution levels do not yet pose any mayor threat to ecosystems. Localized corrosion of some material is evident but no impacts on human and animal health have so far been recorded. Studies around the Chungalume cement factory, however, had indicated some impacts of air pollution on agriculture but these were not quantified. There is generally limited information or data available. The one recording station that used to monitor air pollution is no longer functioning, although new monitoring equipment is now being installed in critical areas (EAD, pers. com. Aug 2006).

Inventories of greenhouse gases have been carried out at national level in 1997 and 2002 (based on 1990 and 1994 data) to assess the contribution of various sectors to greenhouse gases in Malawi. Generally in major urban areas gaseous emissions from industries, car exhaust fumes and burning of old tyres are the major the air pollutants. The number of new vehicles registered annually has increased over the years and fuel imports, mainly diesel (increased 15 % last year), have increased from 248,545 to 258,527 litres since 2000 (MEDP 2006). With additional vehicle fumes introduced into the atmosphere and increases in urbanisation, mining, transport and industrialisation, air pollution could become a serious problem, especially in urban areas.

Other pollutants include smoke and haze especially in the rural areas, mostly due to bush fires and dust. Impacts from coal mines have been suspected but without any accompanying data.

2.2.3 Poverty and living conditions in human settlements

Official estimations put the current population at 12.3 million, with an annual population growth rate of 3%. This is a slight decline since the 1998 Population and Household Census with 3.7%. The decline is mainly associated with the return of Mozambican refugees and the impacts of HIV/AIDS, dropping the growth rate temporarily to 2%. The high population growth rate places pressure on all resources and also on the country's development and economic performance.

Malawi is consistently placed among the poorest 10% countries in the world according to the UNDP Human Development Index (HDI). Poverty is widespread and severe, with more than 65% of the population considered poor, and ~28% of the poor living in extreme

poverty. The level of inequality is highly significant with the richest 5% the population consuming more than 26% of GDP and the bottom 20% consuming about 4.5% of GDP. With the Gini coefficient for urban areas estimated at 0.52 and 0.37 for rural areas (MDG, 2006, from IHS 1998 figures), consumption is unequally distributed.

Poverty alleviation in Malawi has shown very little progress in the last decade. In 2005, about 6.3 million Malawians (~52.4% of the population) were estimated to be living below the Government's calculated poverty line of ~\$0.35/day, against a figure of 53.9% in 1998. About 22% of the population are ultra-poor and cannot afford to meet the minimum standard for daily-recommended food intake.

The economic growth rate in 2005, as for the previous 10 years, remained substantially below the level necessary (~6%) for an impact on poverty reduction in the country. Additionally, Malawi's economy is still highly vulnerable to weather conditions due to the dominance of the agriculture sector. Most smallholder households are unable to achieve adequate food and income security in an average year because of low agricultural productivity, and the situation is worsening with declining soil fertility and increasing land pressure. With the increasing uncertainty, calls for international Food Aid and Food Security Programs have been regularly needed in the past few years.

The non-income indices also point to pervasive poverty in the country. Health indicators are still generally poor with only 10% of health facilities delivering minimum levels of care. The maternal mortality ratio doubled over the period 1992-2000, and while recently showing a slight decline, it still remains one of the highest on the world at 1,120 per 100,000 live births. On a positive note, the prevalence of underweight children (< five y.o.) has dropped from 30% in 2000, to 22% in 2005. But, life expectancy (a key HDI indicator) dropped from 48 to <39 years over the period 1990 to 2005 (UNDP, 2005). This is mainly due to the high prevalence of HIV/AIDS (14% in 2005) in adults (15 to 49 years). The level has remained stable during the last 9 years, but the pandemic has had a major impact on smallholder food production as those affected are often not able to prepare the ground for planting and managing their crops. The high mortality rate of the economically active population has also resulted in increasing social problems (orphans, elderly people...) and reduced the capacity for improved performance in the production sector.

These general living conditions, characterized by widespread poverty and decreasing trends in food and economic security, create a dependence on short-term income generation instead of long-term, sustainable natural resource management.

2.3 Environment situation and trends

Despite the prevalence of HIV/AIDS, Malawi's population of ~12.3 million is expanding at the rate of about 3% per annum which means a doubling of the population in 20-25 years. This rapid development from a relatively small base in a country that is predominantly agrarian, places enormous pressure on the environment.

The main environmental impacts are loss of forest, soil degradation, loss of wetlands (*dambo*), and changes in river flow patterns, with flash floods and then long periods with low or zero flows. Water, soils and forests are all sectors which have a profound effect on the well-being of the rural population.

Forest biomass provides the main source of fuel for the vast majority of the population but householders need to search increasingly further a field to find adequate resources while the cleared land becomes prone to degradation. The country will experience a serious energy crisis if alternative energy resources or higher wood production cannot be developed in the very near future.

Increased population density means that traditional methods of shifting agriculture are no longer possible and farmers are either not aware of, or unwilling to adopt more modern production methods, with the result that soil erosion is widespread and fertility is no longer restored by natural processes.

The pressures from agriculture result in increasing encroachment on rivers and wetlands and the natural functions of these, such as clean water supply and fish habitats, coming under increasing threat. This is developing alarmingly and without rapid amelioration, will lead to a loss of indigenous forests, encroachment in game reserves and national parks, and associated loss of biodiversity.

The impacts will also be felt through further reductions in food security due to declining soil fertility and susceptibility to the already increasing incidence of natural disasters such as floods, landslides and crop failures due to decreasing soil fertility and unpredictable climate changes. Food security is also threatened due to impacts on fish populations that are a primary source of dietary protein. Changes in river flow patterns and decline in fish populations due to over-harvesting also have serious community health implications, as specific, but different fish species provide natural controls of water-associated diseases such as bilharzia and malaria (by eating the intermediate snail host, mosquito larvae, etc).

The combination of the destruction of natural landscapes and forests, and poaching in wildlife reserves is gradually destroying the tourism potential of Malawi, which has already

had serious negative consequences on the economy, particularly with regard to the decline of tourism on Lake Malawi due to increasing incidences of bilharzia and other waterborne diseases.

In urban areas the high population density and growth rates are exacerbated by high rural-urban immigration rates (~6%). With extreme poverty levels and the absence of proper urban infrastructure, this led to the development of slum areas in the major cities, an ever-increasing demand for wood fuel and water supplies, and increased generation of unmanaged urban refuse and sewerage. The rapidly deteriorating health and sanitary problems will soon impact on the living conditions in urban areas, resulting in rising government expenditures for social services especially health.

The impacts of environmental degradation are difficult to determine in terms of economic costs. To achieve this, however, useful indicators should include the costs of emergency food and disaster relief (including damage from floods and landslides), public health costs from water-borne diseases and respiratory problems, damage to the Hydro-electric power plant from soil sediment and aquatic plants, loss of production of inshore and river fish stocks, declining agricultural yields, and loss of timber resources from unmanaged bushfires)

2.4 Environmental Indicators

The International Environmental Sustainability Index (2005) evaluates Malawi in respect of: Air Quality, Water Quality, Biodiversity, Terrestrial Systems, Reducing Air Pollution, Reducing Water Stress, Reducing Ecosystem Stress, Reducing Waste & Consumption Pressures, Reducing Population Growth, Basic Human Sustenance, Environmental Health, Science and Technology, Capacity for Debate, Environmental Governance, Private Sector Responsiveness, Eco-Efficiency, Participation in International Cooperative Efforts, Reducing Greenhouse Gas Emissions and Reducing Transboundary Environmental Pressures. This classification with 76 individual variables is not well-adapted for Malawi, as only 53 are available here, and most data are not recorded on a regular base.

The importance and the need of environmental monitoring, the formulation of key indicators, and a national environmental information system (EIS) were initially expressed in the NEAP (1996). The first National State of Environment Report (SOER, 1998) proposed a list of 54 environmental indicators classed under forest depletion, human habitat degradation, population growth/poverty/health, soil and land degradation, and threat to biodiversity. A regular survey of the indicators proposed for the national environmental monitoring system, however, has never been implemented.

The MGDS (2006) proposes a list of key indicators including some environmental indicators, but the document concentrates on growth and development progress and is not well suited to evaluating environmental trends. At national level, environmental data collection is uncoordinated between the different Departments and Ministries, and data are often only available on a temporary basis while there is a donor-funded project in the sector.

Regular district and national level SOER reporting was planned, including monitoring, and a first series of reports for all districts was produced in 2001 to 2002, but these lack harmonised indicators and viable baseline data, and the proposed two-year reporting cycle has not occurred.

The key constraints to environmental information and knowledge management include:

- Inadequacy of systems and infrastructure for information generation, collection, processing and dissemination
- Inadequate financial and human capacities (qualification and number) to manage sustainable information and knowledge systems
- An evolving but yet unclear national policy to guide information and knowledge issues

The lack of viable baseline data and a harmonised monitoring system make it difficult to objectively assess environmental trends and the environmental impacts of activities and projects.

3. Environmental Policy, Legislative and Institutional Framework

3.1 Environmental institutional framework

The institutional framework for coordination of environmental management is set through the Environmental Management Act (1996). The framework is divided into 4 administrative levels: firstly Inter-Ministerial, with 6 Committees, secondly Inter-Departmental, with 2 units, 6 NRM Directorates, a steering committee and an NGO co-ordinating body. At the Inter-District and District Levels, there are 2 district committees working jointly with the 6 NRM Sectors, along with the Donors, NGOs and CBOs. The structural framework is shown in Annex 7.2. 7.

Within the Office of the President and Cabinet (OPC), the Cabinet Committee on Natural Resource Management & Environment (**CCNRME**) is the highest environmental policy and decision-making body, while the NCE (National Council for the Environment) and the TCE (Technical Committee on the Environment) are responsible for enabling the acts and policies by advising the Minister (MoNREA) on all matters and issues affecting the environment. This includes all measures needed to integrate environment into economic planning and development and to harmonise all the activities, plans and policies of lead agencies and NGOs.

The Environmental Affairs Department (**EAD**), constituted through the NEAP (1996) and the EMA is under the MoNREA, and is the central coordinating body for environmental issues. With 6 technical divisions, the EAD is central in coordinating cross-sectoral approaches, overseeing compliance with national standards, providing technical and information services, formulating overall environmental policies and facilitating the implementation of activities of all sectors working with NRME. It also facilitates decentralised environmental management, monitors the general state of environment, promotes CBNRM, capacity building for Environment District Officers and the DESC, and facilitates liaison between district and national institutions.

The EAD also provides the National Environmental Focal Point (**NEFP**) to coordinate information flows across sectors and between GoM, NGOs and the private sector. Contact individuals or EFPs have then been established in most line ministries. EAD liaises with the Natural Resource Management (**NRM**) Directorates, which are the Departments of Land Conservation (in MoA), Energy, Fisheries, Forestry, Land Husbandry, Mining, Water Resources and Wildlife. These Directorates are responsible for promoting sound environmental conservation, sustainable NRM utilisation.

The Department of Local Government (**DLG**) is the key institution in implementing the Local Government Act and the Decentralisation Policy, through the Environmental Unit, which assists and advises all local authorities on matters of environment and public health.

All the different institutions either work across departments and/or committees and then down through the administrative departments, or through parallel organisational structures (NGO and Donor support organisations) to the districts.

Under the current reporting structure on environmental issues, Central Government sets policies and guidelines for environmental planning, while the Environmental District and Area Officers (EDOs and EAOs), in collaboration with NGOs and CBOs, assist local villages and wider community areas in drawing up community action plans and regular environmental reports. Information and planning requirements collected at the lowest levels are then fed back into District Action Plans. The Action Plans are then referred back to Central Government for funding approval. This process also contributes when the local State of the Environment Reports (SOERs) and Environmental Action Plans (EAPs) are incorporated in the District and National level reports.

The District Commissioner's offices administer environmental funds and planning at the DA level which includes financial and budget allocations, quarterly accounts, and reports on budget expenditure.

The current Institutional Framework is highly complex due to the number and size of institutions involved in administering environmental affairs. There is confusion about responsibilities and a general lack of awareness of cross-cutting environmental issues and how to include them into project design. In addition, the delivery of environmental management services is fragmented across the various NRM sector ministries dealing with environmental issues, resulting in a lack of coordination.

- **Coordination**

The EAD Practical coordinates environmental issues, while policy is dealt with through irregular and ad hoc meetings held by the NEFPs and co-opted committee members. These meetings are held to refer matters raised in policy and legislation discussions, or to address issues raised from the sector departments, the EAD, or from the Districts. Regular coordinating meetings that include civil society representatives and donors exist in some sectors (agriculture, health, education, etc.), but not specifically for environmental issues.

Within the EAD, the District Environmental Affairs Unit (DEAU) coordinates between the EAD and the Districts and is the crucial link between the EAD and District environmental planning and management bodies. At District level, coordination is through the

Environmental District Officer (EDO) and NRM Committees, from where it passes down to the villages, communities and their support organisations.

In Urban areas, City Assemblies manage sanitation, solid waste, environmental health and parks, and City Water Boards, under the Regional Water Boards manage water supplies.

Environmental issues are now categorised as ‘cross-sectoral and underpinning’, while the responsibility for environment is given to people with little authority (and no specific training in EIA and environmental management) to enforce/ensure inclusion of them into District Planning.

- Civil society integration

In 1994, GOM initiated the inclusion of civil society in addressing environmental issues and incorporated into the National Constitution in 1995. This allowed devolution of responsibilities to District Assemblies and was formalised in 2001. Currently, the District Assemblies are responsible for managing local development plans, ensuring the implementation of concrete environmental actions, and including EIA and environmental and natural resource utilisation programs by CBOs and NGOs.

This has been further encouraged by the formation of Community Based Natural Resource Management (CBNRM) groups and District Environmental Sub-Committees (DESCs). By 2002, over 120 communities nation-wide, had participated in environmental micro-projects, and 386 Beach Village Committees, 4,084 Village Natural Resource Management Committees, 10,170 Village Development Committees and 271 Area Development Committees had been formed to play a role in the co-management of natural resources.

It is important to note that the policy development process at national level includes NGOs, CBOs and Scientific Research Institutions. NGOs currently play a key, underpinning role in the support of District programs. The Malawi Environmental Endowment Trust (MEET) has been specifically established to assist local NGOs and CBOs to develop sustainable environmental and natural resource local level programs, and these are further supported by Donor Programs. Importantly, the EIA Association of Malawi has been formed using MEET funds, with the objective of providing civil society with the opportunity to draw up EIAs and to insist on their implementation in development projects.

Under the decentralisation process, there was an initial lack of understanding about the impact of environmental issues on civil society and rural livelihoods. Currently, there is still a lack of understanding of roles and responsibilities in environmental management at the village level, often resulting in expectancy that the GoM &/or Donors should pay for and manage everything.

- Capacities (human, finances)

Human capacity is generally constrained starting from Departmental level, right through to the District Level for most District Assemblies to village level. The Decentralisation Process appears to have been a process of devolution and divestment of responsibilities from Central Government, without providing enough support (human and financial resources) at District level. In the absence of technical staff and operating budgets, the District Assembly management system is currently failing.

The technical capacity within the environmental management system is lacking, and morale is very low, with virtually no operating budgets and key posts vacant. There is no DEAU officer in the EAD, and at the District level, EDOs are either absent, or their role is carried out by unqualified/untrained staff. In many Districts, the function of the EDO has now been attached to sector departments e.g. Agriculture, Forestry, Fisheries, or Wildlife, who are not specifically trained for this role.

Many ministries and departments are operating with less than 50% of the necessary staff, and these people often have double roles to cover for vacant positions. Under the initial decentralisation process, all 28 districts had an EDO, but in 2006, only 9 remain. District technical support has now been assumed by NGOs and CBOs, creating a series of parallel structures to the government. Community programs then become fixed to donor funds and funding periods. Without established technical capacity in a community at the end of the funding period, programs cannot be sustained and people revert to their previous livelihood strategies (resulting in environmental degradation).

There is very little management capacity at all levels, including NGOs, with communities not getting adequate support in learning to draw up action plans, bye-laws and other mechanisms that they need in the decentralisation process. As a result, local knowledge and practices have been omitted from community planning, Donor and NGO efforts duplicated, and community needs poorly targeted.

The key tasks of implementation, monitoring, control and coordination are also not assured at national level due to the lack of staff and/or training, especially in the 'brown environment' (waste water and solid waste management, air pollution control).

Research institutions are also not proactive enough in adapting student courses to deal with current issues and social and technical needs, so most graduates require extra training before they can take up a public service post. These institutions, meanwhile, lack finances to develop and sustain student courses and programs, to purchase facilities and equipment, and for staff development programs. Much of the research support is based on specific

development goals such as improved crop varieties and cropping techniques, rather than on holistic environmentally sound, holistic livelihood approaches.

At national level the requested budgets of the different departments are never fully allocated mainly resulting in reduced field activities such as control and supervision missions and surveys.

Financial capacity at District level is provided for environmental activities through the annual District Assembly budgeting process on the basis of financial requests for support for the District Action Plans, but key financial posts are vacant there. The result is a lack of information reaching the EAD and lack of continued financing until funds have been accounted for. Even when funds are available, they may be diverted for crisis management. Funds for new developments are also lacking, and Districts have neither equipment nor recurrent budgets to operate extension and maintenance operations. This results in rapid deterioration of infrastructure developments.

In urban areas, City Assemblies have to generate the majority of their own budget through taxes, paid services and other incomes. Due to a low number of paying clients and increasing urban environmental problems, the maintenance and extension of basic services are totally inadequate.

3.2 Environmental policy and legislation

The mandate for environmental policy is derived from the Constitution of Malawi, 1995. Section 13 (d) of this document provides the principles of national policy and states the environment principles:

- A) For managing the environment responsibly in order to prevent the degradation of the environment, provide a healthy living and working environment for the people of Malawi, accord full recognition to the rights of future generations by means of environmental protection, and to conserve and enhance the biological diversity of Malawi.
- B) To enhance the quality of life in rural communities, and to recognise rural standards of living as a key indicator of the success of government policies.

- National Policies, Strategies and Action Plans for the Environment

The guidelines were originally set through the National Environment Action Plan (NEAP, 1994) and further supported by the Environmental Support Program (ESP). The National Environmental Policy (NEP) and the Environmental Management Act (EMA, 1996) were adopted in support of the NEAP in 1996. The NEP was subsequently revised in 2003, and

will be periodically revised according to general development policies and goals adopted by Malawi.

Since 1996, a large number of sector policies related to environment have also been developed and implemented. These sector policies include agriculture, forestry, fisheries, water, land reform, land use and management, wildlife, irrigation, tourism (Annex 7.2. 1). More than 40 different isolated policies have been developed in the past few years for the agriculture sector alone. Across these, the NEAP identifies 9 key environmental issues: soil erosion, deforestation, water resources depletion and degradation, high population growth, depletion of fish stocks, threats to biodiversity, human habitat degradation, and climate change and air pollution.

This policy framework is very complex, however, and the documents rarely known about, except in the relevant departments and ministries. At national level, information exchange and circulation are already very slow, but when added to the weaknesses in implementation capacity, effective, Malawi's sustainable NRM program, is further impeded.

- Environmental Legislative Framework

The Environmental Legislation Framework is through the Environmental Management Act (No. 23, 1996, with current revisions waiting Cabinet approval in 2006). This is supported by the revised National Environmental Policy (2003) and through Policies, Acts and Master Plans established through related Ministries and/or Departments. These are further supported through the Decentralisation Policy (DP, 1988) and the Local Government Act (LGA, No. 42, 1998) through which certain powers of central government have been devolved.

The most appropriate regulations currently governing the environment are in the EMA and the Environmental Impact Assessment Guidelines (December 1997). These are supported by several acts and policies governing related sector ministries and departments (Annex 7.2. 1). The regulations have been elaborated and stipulate EIA, EMPs, and the respect of norms and standards covering environment and natural resources. The process is standardised, including the requirement for independent quality control and drawing of terms of reference for specific projects in collaboration with the EIA specialists in EAD, and with mandatory public consultation.

Currently EIAs are drawn up according to specific projects through EDO's NGOs and private sector (EIA Association of Malawi) and then reviewed by the EAD. Norms and standards are then set into contracts as local by-laws and licences are issued for use of natural resources.

The quality of EIAs is variable due to limited awareness of cross-cutting environmental themes, although ultimately overseen by EAD. Follow-up Environmental Management Plans, Audits and Monitoring are rarely carried out due to lack of manpower and resources, however, and licences are not set according to assessed regenerative resource availability, but according to demand. Additionally, licences are commonly abused, and norms and standards not met by contractors and/or local authorities. The lack of enforcement is mainly due to the lack of manpower and resources.

Meanwhile the National Judiciary appears unaware of the magnitude of environmentally unacceptable practices, and does not apply heavy enough penalties for offenders.

While most of the policies and strategies specifically include EIA, where there is conflict with economic growth aspects, environment may be purposely overlooked, particularly at a Ministerial Level. Furthermore some strategies and action plans within different departments that address common resources (particularly water for irrigation), are not harmonised, creating confusion and conflicts of interest across departments responsible for implementation.

- International treaties

Malawi is signatory to many International and Regional Treaties and Conventions concerning Environment and Natural Resources including biodiversity, climate change, desertification, migratory birds, plant protection, CITES and wetlands conservation (Annex 7.2. 5) These include regional agreements with neighbouring countries (Tanzania, Zambia and Mozambique, SADC) on shared watercourses, wildlife management and law enforcement, energy, mining, and forestry and fisheries.

These agreements have been implemented through Policies such as the NSSD (2004), adaptive planning studies on climate change (NAPA, 2005) and evaluations such as the Greenhouse Gas Emissions Study (GHGEs, 2003). They are also mainstreamed through strategic frameworks such as Vision 2020, the PRSP (2002), and the MGDS (2006).

There are currently few follow-ups and/or concrete actions aside from policy development, mainly due to a lack of priority within Government and a lack of resources in the technical departments concerned.

3.3 Integration of environmental concerns into the main economic sectors

The key environmental pressures identified in Chapter 2 are: soil degradation, deforestation, land tenure, degradation of surface and ground water, depletion of fish stock, threat to

biodiversity, climate variability, human habitat degradation (housing, waste, waste water and sanitation) and air pollution.

Currently, the main identified causes in natural resources and the environmental degradation are poverty and the lack of awareness of the synergies between the natural landscape and land productivity. The primary sector of agriculture is most affected by environmental degradation, but nearly all sectors are linked to the environment as shown in the matrix below.

GoM recognises these linkages and current policies guiding environmental affairs are entrenched in Malawi's Development Goals and broadly defined by: the Malawi Poverty Reduction Strategy Paper (MPRSP, 2002), the National Strategy for Sustainable Development (NSSD, 2004), the Economic Growth Strategy for Malawi (MEGS), and the Malawi Growth and Development Strategy (MGDS, 2006), which also plans monitoring and evaluation, in accordance with the M&E National Master Plan.

Table 5: Sector Influence on Environmental Issues

Environmental Pressures	Population Growth	Widespread Poverty	Deforestation, Encroachment	Land degradation	Land Tenure	Wetlands Degradation	Climate Variability	Waste Water, Management	Solid Waste Management	Air Pollution	Threats to Biodiversity	Threat to Fisheries
SECTOR												
Food security												
Roads and Works												
Agriculture												
Forestry												
Fisheries												
Livestock raising												
Mining												
Energy												
Industry												
Tourism												
Trade												
Education												
Health												
Water & Sanitation												
Justice Law & Order												
Accountability												
Decentralisation												
Public administration												

The importance of the environment to the economic sectors has only recently been prioritised in policy and planning. Most important of these is the non-sustainable use of land and natural resources in subsistence agriculture, and urgent implications to food security and social well-being. Currently subsistence agriculture, roads, energy and water are recognised as critical sectors for economic upgrading and have been targeted accordingly in the latest planning policy (MGDS, 2006).

The proposed medium-term outcome for environmental protection in the MGDS focuses on improving compliance with environment and natural resource management laws. To ensure that the MGDS is implemented in partnership, the Government will assist thematic teams to review progress. These teams will comprise ministries, civil society, private sector and donors. GoM will also improve donor coordination, with Donors and co-operating partners requested to align their support and activities to the MGDS. Finally, heavy financial investments will be needed to establish mechanisms and modalities to implement activities including development of public-private partnerships and to privatise appropriate sector departments and reduce GoM's recurrent monthly operating budgets. It includes recommendations to turn the EAD into an Environmental Protection Agency (EPA), subject to approval of the current revisions of the EMA (2006, now with Cabinet).

Currently, the core theme of conserving the Natural Resource Base (most specifically: fisheries, forestry, environmental protection and wildlife) falls under Theme 1 of the MGDS (Sustainable Economic Growth), with environment covered as a cross-sectoral theme. Meanwhile, the major goal of the NSSD is to ensure the inclusion of the decentralisation process, the Environmental Support Program (ESP), and the Poverty Reduction Strategy Paper (PRSP) into current and future development strategies and initiatives.

Under Objective 1 in the Agriculture Sector, the NSSD addresses land degradation through scaling up of proven technologies to arrest land degradation, improved soil fertility, improved water management and water use practices, and the establishment of innovative public-private partnerships to stimulate joint implementation of sustainable agricultural and natural resource conservation. Furthermore the GoM has accorded top priority to the implementation of the Land Reform Policy (2002) to reduce land pressure by strengthening land rights and land tenure security to encourage and to improve investments in the agricultural sector.

Under the MGDS the economic growth strategy in the next planning phase will also focus on specific sectors including irrigation agriculture, tourism, mining, integrated cotton industry, manufacturing, and agro-processing, plus infrastructural developments, mainly roads. The inclusion of these is briefly discussed below:

- Irrigation agriculture is promoted under the MGDS, but the issue of SEA has clearly been omitted from the planning. This may have severe, long-term negative environmental repercussions and failure in agriculture, especially in low-lying areas, without careful planning.
- Although Tourism is seen as a potential economic growth sector, it is mainly based on nature and wildlife. The economic and financial contributions of these, however, are not commonly recognised or addressed in economic analyses (MEPD 2006).
- Mining operations require EIA but there are no guidelines specific to mining in the EMA, while this sector is to be promoted under the MGDS.
- The cotton industry was working well for many years through to the late 1980s. GoM proposes to revive this industry, but considerable quantities of pesticides and other agrochemicals are needed for growing cotton, and the target growing areas are environmentally sensitive (Lakeshore, Phalombe Plain and Lower Shire River areas).
- Some companies in the industry sector have established environmental systems and certification under Environmental Certification under ISO14001 Management System. There are currently few economic incentives and advantages with this, however.
- Under the EMA, roads require EIA and follow-up EMP, and the MGDS recognises the impacts of roads due to an increase in draw-down of natural resources along the road corridor, particularly timber and charcoal.

Agro-processing often has environmental impacts, mainly from the by-products and effluents generated. These should be subjected to SEA and only located in suitable areas, but this policy appears to have been omitted in the country's strategy papers.

The main constraints to improved environmental regulations compliance (MGDS, 2006) include: inadequate environmental information systems, a limited legal mandate for coordination and limited capacity for enforcement, with few economic incentives for compliance, and finally, the conflicting service delivery in management of natural resources.

While the NSSD addresses land degradation through proposals for improved extensions services and the introduction of improved tillage and other agricultural practices, the reality is that there has been no technical and financial capacity to carry this through, and the NSSD is due for revision in 2007.

4. EU and other Donor Co-Operation with the Country from an Environmental Perspective

Malawi's government finances are heavily donor-dependent with up to 40% of the budget and over 80% of the development budget financed from donor grants and loans. The major donors actually working in environment, or closely linked sectors, in recent years are: EU, UK, Germany, Denmark, Norway, USAID, JICA, CIDA, WB, ADB and UN agencies (UNDP, WFP, FAO, IFAD, and UNICEF). There are many international NGOs operating in the country, mainly financed through donor funds. Several donors, including the EU, provide general budget support, but most assistance is implemented through donors' specific sector programs that correspond to the GoM's priorities formulated in the MPRSP, or more recently in the MGDS. SWAPs for the environment-related sectors, (mainly agriculture), are not yet developed. After environment-specific programs of the past decade (1990 - 2000), environmental issues are now generally embedded as cross-cutting issues in sector programs, mainly through agriculture/food security and poverty reduction, forestry, energy, water/sanitation, and infrastructure projects.

4.1 EC Co-operation from an environmental perspective

The only European donor currently active in environmental issues is the EU itself. DFID and GTZ had supported rural development/agriculture and energy programs until 2004, through support to the national budget, health, education and good governance. DANIDA supported the elaboration of the NSOERS and DSOER until 2002, but cooperation and funding has now stopped.

Environment has long been one of the focal sectors of the EU Programs in Malawi (EDF 7, EDF 8), and the EU is one of the most important donors in the sector. The ongoing EDF 9 once more focuses on agriculture/food security/natural resources, transport infrastructure and macro-economic support. Justice/governance, non-state actors, health and trade are also supported as non-focal sectors.

Several Programs fall into the agriculture/food security/ natural resource focal sector, and their budget lines have significant environment components mainly in sustainable agriculture, forestry and water/sanitation. Most of the Programs are the continuation of former successful long term projects like PROSCARP:

- Support to Implementation of the Malawi Land Reform Program
- 4th Micro-Projects Program (MPP4)
- Farm Income Diversification Program (FIDP)

- Improved Forest Management for Sustainable Livelihoods (IFMSL)
- Institutional Development across the Agro-Food Sector (IDAF)
- Sustainable Nutrition Rehabilitation Program (SNRP)
- Multi-Annual Food Security Program (MAFSP)
- 2002 Emergency Food Aid

These Programs involve more than 20 international NGOs who are active in environmentally related projects and thematic subjects in different districts.

The transport infrastructure focal sector mainly concerns road maintenance with limited direct environment components. Only the 'Income-Generating Public Works Program (IGPWP)' includes a large forestry component in addition to road maintenance. The budget support is not sector specific but focuses mostly on the social services (health, education).

Environmental aspects are generally included in the project preparation phase for new projects, and regular monitoring (mid-term reviews, reporting ...) is specific to the project objectives. This monitoring approach is so focussed on the specific targets, however, that secondary environmental effects may not be recognised. Environmental impact monitoring should be done through the districts, but their capacities are usually too weak or completely lacking, so the environmental impacts of EU co-operation projects (other than those foreseen in the intervention) are rarely recorded and difficult to evaluate. Recently, no EIA has been done because programs, (e.g. the road maintenance program), have been completely implemented and the partner structures (National Road Authority, GoM) are now responsible for ensuring that the EMP and other environmental regulations are implemented by the contractors, while SEA and/or environmental audits have never been done.

4.2 Co-operation funded by other agencies from an environmental perspective

A large number of Programs and projects with an environmental focus and/or anticipated impacts are funded by other donors (as mentioned above). These are mainly in the agriculture/food security, water supply, forestry and energy sector. Currently the MoA alone records actually 132 ongoing projects. A non-exhaustive list of the most important projects is provided in Annex 7.2. 9.

Coordination of donor's activities is generally done through Donor Committees in the different sectors. These are implemented and operational in several sectors including agriculture/food security (DCAFS), but fragmented and/or non-harmonised actions and approaches still limit the impact of the environmental mitigations. The DCAFS focuses on agriculture production while environmental issues are rarely targeted as a priority in the

meetings. A specific Donor Committee on environment was implemented some years ago under the leadership of USAID and later UNDP, but the leadership was handed to the EAD due to the general perception that the GoM is responsible for coordination and that donors can only support GoM policies. Now that environmental issues are mainly included in other sector programs, no meetings have been called by the MoNREA and coordination has halted.

The general impact of donor activities on environment is still limited, with the main outcome being poor sustainability of the outputs. Most of the projects are implemented through parallel structures that collapse after the project has finished, due to the lack of follow-up mechanisms. This approach also tends to concentrate the best human capacity into temporary, well-paid project jobs, resulting in the loss of capacity in the Central Government and local administration institutions. Where there is a donor funded program in the region, projects tend to be stop-start in nature. With short project planning periods (3-5 years, sometimes <6 months mainly for crisis-driven responses), there are frequent changes in direction and focus of projects and they also are not well adapted for environmental problems where significant impacts only occur in the medium to long term. Donor interventions have contributed to better environment awareness, however, and to a more or less complete legal framework and action plans, but the implementation of sustainable NRM is still at early stage and has not yet demonstrated improvements to the state of Malawi's environment.

In general, the direct support to combat environmental problems in the country has decreased with the transfer of environment and NRM programs into a cross-cutting issue. This is because little effort has been made to address the country's environmental-poverty nexus through effective environmental management and planning at different administrative levels.

5. Conclusions and Recommendations

5.1 Conclusions

The main conclusions of the precedent analyses can be summarised as follow:

Conclusion 1:

Widespread poverty, land pressure and population growth, absence of land tenure and associated lack of incentives to reinvest inland and natural resources, inadequate agricultural practices, deforestation, erosion, degradation of wetlands and biodiversity continue to be the principal threats to the natural resources. Environmental degradation is still increasing. The importance of key environmental pressures and their linkages on the predominantly agrarian society's natural resources are only well-understood and described in the upper administrative levels, while the concepts are only poorly understood and poorly implemented at the local level.

Conclusion 2:

The natural resource policies, strategies and acts are, in general, written and approved by GoM. Environmental issues are also integrated in sector and overall policies, including the NSSD. Some sector strategies need more harmonisation, while policies for waste, wastewater and air pollution are not yet approved. But the key problem is the extremely low level of implementation. This situation is due to two main problems:

- A. The institutional framework is too complicated, while effective management is difficult to achieve and many people do not understand the framework.
- B. The lack (mainly of human capacity) of strategic planning and coordination of national and donor activities, staff and finances for implementation and control, and technical equipment: all hampered by long delays in approving departmental staff vacancies by GoM's HRD Department.

Conclusion 3:

Decentralisation, transfer of competences and cooperative management systems are potential mechanisms to enhance more sustainable use of natural resources, but the tasks are not very clear and the process has not yet been accepted by all stakeholders. Implementation efforts are isolated and have not yet had any significant positive impact on sustainable NRM utilisation and conservation.

Conclusion 4:

The important function of environment monitoring and information sharing/circulation seems to be neglected. The absence of coordinated regular and viable data collection and

sharing, both through and across relevant departments, and the lack of an operating national Environmental Information System (EIS) prevent the objective evaluation of environmental impact (through SEA) of government and donor funded Programs.

Conclusion 5:

Increasing urban environmental problems are very poorly addressed by the government and the donor community.

5.2 Recommendations

[A code (1 or 2) has been given to each recommendation to separate specific recommendations for the Government of Malawi (1) and those that concern GoM together with the donor community (2).]

Institutional

- Simplify the institutional framework and reduce/eliminate parallel structures due to projects and un-harmonised national structures (Conclusion 2 B). (2)
- Promote SWAP and sector budget support especially in agriculture, forestry, water/irrigation, wildlife and fisheries, to harmonise and coordinate Programs and conduct Strategic Environmental Assessments (SEA) for the main (sub) sectors, especially irrigation and the GoM's identified growth sectors, specially tourism, mining, cotton industry, manufacturing and agro - processing. (Conclusion 2) (2)
- Give EAD an independent status as an Environmental Protection Agency (as per current EMA revisions), or attach it at a high institutional level (Office of the President & Cabinet) (Conclusion 2), and leverage GoM to be more efficient in staffing allocations (Conclusions 2B) (1)
- Clarify the roles and tasks of stakeholders, GoM, NGOs, CBOs, Private Sector, and Donors, in implementation, leaving GoM to focus on the core functions: policy, coordinating, regulations and control. Encourage the civil society to adopt management and implementation roles (Conclusions 2, 3 & 4) (1)
- Ensure the application of existing environmental laws and legislations by enforcement of human and financial capacities at decentralised and national level (Conclusion 1 to 5) (2)

Information/communication/monitoring

- Promote environmental awareness and understanding by sharing, circulation and transparency of environmental information and adapted explanatory material for the public (Conclusion 2, 3) (2)
- Identify simple standardised nationwide key indicators for environmental monitoring, and implement a National Environmental Information System able to translate the performance of sustainable development across all sectors. (Conclusion 4). (2) *Remark:*

Highly qualified technical assistance seems to be necessary for the development and implementation of an adapted system.

- Promote social programs to reduce the population growth rate, through health, and family planning education. (Conclusion 1) (2)

Decentralisation

- Promote the transfer of competence for natural resource management (human and financial capacities, cooperative management systems) to decentralised structures (Districts, CBOs) (Conclusion 1, 2, 3) (2)
- Promote local land use planning and holistic approaches concerning NRM (Conclusion 1, 2, 3) (2)
- Make sub funds available for environmental micro-projects and associated technical assistance at local level (District, CBO) and help them to develop self-financing mechanisms for NRM (Conclusion 1, 3) (2)

Rural development

- Encourage and support the land reform process to promote ownership and responsibility for natural resources, and to support the use of a wider range and better cultivation techniques for soil conservation (Conclusion 1) (2)
- Promote alternative income generation in rural areas using multiple resources (permaculture systems) for sustainable natural resource use, agriculture (including, forestry, fish-farming, small animals and poultry, NTFP production, agro-forestry/tree seedling nurseries and small scale agro-processing) combined with economics, management and financial training (Conclusion 1) (2)
- Promote household energy saving Programs to reduce firewood consumption and dependence on wood-energy in urban areas (alternative renewable/regenerating energy sources, low cost energy saving stoves, agricultural residues to make briquettes) (Conclusion 1) (2)

Urban development

- Ensure that urban services for waste and waste water management are effective and functional (Conclusion 1, 2 B, 5). (2)
- Support waste (solid and liquid) reducing and recycling by appropriate waste management systems and promote the use of proper technologies by adopting fiscal and other financial regulations (Conclusion 1, 5) (2)
- Urgently implement the ‘pollutant pays’ principal, starting with the most polluting industries and private sectors. (Conclusion 5) (1)
- Promote the integration of environmental aspects in urban planning and ensure the application of the plans (Conclusion 5) (1)

Biodiversity

Implement specific Programs for the protected areas (national parks, wildlife reserves) based on cooperative management systems to conserve biodiversity and conserve the potential for the tourist sector development (Conclusion 1, 2) (2)

EU specific recommendations

- Integrate environmental performance indicators (including secondary/tertiary impacts) and monitor these, and conduct general environmental audits for the focal sectors (general budget support, agriculture/food security, and transport/infrastructure). (Conclusion 4) Indicators could include:
 - The proportion of GoM's general budget allocation to environment
 - The proportion of District budgets used for environmental activities
 - Use of environmental indices of environmental degradation (ref Section 2.3)
- Support and direct the focus of priority sectors (agriculture and infrastructure) on implementing concrete environmentally appropriate actions referring to the agreed local plans (district or village level). (Conclusion 1)
- Integrate an urban infrastructure component in the public works Program (IGPWP) to support the city assemblies to solve sanitation and waste management problems (Conclusion 5)
- Continue the support to MAGIC and promote their integration into a National Environmental Information System. Encourage GoM Departments to share and provide access to their baseline information for its most effective use in the development process. (Conclusion 4)
- Facilitate access to EU finance mechanisms outside the EDF, especially budget line environment, ACP facilities for water and energy. (Conclusions 1,2 & 3)

Constraints to preparing the profile

There was one predominant constraint to preparing this profile: the lack of viable recent environmental data/studies and a central monitoring system. Most of the actual trends are estimations based on data from the 1990th. Considerable time was used to obtain some information of the actual situation and trends, scatted in different ministries, departments and donor structures. Mission time could have been better deployed on evaluation and appreciation of the information instead of having to seek it out.

6. Country Strategy Paper Environmental Annex Summary

A. State of the environment

About 85% of Malawi's estimated population of over 12.3 million live in rural areas and the total population is expected to double over 20 to 25 years. The average population density is 105 people/km², but higher, at ~143/km², in the southern region. There are over 6 million people farming as smallholders (75% of all farmer family members) on fragmented customary land and ~1/3rd of all agriculture taking place on land considered to be unsuitable for agriculture.

The over-riding environmental issue is land degradation resulting from population and land pressure, especially in the densely populated southern region. The key issues are: soil erosion, decreasing soil fertility and deforestation, and extreme climatic variations all affecting agricultural production and all linked sectors of the economy through a multiplier effect. Major problems currently are:

- Inappropriate land management practices and agriculture on unsuitable land, and widespread use of fertile soils, timber and firewood for brick production and construction.
- Very high soil erosion rates (10-43t/ha/yr) negatively affecting services such as water supplies, fisheries, lake and river transport, electricity generation, agriculture and irrigation. Increasing soil sediment loads are an important threat to water quality.
- Other main threats to water quality include pollution with sewerage in urban areas and with agro-chemicals in rural areas, and the proliferation of invasive plants. The country's lakes, rivers and wetlands and wetland ecosystem functions are all under threat.
- Changes in hydrological regime over the past 40 years have been from perennial to seasonal, mainly due to significant variations in weather patterns, ranging from severe droughts to extreme flood events with associated landslides and strong winds. This has also led to aridification in some areas of the country – mainly in the central and southern Shire Valley.
- There is high energy demand, with 93%, from fuel wood and charcoal. Forest cover has declined from ~ 47% in 1975, to ~26% in 2006 (4.4 to 1.9 million ha from 1972 to 1992), with 21% under Forest and Wildlife Reserves and National Parks, leaving only 7% on customary land. Deforestation continues at a rate of ~2.8% -3.4% per year. By 1992 it was estimated that the annual wood consumption of 5.2 Mm³ exceeded sustainable supply by 3.3 Mm³ and a fuelwood crisis is looming.

Malawi's biological diversity is highly varied with ~100 plants, reptiles, amphibians, and ~500 endemic fish species in Lake Malawi. There are 33 protected large mammals and 11 protected tree species, most of which are found in the five National Parks and four game reserves, covering 11.6% of the country's land area, or in the lakes, wetlands and rivers. Biological diversity is now seriously threatened, mainly due to habitat encroachment and decline, over-harvesting, and the introduction of alien species. About 60% of the country has been modified, leaving only 36% under natural vegetation.

Poaching, mainly using wire snares, has caused the decline of many of the large mammal species. Nyala, waterbuck and sable antelope populations have significantly declined in National Parks and reserves, and the elephant population is now reduced to vulnerable status. Game hunting is limited to a few small game species, but game bird hunting is permitted, and trapping is recognised as a major economic activity. Trapping continues in the nesting season though, so the activity is non-sustainable.

The fisheries sector is very important, with artisanal fisheries located mainly in rivers and inshore areas accounting for 85-95% of the annual catch of ~50,000 tons. Aquaculture and fish farming are not yet well developed. Fish provide 60-70% of the country's animal protein intake, but per capita supplies have steadily fallen (12.9 kg/yr in 1976 to 6.4 kg/yr in 2003) due to over-fishing. This has caused declining catches, a reduction in size and age of catch, altering the species composition and biodiversity of fish-stocks and decreasing protein supply. Fish species and aquatic biodiversity are also under serious threat due to siltation of spawning grounds, and the prevention of fish migration to breeding areas in rivers because of weirs and other obstructions.

NTFP are increasing sources of alternative or complementary income and a risk of over exploitation exists due lacking management. Fire mostly of human origin, is one of the greatest threats to forestry, with productivity regularly destroyed by bushfires.

The general living conditions, characterized by widespread poverty and decreasing trends in food and economic security create a dependence on short-term income generation instead of long-term, sustainable natural resource management. With so many people producing staple food crops on very small, manually cultivated, rainfed plots (<0.5ha/family), there is little opportunity for food and income security, and with shifting agriculture no longer possible, soil fertility and crop yields are rapidly declining. Meanwhile, livestock and range productivity are limited by the lack of availability of grazing land. Livestock numbers are low, so impacts from livestock are restricted to marginal areas such as hill sides, where they cause erosion, and to wetlands and riverine areas, affecting wetland function.

These problems have encouraged non-sustainable Income-generating strategies such as live tree-felling to make charcoal to sell, and cropping on riverbanks and in seasonally dry stream beds.

Irrigation development has quadrupled over the past 40 years and water-related vector-borne diseases prevail around irrigation schemes. Meanwhile, domestic water consumption is steadily rising, with surface water and groundwater quality still acceptable for human consumption but the major rivers showing increasing pollution.

Urban growth is increasing at a rate of ~6.7%, with the current urban population estimated at 1.4 million. Of this, 60-70% live in traditional housing areas and unplanned squatter settlements. Poor or disregarded planning has resulted in extreme urban squalor and deprivation, poor sanitation, and the rapid spread of communicable waterborne diseases. Improper disposal of wastes (liquid and solid), agro-chemicals (fertilisers and pesticides), and effluent from industries, hospitals and other institutions are major urban problems with only 77% of proper disposed waste and most of the waste water enters the river systems that provide drinking water for downstream communities as raw sewerage.

The environmental impact of mining and industries is still limited due to the minor economic role of the sectors, but extraction of construction materials e.g. sand and clay for bricks, lime for cement (with a high demand for fuelwood for brick-making), are increasing. Sand and gravel extraction leave large holes, providing environments for disease vectors and waterborne pathogens, and disrupting fish breeding grounds. Industries, mainly in agro-processing, compound the pressure on the urban waste management systems. Other mining and industry issues include cement-making, which is the second greatest contributor to GHGEs in Malawi, after agricultural-related causes, and creation of noise, dust, air pollution from furnaces, and effluent by-products, but these impacts are currently very low.

The importance of a national environmental information system (EIS) was clearly stated in the NEAP in 1996, but a regular systematic survey has never been implemented.

B. Environmental policy, legislative and institutional framework

Since 1996, a large number of sectoral and overall policies related to environment have been developed and implemented. There is a generally good environmental legislative framework including EIA, standards and norms, but there are aspects that need better harmonisation and some legislation still awaiting approval. Malawi is also a signatory to many International and Regional Treaties and Conventions concerning Environment and Natural Resources

The actual problem is that the policy and legislative framework are very complex and relevant documents are often only known about in the concerned department or ministry. There are few follow-ups and/or concrete actions aside from policy development and existing regulations for the different economic sectors are not always respected, which is mainly due to a lack of priority within Government, and a lack of funding, manpower, and equipment in the technical departments for control.

The institutional framework for environmental management is set through the Environmental Management Act (1996). The framework is divided into 4 administrative levels and the Environmental Affairs Department (EAD) is the central coordinating body. The current Institutional Framework is highly complex due to the number and size of the institutions involved in administering environmental affairs. This includes confusion about responsibilities and a general lack of awareness of cross-cutting environmental issues and how to include them into project design. In addition, the delivery of environmental management services is fragmented across NRM sector ministries dealing with environmental issues, resulting in a lack of coordination.

GoM accords an important position to civil society in the environment management system. District Assemblies are responsible for managing local development plans, ensuring the implementation of concrete environmental actions, and including EIA and environmental and natural resource utilisation programs by CBOs and NGOs, who, along with Scientific Research Institutions, are included in the policy development process at national level. But there is still a lack of understanding of roles and responsibilities in environmental management at the village level, often resulting in expectancy that the government has to manage and pay for everything.

Human capacity is generally constrained starting from Departmental level, right through to the District and village level. The technical capacity within the environmental management system is lacking, with key personnel not in place. At the District level, EDOs are either absent or their role is carried out by unqualified/untrained staff. Most of the GoM structures are operating with less than 50% of the necessary staff and key tasks especially implementation, monitoring, control and coordination are not assured. Lack of adequately trained people is a problem in some technical disciplines, especially in the 'brown environment' (waste water and solid waste management, air pollution control). Research institutions are not being proactive enough in adapting student courses to deal with new issues and social and technical needs.

District technical support and community programs have been assumed by NGOs and CBOs through donor funds due to missing capacities (human and finances) in the districts. Lack of management capacities exist at all levels including NGOs, and communities often get

inadequate or incomplete support resulting from programs that are often subsequently not sustained.

Funding of environmental activities is insufficient at all levels. The budgets requested by the different departments are never fully allocated, mainly resulting in reduced field activities such as control and supervision missions and surveys. Due to a low number of paying clients and increasing urban environmental problems, the maintenance and extension of basic services cannot be provided adequately in urban areas by the City Assemblies. Districts have neither equipment nor recurrent budgets to operate extension and maintenance operations. This results in rapid deterioration of infrastructure developments.

At the national level, information exchange and circulation are already very slow, but when added to the weaknesses in implementation capacity, effective, sustainable NRM, is further impeded.

C. EU and other donor co-operation with the Country from an environmental perspective

Most of the assistance is implemented through specific sector Programs of each donor corresponding to the GoM's priorities. SWAPs exist for the health and education sectors but for the environment-related sectors (mainly agriculture) they are not yet developed. After environment-specific programs in the period 1990 to 2000, environmental issues are now generally embedded as cross-cutting issues in sector programs.

The EU has been one of the most important donors in the sector for some time now (EDF 7, EDF 8). The ongoing EDF 9 focuses on agriculture/food security/natural resources, transport/ infrastructure and macro-economic support. Justice, governance, non-state actors, health and trade are also supported as non-focal sectors.

Several Programs have significant environment components mainly in sustainable agriculture, forestry and water/sanitation. They include: Support to Implementation of the Malawi Land Reform Program, 4th Micro-Projects Program (MPP4), Farm Income Diversification Program (FIDP), Improved Forest Management for Sustainable Livelihoods (IFMSL), Institutional Development across the Agro-Food Sector (IDAF), Sustainable Nutrition Rehabilitation Program (SNRP), Multi-Annual Food Security Program (MAFSP), 2002 Emergency Food Aid, Income-Generating Public Works Program (IGPWP).

Environmental aspects are included in the preparation phase of new projects, and regular monitoring (mid-term reviews, reporting ...) are specific to project objectives with the risk that secondary environmental effects may not be fully appreciated. Environmental impact

monitoring should be done by the concerned districts, but their capacities are usually too weak or completely lacking. Recently, no EIA has been done because the EU's 'road maintenance programs' don't include new road constructions and the programs have been completely implemented since long time. SEA and/or environmental audits have never been done.

Other donors are funding a large number of programs and projects with an environmental focus and/or anticipated impacts (WB, ADB, USAID, JICA, CIDA, Norway, UNDP, WFP, FAO, IFAD, and UNICEF) (Annex 7.2.9).

A Donor Coordination Committee is operational in the agriculture/food security sector (DCAFS) but it focuses on agriculture production while environmental issues are rarely targeted as a priority. Coordination has improved, but fragmented and/or non-harmonised actions and approaches still limit the benefits. A specific Donor Committee on environment no longer operates due to the actual approach by GoM to environment as a cross cutting issue in sector programs. The lack of coordination has resulted in fragmented environmental actions and lack of a holistic view.

The general impact of donor activities on environment is still limited, with the main problem being non-sustainability of the outputs. The creation of parallel structures by donor-funded projects concentrates the best human capacity into well-paid project jobs, resulting in the loss of capacity in the Government and local administration. Donor interventions have contributed to better environment awareness, and a more or less complete legal framework and action plans, but the implementation of sustainable NRM is still at early stage. In general, the direct support to combat environmental problems has decreased with the conversion of environment and natural resource management programs into a cross-cutting issue. This is because little effort has been made to address the country's environmental-poverty nexus through the realisation of environmental management and planning.

7. Technical Appendices

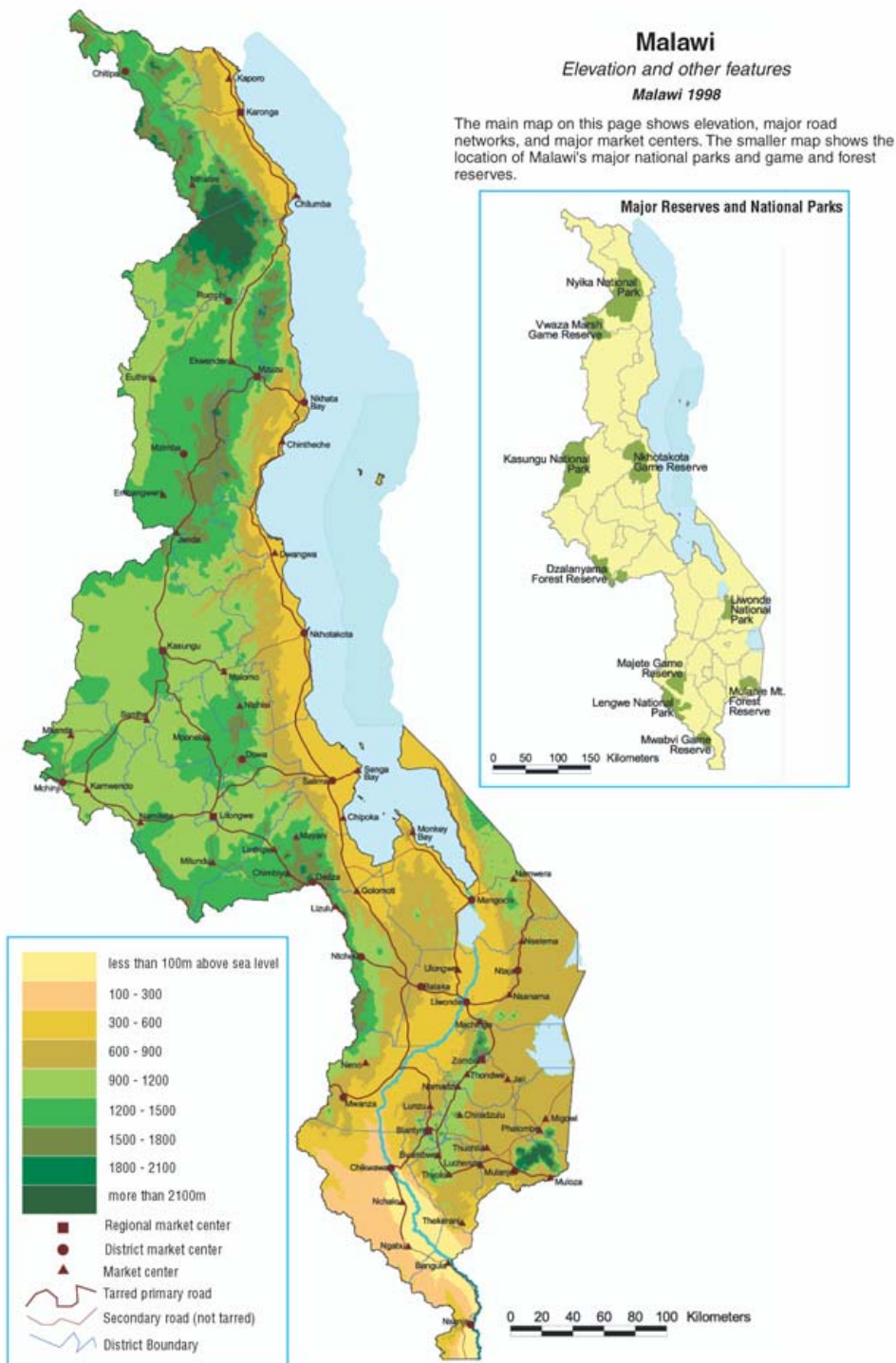
7.1 Environmental maps of the Country

Map 1 Administrative Districts



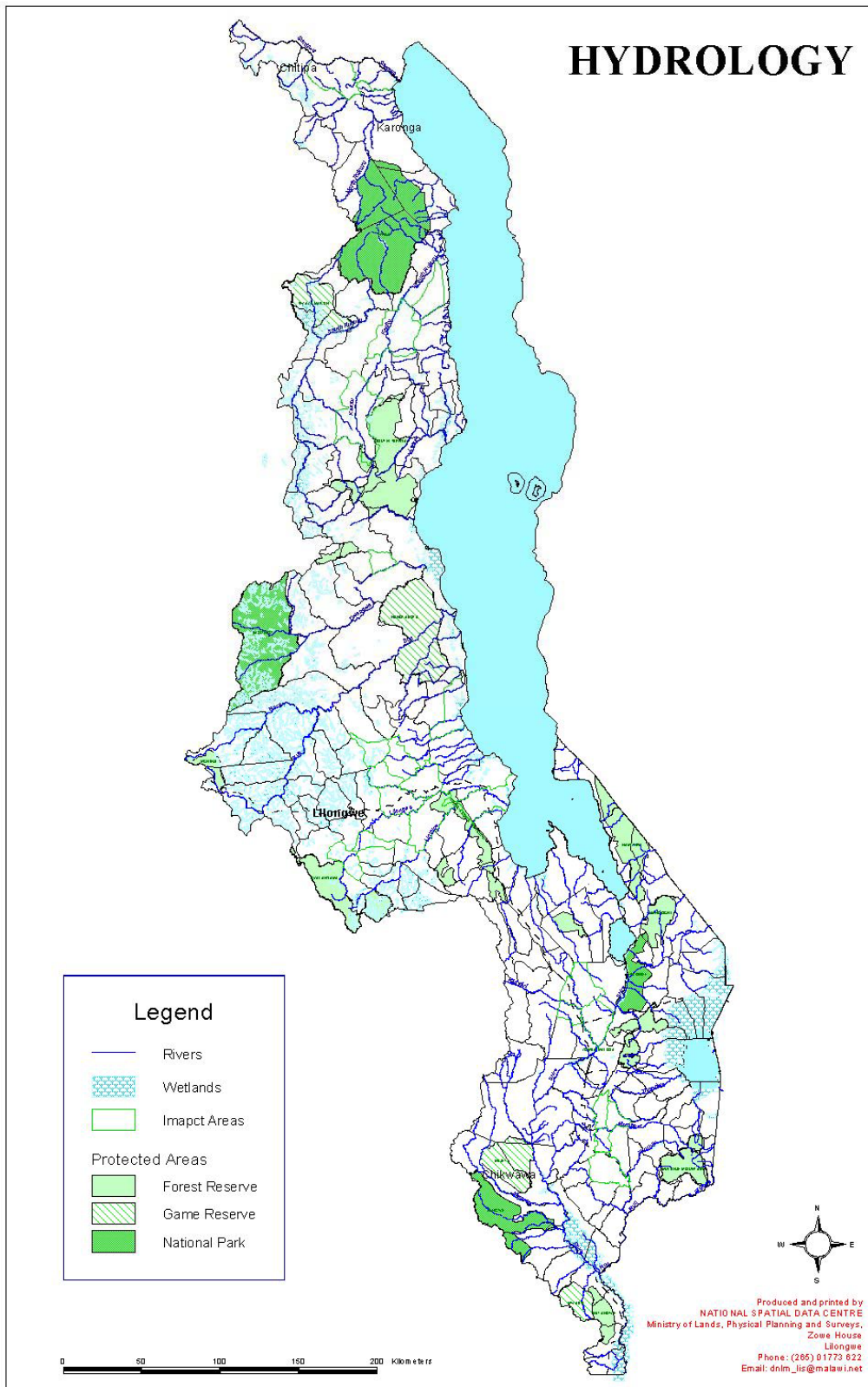
Source: National Atlas

Map 2 Elevation and major national parks and game and forest reserves

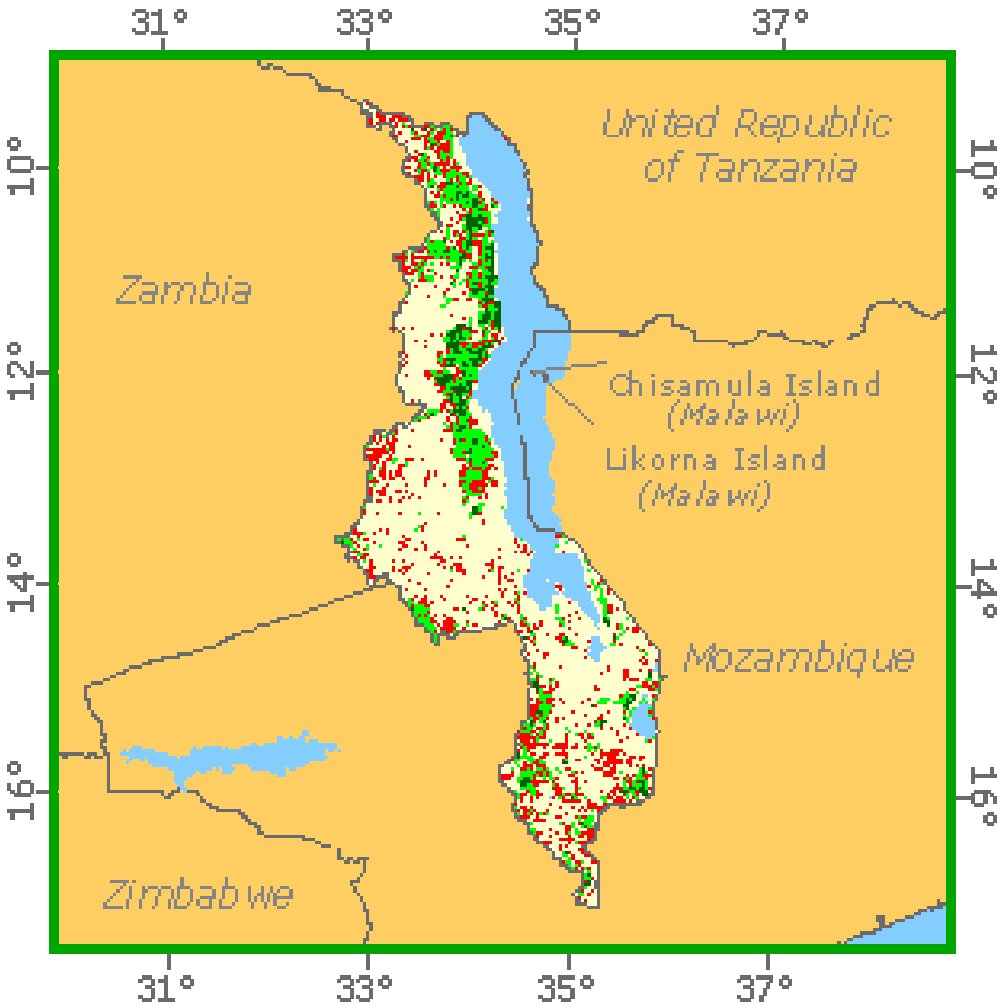


Source: National Atlas

Map 3 Hydrology



Map 4 Forest Cover

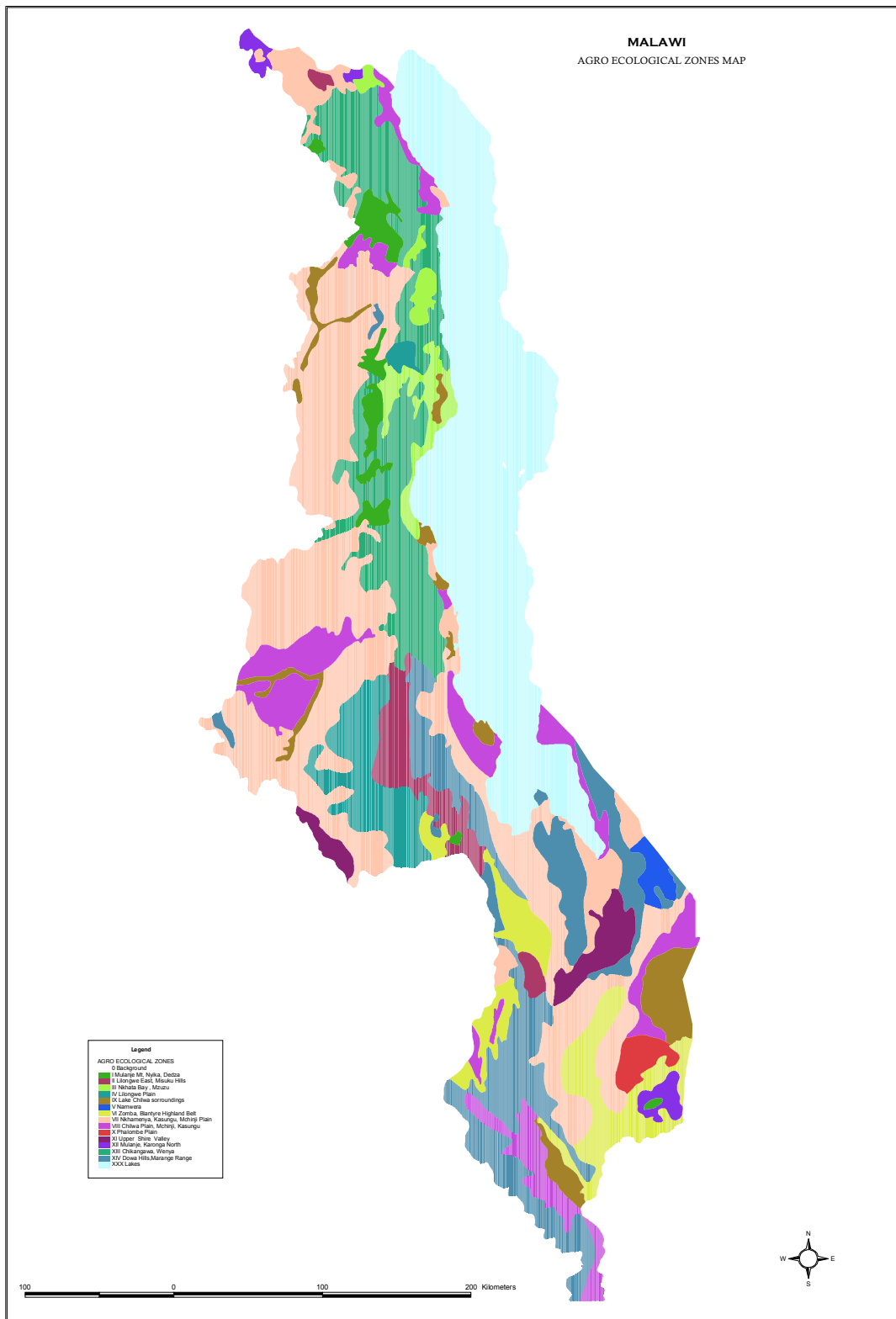


Legend

	Water
	Closed Forest
	Open/Fragmented Forest
	Other Wooded Lands
	Other land cover

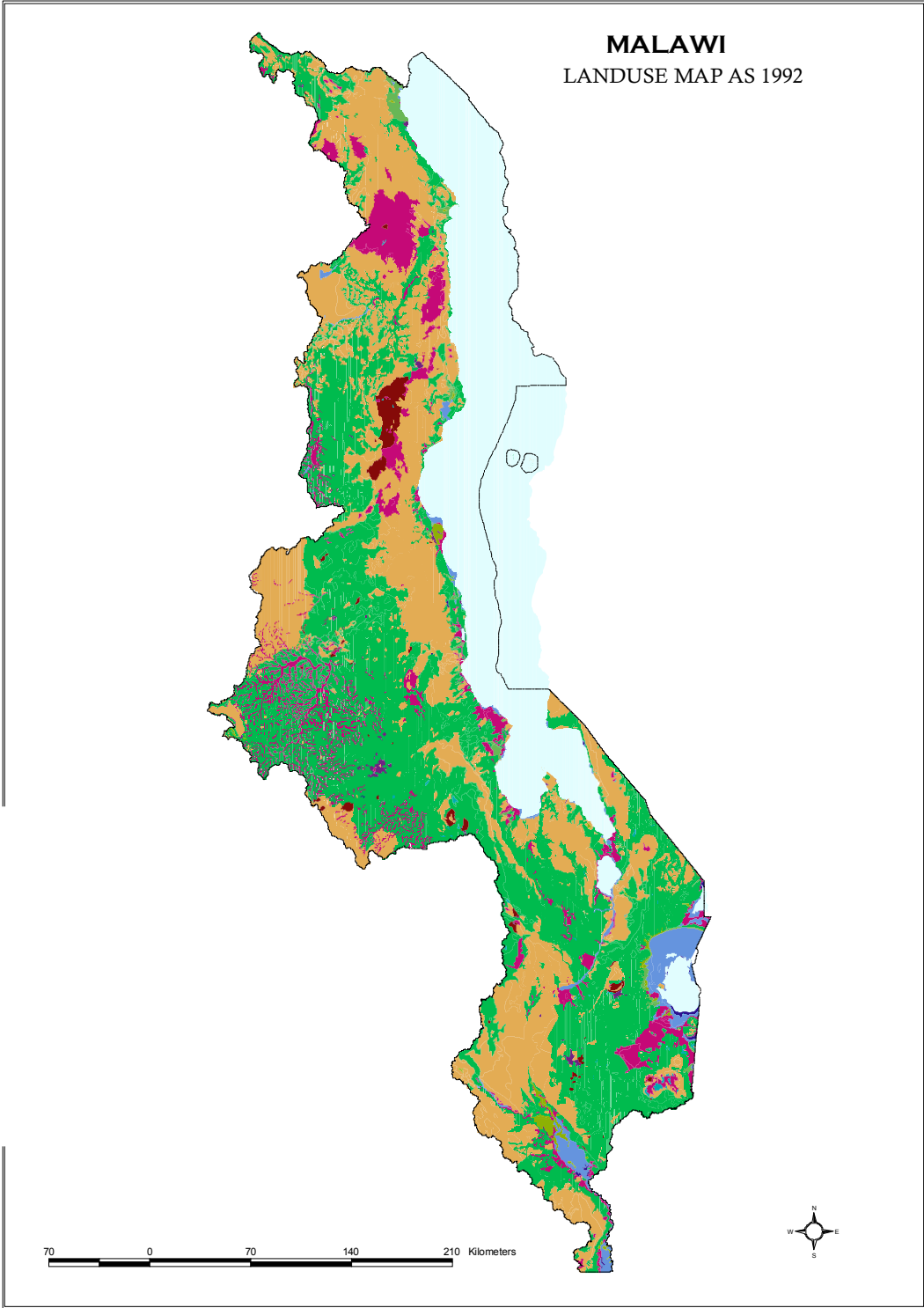
Source: FAO.org, country profiles

Map 5 Agro-Ecological Zones



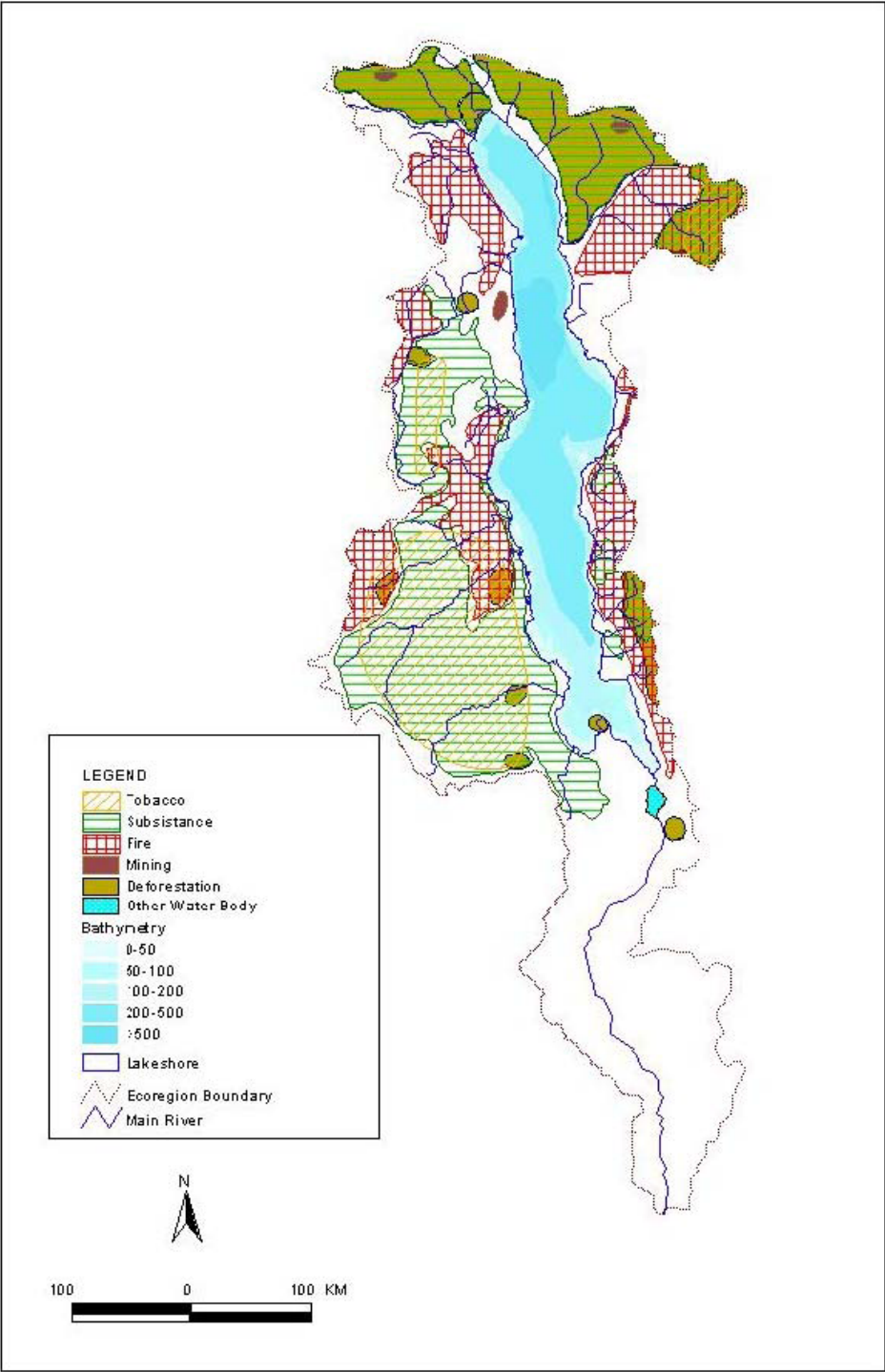
Source: Department of Land Resources Conservation

Map 6 Land use



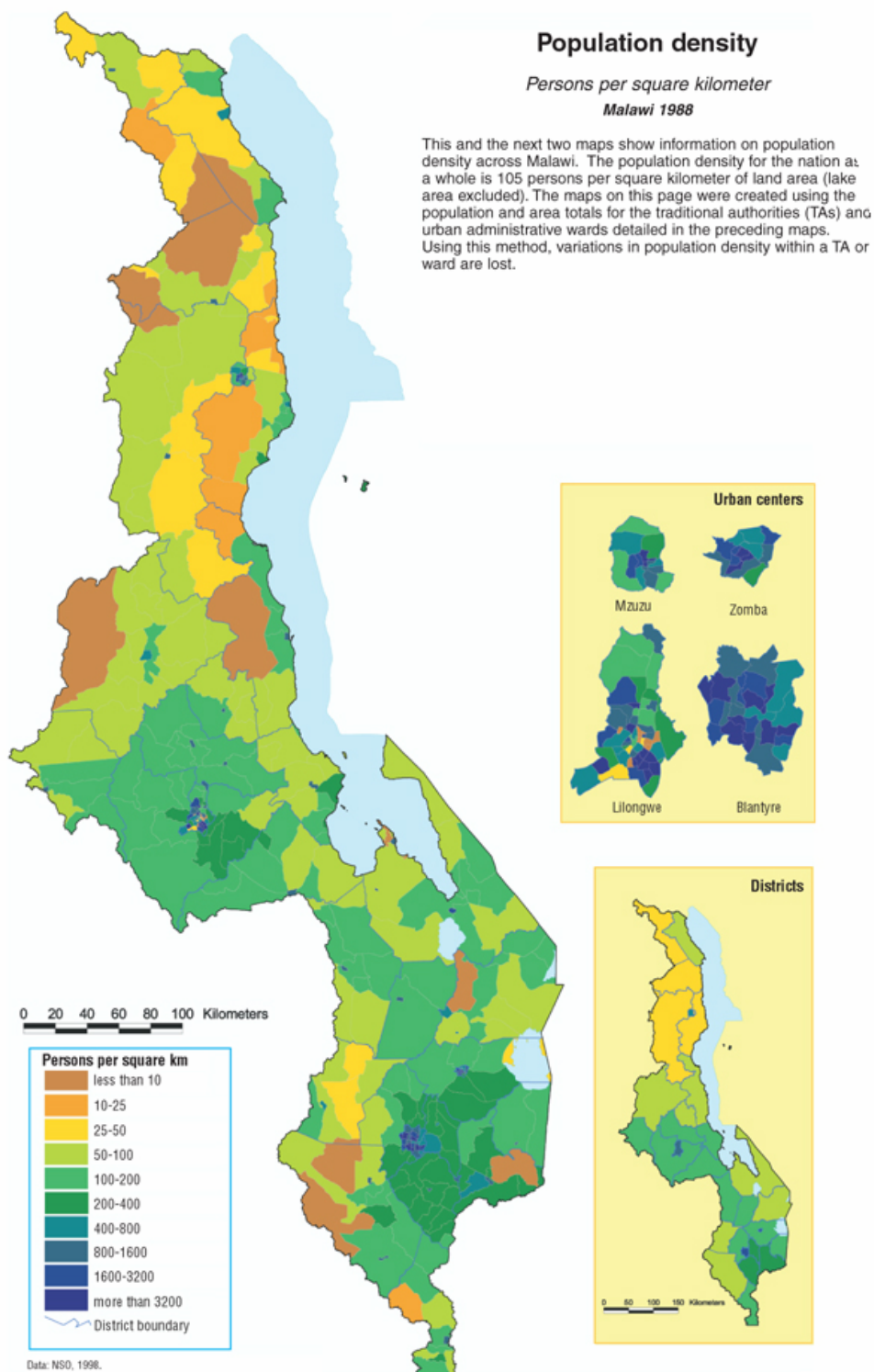
Source: Department of Land Resources Conservation

Map 7 Distribution and types of threats from land based human activities on the catchment areas of Lake Malawi / Nyasa / Niassa Ecoregion



Source: WWF 2005

Map 8 Population density



7.2 Reference list of environmental policy documents, statements and action plans, and other relevant technical information.

Annex 7.2. 1: Reference list of environmental policy documents, statements and action plans

	Policies/Laws	Year of Enactment
A	Overall policies	
1	Vision 2020: The National Long Term Development Perspective for Malawi	2000
2	Malawi Economic Growth Strategy (MEGS)	2003
3	Malawi National Strategy for Sustainable Development (NSSD)	2004
4	Malawi Development Growth Strategy (MDGS)	January 2006
B	Environmental Management	No. 23, 1996
5	Environmental Management Act	August, 1996
6	The National Environmental Policy	February, 1996
7	Guidelines for Environmental Impact Assessment	December, 1997
8	National Environment Action Plan	1996 (Rev.) June 2004
C	Decentralization and Natural Resources Management	
9	The Local Government Act	December, 1998
10	The National Decentralisation Policy	October, 1998
11	A Strategy for Capacity Development for Decentralization in Malawi: Phase 1 – Capacity Assessment	2006
D	Land Use and Management	
12	The Land Act	1965
13	The Customary Land (Development) Act	1967
14	The Registered Land Act	1967
15	The Town and Country Planning Act	1988
16	National Physical Development Plan: Vol. I & II	1887
17	National Land Resources Management Policy and Strategy	1998, (rev) 2000
18	National Land Use Planning and Management Policy	(Project Proposal), 2005
19	National Land Policy	January, 2002
E	Water and Irrigation	
20	The Water Resources Act	1969
21	The Water Works Act	1995
22	The Irrigation Act	1998 (Rev.) 2001
23	The Water Resources Act (draft)	May, 1999
24	Water Resources Management Policy and Strategies	1994
25	Water Resources Management Policy and Strategies (draft)	May, 1999
26	National Irrigation Policy and Development Strategy	Draft 1998, 2000
27	Malawi National Water Policy	2004
F	Forestry	
28	The Forestry Act	No. 11, May, 1997
29	The National Forest Policy of Malawi	January, 1996
G	Energy	
30	National Energy Policy	January 2003
31	Energy Regulation Act	No. 20, 2004

32	Rural Electrification Act	No 11.2004
33	Electricity Act	No. 21, 2004
H	Fisheries	
34	The Fisheries Conservation and Management Act	No 25, 1997
35	Fisheries Regulations	1997
36	National Fisheries and Aquaculture Policy	1999, (rev) 2001
37	Department of Fisheries Strategic Plan 2002-2007	2003
38	National Aquaculture Strategic Plan 2006-2015	2005
I	National Parks and Wildlife	
39	The National Parks and Wildlife Act	1992
40	The National Parks and Wildlife (Amendment) Act draft	1999
41	The National Wildlife Policy	June, 1998
42	Wildlife Policy	October, 2000
J	Population	
43	National Population Policy	1994
K	Waste Management and Sanitation	No principle statute
44	Sanitation Policy	In Press, August, 2006
L	Air and Noise pollution	No principle statute
M	Toxic substances and chemicals	
45	Pesticides Act	No. 2, 2000
46	Liquid Fuels & Gas (Production and Supply) Act	No. 23, 2004
N	Transboundary Water Resources	No principle statute
O	Agriculture	
47	Crop Production Policy	1984
48	National Seed Policy	1993, (rev) 2003
49	Seed Act	No. 9, 1996
50	A New Agricultural Policy: A Strategic Agenda for Addressing Economic Development and Food Security in Malawi	2005
51	Pesticides Act	2000
52	Tobacco Act	1970
53	Fertilizer, Farm Feeds and Remedies Act	2003
54	Cooperative Societies Act	2002
55	Policy Document on Livestock in Malawi	2004
56	Strategic Plan to Improve Livestock Production 2003-2008	2003
P	Biological Resources	
57	Biosafety Act	No. 13, 2002
58	Procedures for Assessment & Collection of Genetic Resources in Malawi	2002
Q	Disaster Management	
59	Food & Nutrition Security Policy	June, 2005
60	National Disaster Management Plan for Malawi	2004
R	Science & Technology	
61	Science & Technology Act	No. 16, 2003
62	Malawi Agricultural and Natural Resources Research Master Plan	1995

Annex 7.2. 2: Status of International Conventions

Convention/Protocol	signed	ratified	Current Status
International Protection of Birds (1950)	?		
International Plant Protection (1951)	1974		
High Seas (1958)	1965		
Living Resources of the High Seas (1958)	1966		
Banning Nuclear Weapon Testing (1963)	1965		
African Nature Conservation (1968)	1973		
Ramsar Convention (1971) Wetlands of international Importance	1971		Wetlands Association formed chaired by National Parks. 2000 SOER and 2001 Management Plan prepared. 2001 Bird Catchers Association formed 2001 Lake Chilwa Wetland Management Plan
Protection of World Cultural and National Heritage Sites (1972)	1975	1982	Nankumba Peninsula declared National Park assisted by UNESCO World Bank Project to develop community based trusts.
Trade in Endangered Species CITES (1973)	1975	1984	Incorporated into law by act of parliament
Hostile Use of Environmental Modification (1976)	1978	1978	
Conservation of Migratory Species of Wild Animals (1983)	1983		
UN Convention on Law of the Sea (1982)	1984	1984	
Action Plan for Zambezi River (1987)	1996		SADC Shared watercourses treaty
Montreal Protocol on Ozone Layer (Ozone depleting substances, 1987)	1987		Methyl Bromide strategy to phase out by 2017
FAO International Convention on Plant and Genetic Resources			
Convention on Biological Diversity (1992)	1992	1992	Incorporated into law by act of parliament Bio-diversity strategy & action plan prepared 2001 GEF Lake Malawi project implemented to conserve fish. GEF Mt. Mulanje Conservation Trust established. Chapter in SOER and DEAP prepared.
Convention to Combat Desertification (1994)	1994	1996	National strategy and action plan prepared supported by UNSO.
UN Framework for Climate Change (1992)	1994	1996	Inventory of green house gases underway.
Basel Convention (Transboundary movement of hazardous wastes)			
Persistent Organic Pesticides (POPs)	To be signed	To be ratified	Project for Assessment of POPs under preparation

			Identifying areas requiring regulations.
Prior Informed Consent (PICs)			
Rotterdam Convention		To be ratified	
Bio-safety Protocol	To be signed	To be ratified	National bio-safety framework under preparation. Bio-safety bill under preparation. Lack bio-safety technology and need scientific support.
Kyoto Protocol	1992	1994	
SADC Treaty on public information, education and participation on environmental development	1992		
Johannesburg, UNC-WEHAB	2002		Water, Energy, Health, Agriculture & Biodiversity - for sustainable natural resources for improved livelihoods and poverty eradication

Annex 7.2. 3: Major ecological zones in Malawi, with their sizes, descriptions and locations

Ecological zone ¹	Estimated area (ha)	Description of main features: plant, animal, fish species etc. and rainfall	Location
Central Zambesian Miombo Woodland	4,739,360	Open canopy woodland of plateaus, hills and scarps (<i>Brachystegia/Julbernadia/ Isoberlinia</i> sp. In Nkhotakota key mammals are elephants, buffalo and sable). Major soils are Ferralsols ² .	Northern to central eastern Malawi, along the Lake Malawi escarpment, covering Chitipa, parts of Karonga, Mzimba, Nkhotakota, Dowa, Ntchisi, East Lilongwe and Dedza Districts
Southern Rift Montane Forest	592,420	Montane forests. Areas of high rainfall ³ (> 1400mm/yr)	In Nyika National Park and the Vipya areas
Southern Miombo Woodland	355,450	Open canopy woodland of fertile areas (<i>Piliostigma/ Acacia/Combretum</i> sp.). Soils are mostly luvisols and ferralsols, rainfall range of 800-1,000 mm/yr	Central-west of the country, i.e. south west of Lilongwe to Mchinji
Eastern Miombo Woodland	236,960	Open canopy woodland of fertile areas (<i>Piliostigma/Acacia/Combretum</i> sp.). Soils are mostly ferralsols. Mammals are mainly elephants moving between Liwonde National Park and Mangochi Forest Reserve. Rainfall range is 800-1,000 mm/yr	North of Lake Chilwa and just south of the eastern arm of Lake Malawi, i.e. Namwera area
Zambesian and Mopane Woodland	1,184,840	Mopane woodland and woodlands on fertile soils (<i>Adansonia/Acacia/Cordyla</i> sp.). Key mammals are elephants, waterbuck, hippos, sable in Liwonde National Park and fish in southern Lake Malawi, the Shire River and Lake Malombe	South of Lake Malawi, covering the Upper Shire River region from Mangochi and Balaka Districts and west of Machinga (Liwonde area) and a small portion west of the Elephant Marsh, i.e. Lengwe National Park area
Zambesian Flooded Grassland	236,970	Swamp grasslands, perennially wet. This is an important habitat for waterfowl.	Mostly Lake Chilwa and its surroundings and some surroundings of Lake Malawi
Sth Malawi Montane Forest-Grassland Mosaic	947,870	Montane evergreen forests, montane grasslands in high altitude areas. Areas of high rainfall	Zomba, Blantyre, Mulanje and Thyolo areas
Water	3,554,520	Water in lakes. There is diverse fish fauna in Lake Malawi and its catchment. Rainfall is varied, >1,400mm from northern and central areas to the range of 1,000-1,200mm in southern areas	Lake Malawi

¹ Based on WWF eco-regions map for Southern Africa (1999) in Cumming (1999)

² Based on soil map of southern Africa Region from FAO (1977) in Cumming (1999)

³ Based on map of mean annual rainfall in southern Africa (WWF-SARPO) derived from rainfall data from Hutchinson *et al.* 1996 in Cumming (1999).

Source: EAD, 2002

Annex 7.2. 4: Status of major mammal species (EAD, 2002)

Estimated trends and status of major mammal species in Malawi

Species	Trend	Status
Buffalo	Stable	Satisfactory
Bush buck	Figures not reliable	Probably satisfactory
Common duiker	Figures not reliable	Probably satisfactory
Eland	Stable	Satisfactory
Elephant	Decreasing	Vulnerable
Impala	Increasing	Satisfactory
Hartebeest	Decreasing	Vulnerable
Kudu	Figures not reliable	Unsatisfactory
Puku	Increasing	Vulnerable
Reed buck	Decreasing	Rare
Nyala	Decreasing	Satisfactory
Roan antelope	Decreasing	Rare
Sable antelope	Increasing	Vulnerable
Warthog	Increasing	Satisfactory
Zebra	Decreasing	Vulnerable
Water buck	Increasing	Satisfactory

Populations of some species of animals that are now extinct/facing extinction in the protected areas

Species	Status	Location	Threats
Black rhino	Critically endangered	Only found in Liwonde National Park. Extinct in Kasungu National Park and Mwabvi Wildlife Reserve	Recently reintroduced, the number is still very small, i.e. not viable. Cross border poaching with illegal fire arms mostly from the civil war in Mozambique caused original extinction
Cheetah	Critically endangered	Kasungu National Park. Probably extinct in Nyika National Park	Numbers may not be viable
Elephant	Extinct	Majete Wildlife Reserve	Poaching by Mozambican refugees with illegal firearms
Lion	Extinct in 1997/98, but a few individuals returned in 2001	Liwonde National Park	Small non-viable population threatened by wire snares
Lion	Critically endangered	Kasungu National Park, Vwaza Marsh and Nkhotakota Wildlife Reserves	Populations may not be viable and could become extinct
Puku	Critically endangered	Kasungu National Park	Poaching is a threat
Wild dog	Occasionally seen, numbers not estimated, critically endangered	Kasungu and Nyika National Parks	Their numbers may not be viable; may be killed by snares in the bush

Annex 7.2. 5: National Parks and Wildlife Reserves in Malawi

National Parks:	Area (ha)	Wildlife Reserves:	Area (ha)
1. Nyika	313,400	1. Nkhotakota	180,200
2. Kasungu	231,600	2. Vwaza	98,600
3. Lengwe	88,700	3. Majete	69,100
4. Liwonde	33,800	4. Mwabvi	13,500
5. Lake Malawi	9,400		
Total Area (ha): 1,037,600			

Source: Department of Parks and Wildlife (EAD 1998)

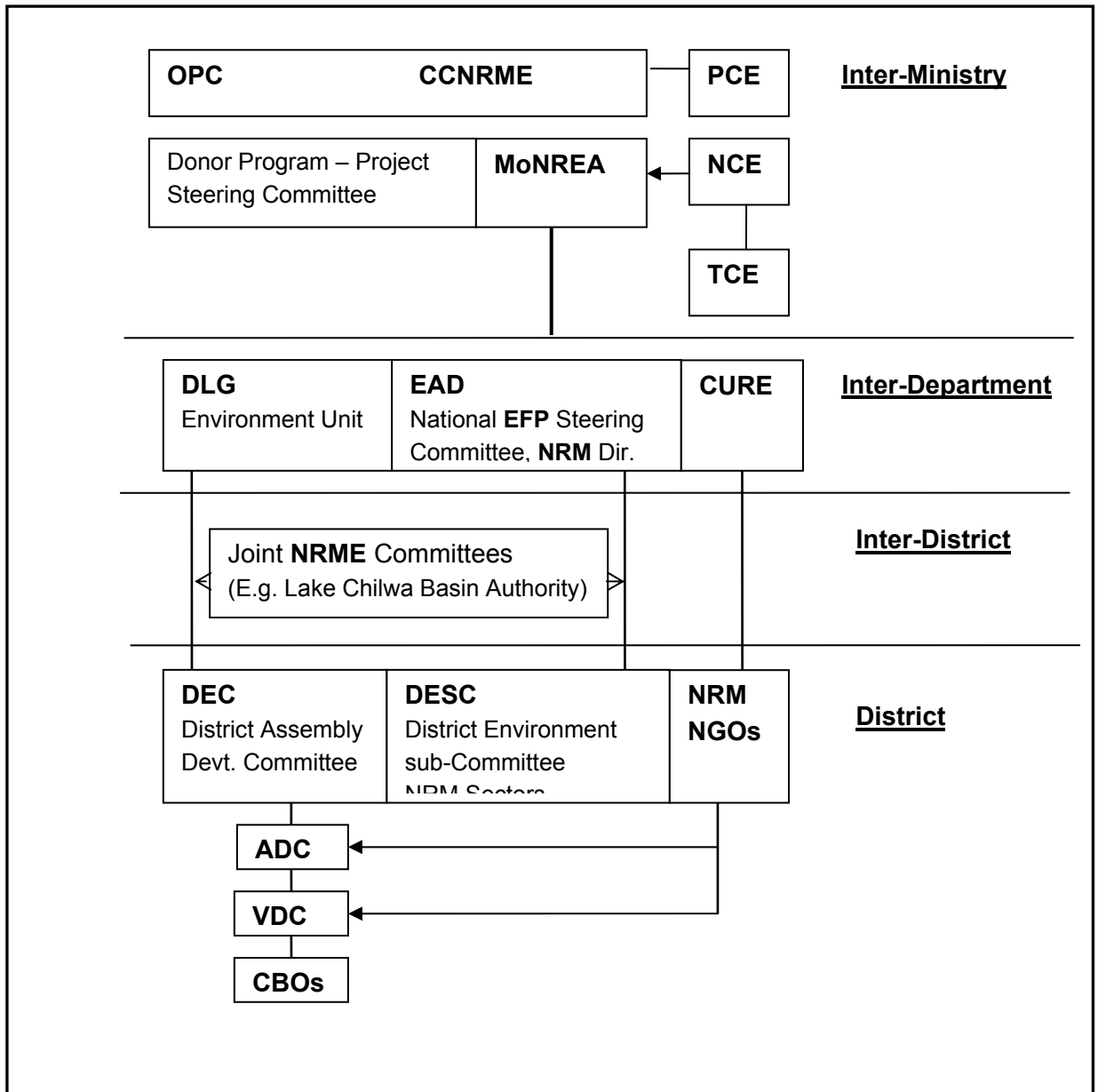
Annex 7.2. 6: Summarized Table of natural disasters in Malawi from 1967 to 2006

	No. of Events	Killed	Injured	Homeless	Affected	Total Affected	Damage US (000's)
Drought	7	500	0	0	25,829,435	25,829,435	0
Earthquake	1	9	100	50,000	0	50,100	28,000
Epidemic*	11	1,479	0	0	46,040	46,040	0
Famine	2	0	0	0	2,307,267	2,307,267	0
Flood	20	574	0	304,800	1,390,090	1,694,890	24,789
Wind Storm	1	11	8	0	0	8	0

*Epidemics include: Meningitis, Diarrhoeal/Enteric, Plague, Diarrhoeal/Enteric(Cholera), Diarrhoeal/Enteric(Acute watery diarrhoeal syndrome)

Source: "EM-DAT: The OFDA/CRED International Disaster Database, www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium", Created on: Jul-23-2006. - Data version: v06.05

Annex 7.2. 7: Institutional Framework Diagram



Annex 7.2. 8: Provisional Financial Donor Matrix (2002-2006)¹ in million euros

Donor/Sector	Rural Development	Health	Food Security	Budget Support	Education	Good Governance	Transport	Economic Management	Judicial	Water	Trade Development	Energy/Environment	Decentralisation	Gender	Urban Development	Total
European Union	89.4	10.8	90.4	67.5	-	36.3	67.5	11.4	1.5	-	1.6	-	-	-	0.1	376.4
DFID	50.0	82.6	38.6	67.1	21.8	25.3	-	15.5	16.8	-	-	-	-	-	-	317.7
USAID	32.6	52.5	127.0 ²	-	78.7	4.1	-	-	0.4	-	-	-	-	-	-	295.3
World Bank	105.8 ³	41.7	4.8	66.7	30.2	-	- ⁴	20.3	-	-	12.5	0.3	-	-	0.5	282.8 ⁵
AfDB	46.5	25.1	-	11.7	50.3	20.1	22.9	-	-	16.1	-	-	-	-	-	192.6 ⁶
NORAD	7.4	62.9	20.5	15.9	-	4.0	-	6.4	-	2.3	-	-	-	-	-	119.4
IMF	-	-	-	46.6	-	-	-	-	-	-	-	-	-	-	-	46.6 ⁷
Germany	2.3	4.9	-	-	7.0	2.9	0.3	1.4	-	-	-	4.9	4	1.3	-	29.0
France	-	-	2.8	-	0.3	-	-	-	-	-	-	-	-	-	-	3.1
Total	334.0	280.5	281.3	275.5	187.9	92.7	90.7⁸	55.1	18.7	18.3	14.1	5.2	4	1.3	0.6	1,660

Source: JAR 2005

¹ Global commitments (approximate) made during the 2002-2006 period

² USAID's Food Security Support includes US\$149 million (approx. €124 million) for the purchase and distribution of 300,000 tonnes of maize through the WFP in the 2002-2006 period.

³ World Bank Support to Rural Development includes US\$60 million (approx. €50 million) for MASAF III, of which, US\$27.2 million is a grant and US\$32.8 million is a concessional loan.

⁴ World Bank & Nordic Development Fund (NDF) support to the transport sector is a loan of \$37 million (approx. €30 million, ROMARP Programme, 1999-2006) committed in 1999 (not shown in the matrix).

⁵ World Bank total support consists of approximately €105.4 million in form of concessional loans and €177.4 million in form of grants.

⁶ African Development Bank support comprises approximately €113.9 million concessional loans and €78.7 million grants.

⁷ IMF support is the US\$55 million (2005-2008) PRGF Programme.

⁸ Not included is the BADEA/OPEC/KUWAIT Fund US\$40 million (approx. €33 million) loan for construction of the Naminga-Chiponde-Mangochi Road Project which started in 2001.

Annex 7.2. 9: Donor funded environment or environment related projects in Malawi

European Union

Project Abbr.	Project	Partner	Duration	Costs (€)
FIDP	Farm Income Diversification Project	MOA	2005 - 2011	16,2 Million
IDAF	Institutional Development Across Agro Food project	MOA	2005 - 2011	7.970.000
	Support to the implementation of Malawi Land Reform	MLHS	2004 - 2009	1.969.065
IFMSL	Improved Management for Sustainable Livelihood	DoF	2005 - 2011	9 Million
MAFSP	Multi Annual Food Security Program	GOM, NGO	1999 - 2009	53 Million
FSP	Food Security Program for Malawi 2004-06	GoM	2005 - 2012	45 Million
IGPWP	Income Generating Public Works Program	M. Loc. Gov.	2005 - 2011	15.512.500
MPP	Micro Project Program	GoM, CBO, NGO	2003 - 2008	35 Million
NICE	National Initiative for Civic and Voters Education	Min. Finance	2000 - 2006	8,8 Million
MAGIC	Malawi Geographic Information Council (Land Reform Process)	MLHS		

Norway (1\$ = 5, 83 NOK)

Project Abbr	Project	Other donors	Partner	Duration	Costs (NOK)
	Bunda College of Agriculture			ongoing	4 Million
NASFAM	Addendum 1 to NASFAM Strategic Development Program			ongoing	10 Million
	Decentralisation Support	OXFAM		2004 - 2007	2 Millions
	SADC Biodiversity Support			ongoing	3,5 Million
	Irrigation and Water Development	FAO		In preparation	4 Million

UNDP/GEF/UNEP

Project Abbr	Project	Partner	Duration	Costs
	National Capacity self- Assessment for Global Environmental Management	EAD	2003 -2005 (completed)	197,200 \$
	Persistent Organic Pollutants Enabling activities for the Republic of Malawi	EAD	2003 - 2005 (ongoing)	496,500 \$
	Methyl Bromide Phase Out Project in Malawi	EAD	2001 - 2005 (extended)	2,999,824 \$
	Institutional Strengthening for the implementation of the Montreal Protocol *	EAD	1994 - 2010	346,383 \$ (1994-2005)
NAPA	National Adaptation Program of Action	EAD	2003-2005 (ongoing)	200,000 \$

	Partnership for the Development of Environmental Law and Institutions in Africa *	EAD	ongoing	270,000 \$
	Southern Africa Biodiversity Support Program		2000 – 2005 (just completed)	270,000 \$
	Development of a National Housing Policy and Legal Framework	MLHS		
	National Renewable Energy Strategy.		Closing 2006	
BARREM	Barrier Removal to Renewable Energy in Malawi	DoEA	2002 - 2007	3,353,000 \$
	Second Communication to the UBFCC		2005 - ongoing	420,000 \$
	Sustainable land management and adaptation to climate change in the Shire River Basin		proposal	

USAID

Project Abbr.	Project	Partner	Duration	Costs (\$)
COMPASS II	Enhance household revenue from CBNRM		2004 - 2009	14.553.249
	Community based Management of Chia Lagoon Watershed		2004 - 2007	2.074852
	Cassava and Sweet Potato Production	MOA, IITA	2003 - 2006	957.350
	Marketing and production of groundnuts, rice chillies, paprika and soybeans	NASFAM	2003 - 2006	6.300.000
	Dairy sector		1999 - 2006	9.300.679
LIF	Improving Livelihoods through increasing food security	Catholic Relief Services	2005 - 2009	2.978.044
Nature	Implementation of the revised National Environmental Policy	EAD	2004 – 2005 finished	9 Million

FAO

Project	Other donors	Duration	Costs (\$)
Enhancing Food Security and Developing Sustainable Rural Livelihoods	NORAD	2006 - 2011	5.290.000
Enhancing Food Security in Cassava based farming systems (Malawi and Zambia)	Italian Trust Fund	2006 - 2008	1.500.000
Support to Small-scale Fish Farming Enterprises		2006 -	314.000
EC/FAO Program on Food Security: Pre-testing of FAO Food Security Monitoring Tools	EU	2006 -	125.000
Promoting & Improving Food & Nutrition Security of Orphans & HIV/AIDS affected Children (Phase 1: Lesotho/Malawi)		2003 - 2006	1.500.000
Women, Girls, HIV and AIDS in relation to access to property for sustainable income			87.000
Support of the Formulation of a National Capacity Building Program for Food Security			100.000
National Forest Program Facility		2006 - 2007	

Promotion of Crop diversification in Response to the Current Food Crisis	LUX	2005 - 2007	242.455
Enhancing Livelihoods and Food and Nutrition Security in Vulnerable SADC countries	RSA	2006 - 2007	1.959.769
Promotion of small scale irrigation and crop diversification in Machinga, Kasungu, Lilongwe districts of Malawi	Spain	2006	296.500
Supporting bee-keeping project for Takondwa women group		2003 -ongoing	5.834
Pig Breeding and fattening for Lumbadzi Women Group		ongoing	5.474
Enhancing sustainable food and nutrition security through agricultural development	JPN		2.500.000
Food and Nutrition Security Policy Formulation and Analysis Capacity Building Project		2006 - 2007	160.125
Masambankhunda Fish Farming Project		Submitted for consideration	7.700
Chongoni Potato Producers Project		Submitted for consideration	4.065
Egg Production Project for Sisters of the Holy Rosary Egg Production, Rumphu, Malawi		Submitted for consideration	4.000
Vegetable Production Project in Salima		Submitted for consideration	7.400

IFAD

Project	Other donors	Duration	Costs (\$)
Rural Livelihood Development		Since 2001	16.56 million
Smallholder Flood Plains Development Projects	Irish Trust Fund	Since 1998	15.47 million
Irrigation, Rural Livelihoods and Agricultural Development Project		Approved 2005	52.08 million

World Bank

Project Abbr.	Project	Partner	Duration	Costs (\$)
	Community Based Rural Land Development Project	MLHS		27 million
	Irrigation, Rural Livelihood and Agriculture Productivity Project		- 11/2011	27,600,000
MASAF III	Third Social Action Fund			
ISP	Infrastructure Services Project		Preparation	40 Million
	National Water Development Project II		Proposed	
APL 2	Southern African Power Pool project		Proposed	
	Mulanje Mountain Biodiversity Conservation Project			5.45 Million

ADB

Project Abbr.	Project	Partner	Duration	Costs (\$)
	Customary Land Reform and sustainable Rural Livelihood Project	MLHS	Preparation 2007-2011	23,304 M
	Rural Income Enhancement Project	MOA	Until end 2006	12,571,000
SHIP	Smallholder Irrigation Project	MOA	Until 7/2007	8,320, 000
	Smallholder Outgrower Sugarcane Production Project	MOA	Until 7/2007	12,336,000
	Macadamia Smallholder Development Project	MOA	Until end 2006	10,673,000
	Horticulture and Food Crops Development Project	MOA	Until end 2006	12,571,000
	Lilongwe Rural forestry Project	Dep. Forestry		420,780
	Lake Malawi Artisanal Fisheries Development Project	Dep. Fisheries	2003 - 2008	900,921
	Mwanza Rural Development Project			1,457,219

Japan (JICA)

Project Abbr.	Project	Partner	Duration	Costs
	Capacity Building and Development for Smallholder Irrigation Schemes	MOA	2006 - 2009	
	Lobi Horticultural Appropriate Technology Extension Project	MOA	1998 -2006	
	Master Plan Study on Aquaculture Development In Malawi	MoMNR E	2003 - 2005	
	Aquaculture Research and Technical Development of Malawian Indigenous Species	MoMNR E	1996 - 2006	
	Follow up Study for the Master Plan o Rural Electrification			
	Groundwater Development for Kalolo and Khongoni	MoW	2007 -2010	372 million MK
OVOP	One Village One Product Program (Economic Empowerment of Communities through the utilisation of locally available resources	Min Local Gov.	2003 - 2010	

Other Donors

Donor	Project	Partner	Duration	Costs (€)
Iceland	National Land Use and Management Policy	MLHS	planned	
BADEA	Small Farms Irrigation Project			
UNCHR	Neno Boma Water Supply System			
Finland	Support to Malawi Forestry College Curriculum Revision	Forestry Dept.	2003 – 2005 finished	535,560
Canada	Community Water, Sanitation and Health Project			

8. Administrative Appendices

8.1 Study methodology/work plan

Activity	Organisation and outcomes	Work days	Place
Field phase in Malawi			
International travel		1	Residence - Lilongwe
Briefing in Malawi with the EC Officers	<ul style="list-style-type: none"> Analysis of the specific issues to be addressed during the briefing ; Discussions on the mission ToR and preparation of the mission ; Identification of the key actors and major stakeholders to meet and/or to contact ; 	1	Lilongwe
Literature review and Desk Analysis	<ul style="list-style-type: none"> Collect, review of environmental literature, evaluation reports, environmental policy and legislation framework, legislation and regulations and enforcement relating to environmental issues produced by Government and/or development partners, action plans, and progress in implementation ; Review of environmental performance indicators selecting appropriate indicators; 	3	Lilongwe
Meetings with key actors	<ul style="list-style-type: none"> Meetings and consultations with other key actors and major stakeholders (WB, Malawi research institutions, line ministries, other development partners, NGOs, the private sector and civil society) Assessment of the environment sector of Malawi and identification and prioritisation of needs. This will be done through : Assessment of the environment identifying key environmental factors influencing Malawi's development and the responses to these ; Assessment of national environmental policy and legislation; institutional structures and capacity, and the involvement of civil society in environmental issues ; Analysis of past and ongoing international cooperation in the environmental conservation and management field ; Assessment of past and anticipated future trends of environmental indicators ; 	9	Lilongwe
Field visits	Field visits to sites of key environmental concern: a judicious itinerary of visits will be made and agreed during the meeting with the EC Officers that will ensure that the needs of the mission are met effectively and efficiently. The field visits will also allow the team to collect data from the field;	4	Out of Lilongwe
Work on the Draft Report / Debriefing Note	<p>Presentation of the initial findings of the Team, in the form of a Draft Report, at a workshop to be held in Malawi. The key environmental concerns and follow-up actions are identified and, as far as possible, a consensus is obtained on these;</p> <p>On the reporting side, we propose to submit the Draft Profile few days after the field mission (and not in Malawi) in order to let the experts integrate the comments received during the workshop and the debriefing in Malawi. More, this would also allow the experts in AGRIFOR's HQs to monitor the content of the Report before submitting it. If the Contracting Authorities agree on that reporting timing, the presentation of the initial findings of the Team would be done in the form of a <i>Debriefing Note</i>, introduced at the workshop.</p>	3	Lilongwe

Debriefing with the EC Officers in Malawi	The team will present its findings to the EC Officers in Malawi, enabling them to discuss and clarify some aspects if deemed necessary.	1	Lilongwe
Workshop	Organisation of a workshop in Malawi to which national authorities, international donors, experts and civil society representatives will be invited with the aim of identifying and attempting to obtain a consensus on key environmental concerns and follow-up actions. The team will present its initial findings. This workshop will also provide the different stakeholders in Malawi with an opportunity to clarify any issues identified by or proposals suggested by the team. This approach will enhance the participatory planning process. This workshop will be convened incorporating the advice of the EC Delegation on matters such as subject matter, format, attendance, protocol and timing. We suggest that this workshop be held towards the end of the mission in order to discuss and verify the findings of the mission.	1	Lilongwe
Finalisation of Draft Report	All the relevant data are collected and analysed, enabling the team to prepare the Draft Report, taking into consideration the results of the workshops and of the meetings.	1	Lilongwe
International travel		1	Lilongwe - Residence
Final Report			
	<i>Submission of the final Draft Report by AGRIFOR</i>	---	
Final Report	Integration of the comments received from the several authorities and stakeholders on the Draft Report <i>Expected result: Submission of the Final Report</i>	1 (*)	Residence of the expert

* : Only Team Leader

8.2 Consultants' Itinerary

DATE (7/8 2006)	ACTIVITY
Mon 24/7	Travel to Malawi (*)
Tues 25/7	Travel to Malawi
Wed 26/7	Briefing EC Delegation (9:00) Meeting EC section Infrastructure (16:00)
Thur 27/7	Contact Department of Environmental Affaires (8:15) Meeting NGOs (12:00) Participation on workshop 10.EDF (14:00)
Fri 28/7	NAO, establishment of meeting Program (8:00) Meeting Ministry of Agriculture, Department of Land Resources (10:00) Meeting World Bank (14:00)
Sat 29/7	Review relevant literature, evaluation reports, environmental policy and legislation
Sun 30/7	framework, legislation and regulations and enforcement relating to environmental issues, action plans, and progress in implementation
Mon 31/7	Meeting WESM (Wildlife and Environment Society of Malawi) (9:30) Meeting FAO (11:00) Meeting Environmental Affaires Department (14:00) Meeting DFID (16:00)
Tues 1/8	Meeting Ministry of Agriculture (8:30) Meeting Ministry of Water, Irrigation and Development (10:00) Meeting NICE (14:00) Meeting of Lands, Physical Planning and Surveys (15:30)
Wed 2/8	Meeting JICA (8:45) Meeting NORCONSULT (ISP Infrastructure Services Program WB) (11:30) Meeting Ministry of Forestry (14:30)
Thur 3/8	Field visit Dzalanyama Forest Reserve: Environment training, CBO (WESM) and Sinyala (cooperative forest management), Katete Plantation (Dep. of Forestry)
Fri 4/8	Meeting Lilongwe City Assembly (8:30) EC meeting (10:00) Meeting Royal Norwegian Embassy (13:00)
Sat 5/8	Review relevant literature, evaluation reports, environmental policy and legislation
Sun 6/8	framework, legislation and regulations and enforcement relating to environmental issues, action plans, and progress in implementation
Mon 7/8	Meeting Department of National Parks and Wildlife (8:30) Meeting UNDP (GEF) (14:00) Meeting UN-Habitat (15:00) Meeting USAID (16:30)
Tues 8/8	Meeting Department of Energy (8:30) Analysis of initial findings Internet research for missing information
Wed 9/8	Meeting Ministry of Local Government (8:30) Consultation and discussion EAD (10.00) Meeting Department of fisheries (14:00)
Thur 10/8	Analysis of initial findings and work on the Draft Report

	Meeting Biologists Serving the World (NGO) (19:00)
Fri 11/8	Field visit Kantchentche fisheries project (JICA) and Salima Irrigation Scheme (EU)
Sat 12/8	Assessment of the environmental information (literature, meetings, policies) and
Sun 13/8	identification of key environmental factors influencing Malawi's development
Mon 14/8	Analysis of environmental and development indicators
Tues 15/8	Meeting NAO, preparation Workshop (14:30) Redistribution documents
Wed 16/8	Consultation EAD (9:00)
Thur 17/8	Meeting Department of Land Resources (9:00)
Fri 18/8	Work on the Draft Report / Debriefing Note Meeting Malawi Environmental Endowment Trust (MEET) (14:30)
Sat 19/8	Work on the Draft Report / Debriefing Note
Sun 20/8	Workshop preparation
Mon 21/8	Meeting NASFAM (8:00) Debriefing EU (11:30)
Tues 22/8	Workshop preparation (Presentation and handout)
Wed 23/8	Workshop, presentation of major findings and discussion with key stakeholders (8:30)
Thur 24/8	Finalisation of Draft Report
Fri 25/8	Finalisation of Draft Report
Sat 26/8	Finalisation of Draft Report
Sun 27/8	Finalisation of Draft Report
Mon 28/8	Travel back to country of residence
Tues 29/8	Travel back to country of residence

8.3 List of persons/organisations consulted

NAME	ORGANISATION	FUNCTION	CONTACT DETAILS
LETO, Raniero	EC Delegation	Head of Section Rural Development & Food Security	Tel: 01773199 e-mail: raniero.letto@cec.eu.int
INGELBRECHT, Chris	EC Delegation	First Counsellor (Infrastructure)	Tel: 01773199 e-mail: christopher.ingelbrecht@cec.eu.int
CHIRAMBO, Simon	EC Delegation	Project Manager Infrastructure	Tel: 01773199 or 08874007 e-mail: mcaubrey.chirambo@cec.eu.int
UOTILA, Marika	EC Delegation	Program Manager Rural Development & Food Security	Tel: 01773199 or 09965252 e-mail: marika.uotila@cec.eu.int
LONGWE, Misheck	NAO support unit	Desk Officer Economics & Good Governance Sector	Tel: 01788171/2/3 or 08537180 e-mail: mlongwe@naosupportmw.org
OJESI, Samson	NAO support unit		Tel: 08340930 e-mail: samojesi@naosupportmn.org
LUMANGA, Charles	NAO support unit		Tel: 08340938 e-mail: clumanga@naosupportmw.org
SIMBANI, Peter	NAO support unit	Deputy NAO	Tel: 01788130 or 08339860 e-mail: pksimbani@naosupportmw.org
NANTHAMBWE, Stephen	MOA, Land Resources Conservation Department	Deputy Director, Land Surveys and Evaluation	Tel: 01755048 or 09276538 e-mail: landcons@malawi.net or sjnanthambwe@yahoo.co.uk
TCHALE, Hardwick	World Bank	Agricultural Economist	Tel: 01770611 or 09450721 e-mail: htchale@worldbank.org
KAITANU, Vincent	WESM	Executive Board Lilongwe	Tel: 01771269 e-mail: wesm-u@africa-online.net
JUSOH, Mazlan	FAO	Representative	Tel: 01773255 or 08822853 e-mail: FAO-MW@fao.org
NKHOMA, Alick	FAO	Assistant FAO Representative	Tel: 01773255 or 08202248 e-mail:FAO-MW@fao.org
MWANYONGO, Mpetu	EAD	Assistant Director, Policy and Planning	Tel: 01771111
SANCHEZ, Bernabé	DFID	Economist	Tel: 01772400 or 08846110 e-mail: b-sanchez@dfid.gov.uk
BÖHRINGER, Dr.	GTZ	Country Director	Tel: 01794893
ZAMALIRANA, G.	Ministry of Agriculture	Principal Secretary	Tel: 01789033
KAZOMBO, J.	Ministry of Water, Irrigation and Development	Principal Secretary	Tel: 01770238 or 08385152 e-mail: jfkazombp@yahoo.com
KABONDO, Jeff	NICE	Deputy Project Manager	Tel: 01759275 or 08843230 e-mail: jkabondo@nicemw.org
KALIMBA, Dalitso	Ministry of Lands, Physical Planning and Surveys	Principal Economist	Tel: 01774766
KADOWAKI, Satoshi	JICA	Assistant Resident Representative	Tel: 01771644 e-mail: jicamw@jica.go.jp
MANDA, Reinford	JICA	Program Officer	Tel: 01771554 e-mail: jica@jica.go.jp

NAME	ORGANISATION	FUNCTION	CONTACT DETAILS
SIMWELA,	Department of Forestry	Director	Tel: 01771000 or 08394199
SCOTT, Jason	NORCONSULT	Economic and feasibility study (ISP World Bank)	Tel: 09164467
MVULA, Theresa	Department of Forestry		Tel: 08578286
YONANA, Mtsitsi	Department of Forestry	District Forest Officer Sinyala	
MULULA, Vitto	Lilongwe City Assembly	Deputy Director of Health and Social Welfare Services	Tel: 01773144 or 09239817 e-mail: vmulula@yahoo.com
PONDELANI, Godwin	Lilongwe City Assembly	Assistant Director of Parks, Recreation and Environmental Affairs	Tel: 01773144
SAUVIK, Leif	Royal Norwegian Embassy	Deputy Head of Mission	Tel: 01774211 or 08835748 e-mail: leif.sauvik@mfa.no
CHIKUNI, Augustine	Royal Norwegian Embassy	Program Officer	Tel: 01774211 or 08202915 e-mail: augustine.chikuni@norad.no
SEFU, Leonard	Department of National Parks and Wildlife	Director	Tel: 01759831 or 08868557 e-mail: dnpw@malawi.net
VISOCKY, Marc	USAID	Chief Agriculture and Natural Resources	Tel: 01772455 or 09960020 e-mail: mvisocky@usaid.gov
CHOME, John	UNDP/UN Habitat	Program Manager Malawi	Tel: 07701330 or 08846349 e-mail: john.chome@undo.org
M'MANGISA, Etta	UNDP/GEF	Program Officer	Tel: 01773500 or 01773637 e-mail: etta.mmangisa@undp.org
MHANGO, Lewis	Department of Energy	Director	Tel: 01770688
BULIRANI, Alexander	Department of Fisheries	Deputy Director	Tel: 01788716 or 08325282 e-mail: bulirani@sdpn.org.mw
LIGOMEKA, Stewart	Ministry of Local Government	Director	Tel: 01789192 or 09951807
NGONGONDA, Yamikani	OVOP (JICA)	Program Officer	Tel: 01770698 or 09222283 e-mail: yamikmn@yahoo.co.uk
SIMFUKWE, Simon	Salima Irrigation Scheme	Project Management Unit	
NTEWA, Evans	EAD	Deputy Director, Policy and Planning	
YASSIN, Ben	EAD	Regulation and Information	
CASTELLANO, Alexandre	Biologists Serving the World (NGO)	Country Director	Tel: 09964607 e-mail: alexandre.castellano@hotmail.com
KABWASA, R.	EAD	Director	Tel: 01771111 or 09276538
CHIBWANA, Tikhala	MEET	Chief Executive	Tel: 01620303 or 08821373 e-mail: tikhala@africa-online.net
WARREN, Duncan	NASFAM		Tel: 01772866

8.4 List of documentation consulted

Year	AUTHOR	TITLE
2006	MEDP	Annual economic report 2006
2006	African water facility, ADBG	Country water information and knowledge profile for Malawi (draft)
2006	EU, GoM	Joint Annual Report 2005
2006	JICA	2005 Malawi report
2006	World Bank	Project appraisal document for infrastructure service project (ISP)
2006	UNDP	Mid term review report: Barrier removal to renewable energy in Malawi
2006	UN - Habitat	Situation analysis on informal settlement in Blantyre City
2006	FAO	Aquastat – FAO information systems of water and agriculture
2006	FAO	County brief Malawi
2006	NORAGRIC	Decentralisation in the agricultural sector in Malawi
2006	IMF	Malawi: Poverty reduction strategy paper. Annual progress report
2006	ADB	Customary land reform and sustainable rural livelihood project. Volume 1: project preparation report
2005	UNDP	Malawi human development report 2005. Reversing HIV/AIDS in Malawi
2005	NORAGRIC	Opportunities for Norwegian support to agricultural development in Malawi
2005	NEPAD/FAO	Support to NEPAD-CAADP implementation. Volume 1 National medium term investment Program (NMTIP)
2005	EU, GoM	Joint Annual Report 2004
2005	UNDP	Technical review of the environment sector
2005	EAD	Summary state of environment report for Malawi 2004
2005	GoM	Development projects in Malawi: Progress assessment
2005	WWF	Priority conservation areas and vision for biodiversity conservation Lake Malawi
2005	FAO/WFP	Special report: FAO/WFP crop and food assessment mission to Malawi
2005	ESMAP	Malawi: Rural energy and institutional development
2004	EAD	Malawi national strategy for sustainable development
2004	EAD	State of environment report 2004 (draft)
2003	EU, GoM	Joint Annual Report 2003
2003	ADB	Malawi Country Strategy Paper 2002 – 2004
2003	EAD	National greenhouse gas inventories for Malawi
2002	EAD	State of environment report
2002	NORAD	Study on private sector development in Malawi
2001	EU	Country Strategy Paper and National Indicative Program Malawi 2001 - 2007
2001	EAD	Strategy for the decentralisation of environmental management
2001	FAO	Country forestry profile
2000	NSO	Integrated household survey 1997 – 98
2000	SADC/GEF	Fish ecology report. Lake Malawi/Nyasa/Niassa biodiversity conservation project.
2000	EU/FAO	Non wood forest products in Malawi
1999	Bootsma, Hecky	Water quality report. Lake Malawi/Nyasa/Niassa biodiversity conservation project.
1998	EAD	State of environment report

8.5 *Curricula vitae* of the consultants

CURRICULUM VITAE – International Expert Category I – Team Leader – Birgit Halle

Born: 30th December 1963 in Unna (Germany), German, single

Education (1983 -1989):

Study of Geography at the University of Cologne (Germany), title 'Master of Geography'

Further trainings:

Conflict – management, Organisational development in technical cooperation, Local dynamic and development planning: local planning and NRM, System management: network thinking and strategic acting in development co-operation, Planning of national - and sector programs, Methods of project – and program planning ZOPP and PRA, Impact – monitoring in technical cooperation

Key qualifications:

Natural resource management, desertification, tropical forest, ecology, rural development, land use planning, feasibility and evaluation studies, participatory approaches, gender, civil society integration, organisational development, training programs

Professional experience record:

Since 4/2002 : Independent consultant and trainer:

- Short term missions:

- 2006, Malawi, for European Commission: Country Environmental Profile of Malawi, Team Leader.
- 2006, Côte d'Ivoire, for European Commission: Country Environmental Profile of Côte d'Ivoire, Team Leader.
- 2006, Mali, for European Commission: Country Environmental Profile of Mali, Team Leader.
- 2005, Guinea, for European Commission: Final evaluation program AGIR, regional program of integrated management of natural resources.
- 2004 for European Commission in Brussels : Member of the external evaluator group: Evaluation of EC environment proposals (call for proposals Reference EuropeAid/117490/C/G/Multi)
- 2004, RD Congo : Household survey (for IFESH/CARE/IRC): Demobilisation and Community- based Reintegration of Former Child Soldiers in Eastern DR Congo, Team Leader
- 2003, Cameroon, for European Commission: Mid-term evaluation of the Project: Protection and rehabilitation of forests in the Noun Department.
- Trainer: Preparation course for overseas experts, country knowledge of Cameroon (INWENT/DSE, Germany)

1/1996 - 3/2002: Long term overseas Expert for GTZ (German Technical Cooperation) in following countries:

- 7/1999 – 3/2002 (Cameroon): Project: Protection of natural forests in S-E Cameroon. Responsible for self – help activities, negotiation and communication with the local population, minority problems
- 6/1997 – 6/1999 (Rep. Central Africa): Project: Development of basic – organisations in Ouham – Pende. Responsible for the development of basic self – help organisations.
- 1/1996 – 5/1997 (Zaire/DRC): Project: Rural development Kabare, Zaire. Responsible for self – help, development of basic – organisations, women promotion, gender, alphabetisation and energy saving stoves

Internal short term missions during GTZ contract:

- 2000, RCA: Follow up strategy of the project 'Development of basic – organisations in Ouham – Pende'
- 1999, Cameroon: Internal evaluation of the social-economic activities of the project 'Protection of natural forests in South – East Cameroon'
- 1998, Rwanda: Delimitation of the modified Akagera National Park (secondary marks)
- 1998, Bukavu (DRC): Evaluation of the project activities since 10/96 and elaboration of propositions for the continuation of the project 'rural development Kabare'
- 1997, Congo Brazzaville: Elaboration of the conception to integrate the local population in the buffer zone management in North Congo (project: Protection of ecosystems, PROECO)
- 1997, Zaire (DRC): Feasibility study of the project 'Co-operation with NGOs in Zaire'
- 1996, Zaire (DRC): Mid term review : Project 'Promotion of coffee production, Mahagi'

10/1991 - 4/1994 (Mali): Volunteer DED (German Volunteer Service)

Project Leader: PAE (Projet Agro-Ecologie) in Kita: combating erosion/desertification, energy saving stoves, land use planning, agro-forestry

3/1989 – 9/1991 and 5/1994 – 12/1995: Independent Consultant and Trainer:

- Trainer: Preparation courses for overseas experts, country knowledge for Namibia and Mali (monthly) (DSE, Germany)
- Environment Impact Assessments (waste water treatment stations and other construction projects), Germany
- Scientific assistant consulting GEOPLAN: contribution to studies on ACP countries

Other regional experiences: Namibia: scientific research on geo-ecology/desertification and actualisation of country documentation for DSE (1986, 1987, 1988, 1995)

CURRICULUM VITAE – International Expert Category II – Environmentalist – Jeremy Burgess

Male

Date of birth: 12th September 1959, Zomba, Malawi

Married

Education and experience (1988 -1991): M.Sc. Agriculture (Range Ecology) University of Natal, South Africa,

1979-1983: B.Sc. Agriculture, Edinburgh

Professional Member of the South African Institute of Ecologists & Environmental Scientists (SAIEES)

Author/Co-author of numerous EIA Documents (> 140 in number)

Key qualifications:

Range and land systems ecology (mountains and water catchments, arid and semi-arid), community based natural resource management & eco-tourism developments, land rehabilitation, land use planning, agriculture incl.: irrigation, livestock & crop production, agricultural marketing, feasibility & evaluation studies, participatory approaches, gender, civil society integration

Recent Professional Experience:**Independent consultant on Environment, Agriculture, Eco-tourism and CBNRM (since 1989, & farming, 1983-1988)**

Short term projects:

- 2006, Malawi, for European Commission, Environmental Specialist: Country Environmental Profile for Malawi
- 2006, Malawi, for UNDP, Malawi, Project Profile Development, International Specialist: Shire River Sustainable Land Management and Climate Control in Middle Sire River, GEF PDF-B,
- 2006, Malawi, for World Bank, through Norconsult (Norway): Infrastructure Provision Services Feasibility Study. Specialist in Environment, Agro-processing and marketing
- 2006, Botswana, for Ecosurv/Merz & McLellan Engineers: Ecologist & Team Leader for Dukwi Mine Electricity Power Supply Line EIA
- 2006, The Gambia, for UNETEC, Dubai: EIA specialist Laminkoto – Passimus – Bassé – Koina Road Upgrading Project, and Environmental Manager on Bakoteh Dump Site (nr Banjul) Decommissioning.
- 2006, Eritrea, for UNETEC, Dubai: EIA specialist the Massawa – Assab Road Upgrading Project
- 2006, Botswana for Ecosurv/Bergstan Engineers: Agricultural and waste water specialist: utilisation of waste water for agricultural purposes for Molepolole Sewerage Upgrading Works
- 2005-2006, Zambia, for Norconsult (Norway): Team Leader/Environmental Specialist for Lusaka Water & Sanitation – EIA for emergency works on Lusaka water and sanitation rehabilitation Phase I, World Bank funding program.
- 2005-2006, UN-FAO. International Consultant, Ecologist and Agro-biodiversity Specialist for Kagera River Basin Transboundary Agro-ecological Management Program. Final GEF Funding Document.
- 2005-6, for Natural Resources & People (Botswana): Range and Agriculture Specialist for Kedia and Boravast Indigenous Vegetation Project, drawing up management plans for remote area Community Natural Resources Utilisation based on range management and livestock management.
- 2004-5, for LOCI Environmental/Merz & McLellan Engineers: Ecologist for Morupule – Thamaga Electricity Power Supply Line EIA (~360km)
- 2004, Mongolia, for Chemonics (USA): Environmental Expert for development of a zoological park at Gachuurt, near Ulaanbaatar.
- 2004, Botswana for private client, Ecologist-Eco-tourism expert: potential development assessment of lodge site in Chobe District
- 2004, Botswana, for Landflow-CCI & Kgalagadi District Council, Agriculture, Range Ecologist and NRM specialist: Kgalagadi District Communal Areas Management Plan
- 2004, Uganda, for BLZ (Zambia) & CEC (Jordan), Range Ecology expert: Range and general Environmental Assessment of water supply rehabilitation and extension in 6 districts in the cattle corridor in E and NE Uganda.
- 2004, Okavango Jakotsha Community Trust (OJCT) and private sector partner, project development specialist: Joint Venture Eco-tourism development and Management Plans for ~587 km² concession in N, Okavango Delta area.

Work Locations:

Botswana (resident), South Africa, Zambia, Malawi, Lesotho, Swaziland, Tanzania, Mali, The Gambia, Uganda, Rwanda, Eritrea, United Kingdom, Norway, New Zealand, Papua New Guinea, Trinidad & Tobago, Mongolia

Publications:

J Burgess, S Reynolds *et al.* 2003. FAO Range & Pastures Website on Botswana: National Profile, for FAO/UNDP, Rome. <<http://www.fao.org/ag/AGP/AGPC/doc/Counprof/Botswana/botswana.htm>>

Ecosurv and Rangelands & Ecological: Land Allocation Manual for Agricultural Purposes: Environmental Criteria. For Ministry of Agriculture, Gaborone, Botswana, funded by DANCED. August 2002

J Burgess, 1991: Monitoring the Impact of Basal Burning in the Natal Drakensberg: A Baseline Survey. For M.Sc. Thesis, Department of Agriculture, the University of Natal, Pietermaritzburg, South Africa

8.6 Terms of Reference for the Country Environmental Profile

LOT No: 6

Request No:

TERMS OF REFERENCE FOR THE PREPARATION OF THE COUNTRY ENVIRONMENTAL PROFILE OF MALAWI

1. BACKGROUND

Socio-economic situation

Malawi has a population of approximately 12 million people and is among the poorest countries

in the world. The country ranks 165th out of 177 in the UN's 2005 Human Development Index.

Poverty alleviation in Malawi has shown very little progress in the last 10 years. In 2005, about 6.3 million of Malawians (or 52.4% of the population) were estimated to be living below the Government calculated poverty line of approximately \$0.35 per day against a figure of 53.9% in 1998. In addition about 22 % of the population are considered to be ultra-poor, meaning that they cannot afford to meet the minimum standard for daily-recommended food intake. 85% of the population is classified as rural with large majority of households earn their livelihood from household farm or fishing activities. In fact only about 11 percent of household heads depend solely on a waged or salaried job. In short, poverty is both widespread and persistent. This has often led to the adoption of environmentally unsustainable coping strategies.

Geography of Malawi

Malawi is a land locked country of 118,480 km² of which 20% is occupied by Lake Malawi, which is 568 kilometres long and up to 16 kilometres wide. Its topography is highly varied. The land to the east and west of the lake forms high plateaus between 900 and 1,200 meters above sea level, while the Nyika highlands in the north rise to 2,600 meters. South of Lake Malawi the Zomba Plateau rises to 2,130 meters and the Mulanje Massif reaches 3,001 meters. By contrast, in the far south, Nsanje and Chikwawa districts are less than 100 meters above sea level. Malawi is endowed with high degree of biodiversity, especially in birds and freshwater fish. The climate is generally subtropical with local variations.

Environmental issues

Environmental degradation in Malawi continues to create serious social and economic hardship for many people. The main environmental problems include:

(1) Soil erosion

- (2) Deforestation
- (3) Overexploitation and contamination of water resources
- (4) Unsustainable use of fishery resources
- (5) Threats to biodiversity

Malawi is the most densely populated country in sub-Saharan Africa with an average land holding per household of 0.8 hectares. This land pressure has led to the opening up of marginal land for agricultural use. It is estimated that approximately a third of all agriculture is taking place on unsuitable land. This has resulted in deforestation, and soil erosion. It is estimated that for every inch of topsoil lost grain yields are reduced by 6%. Between 1972 and 1990 41% of Malawi forests were lost. Current deforestation continues at about 2.8% per year. While Malawi has over 4,000 species of animals, including the greatest freshwater biodiversity in the world with over 500 endemic species of fish, little has been done to protect or ensure the sustainable use of such resources. Although a number of studies have been undertaken on the lake Malawi fisheries there is little management and many stocks are seriously under threat.

This is of great concern as freshwater fish provide 70% of animal protein consumed in Malawi. Any decline in the freshwater stocks would have major dietary consequences. Malawi already suffers from high malnutrition rates. For example, lake trout or Mpsa (*Opsaridium microlepis*) from Lake Malawi is fished heavily during its spawning runs upriver but has suffered a 50% decline in the past ten years, due to siltation of its spawning grounds and reduced flows due to water abstraction. It is now listed as 'endangered' on the World Conservation Union (IUCN) red list.

Malawi's progress on the reaching the Millennium Development Goal 7 on ensuing environmental sustainability is mixed. Deforestation is continuing at an alarming rate, and the proportion of population using firewood for cooking remains very high (89.9%). However there have been improvements in the proportion of people who have access to potable drinking water (64%) and improved sanitation (62%).

EU cooperation experience on environment in Malawi

The 9th European Development Fund (EDF) Country Strategy Paper for Malawi 2002-7 has two focal areas; (a) infrastructure and (b) rural development and agriculture. A number of 9th EDF programmes in the rural development and agriculture sector seek to address some of the main environmental problems in Malawi, notably soil erosion and deforestation.

The Farm Income Diversification Programme (FIDP) builds on the former 7th EDF Promotion of Soil Conservation and Rural Production (PROSCARP), which in turn was a successor to both ADDFOOD and PAPPAs projects. The programme builds on the existing

soil conservation and water harvesting measures that PROSCARP initiated and compliments these activities by introducing diversification, strengthening farmer organisations and then assisting with the marketing of products. FIDP is a 6-year programme costing 36.5 M€, the first phase (3 years 16.2 M€) began in 2006.

The Improved Forestry Management for Sustainable Livelihoods seeks to address key issues of local-level governance of forest resources through promoting more effective and accountable institutions. By empowering the poorer sections of society in an equitable and transparent manner, it aims to ensure the sustainable use of the natural resources upon which they depend for their livelihoods. It is a 6-year programme costing 14.9 M€, the first phase (3 years, 9 M€) started in 2006.

The EU also supports a capacity building project in the Ministry of Lands. The project supports the implementation of Malawi's land reform programme. Security of land tenure is essential for the sustainable use of natural resources. Other programmes that have environmental aspects include the National Initiative for Civic Education (NICE), which has an environmental awareness component as one of its four main areas. In addition, the 4th Micro Projects Programme (MPP) and Income Generating Public Work Programmes (IGPWP) both have forestry and other environmental activities as part of their activities. Former EDFs have also support wildlife management in Malawi through regional programmes.

The European Commission supports a number of NGO projects, through both the food security budget line and the co-financing budget line, that address environment issues either directly or in part.

Policy context

The Government of Malawi's (GoM) Malawi Growth and Development Strategy (MGDS), the second generation PRSP, highlights five main themes; sustainable economic growth; social protection; social development; infrastructure; and good governance. The MGDS acknowledges that conservation of the natural resource base is important in order to achieve sustainable economic growth. More specifically, it recognises the importance of fisheries for both food security but also income generation. In forestry it highlights the need for improved productivity of the sector as well as the need for reforestation and improved management of forestry resources. Protecting biodiversity is perceived to be important in order to help increase tourism.

And lastly, sensitisation, environmental education and the enforcement of legislation are seen as

paramount in all areas. The National Environment Action Plan and the National Sustainable Development Strategy were developed in 2004 but little progress has been made on their implementation due to a lack of resources.

Timetable

The 10th EDF programming exercise is currently underway and will culminate with a draft Country Strategy Paper being finalised by the end of September 2006. The Country Environmental Profile (CEP) is expected to feed into this process. It is hope that the study can be undertaken in 5 weeks and that the finals report will be ready in mid August at the latest.

2. OBJECTIVE

The main objective of the Country Environmental Profile is to identify and assess environmental issues to be considered during the preparation of a Country Strategy Paper, which will directly or indirectly influence EC co-operation activities. The Country Environmental Profile will provide decision-makers in the partner country and in the European Commission with clear information on the key environmental challenges, the current policy, legislative and institutional framework and the strategies and programmes (including those of the EC and other donors) designed to address them. This information will ensure that the EC co-operation strategies systematically integrate environmental considerations into the selection of focal sectors and co-operation objectives/strategies, and also establish the necessary environment safeguards for all co-operation activities undertaken in the Country. The Profile will establish the key linkages between the environment and poverty reduction. It will constitute an important source of baseline information and contribute to focusing political dialogue and co-operation with the Country on key areas of concern including sustainable development as well as raising awareness among policy-makers.

3. RESULTS

The profile will deliver the following results:

- An assessment of the state of the environment and key environmental factors and trends influencing the Country's development and stability.
- An assessment of national environmental policy and legislation, institutional structures and capacity, and the involvement of civil society in environmental issues.
- An assessment of the integration of environmental concerns in development policy and sectors with key linkages with environmental issues.
- An overview of past and ongoing international (including EC) co-operation in the environment sector.

- Recommendations and, as far as possible, guidelines or criteria for mainstreaming environmental concerns in co-operation areas. These recommendations should support the preparation of the Country Strategy Paper/National Indicative Programme and include guidelines or criteria to be used for environmental mainstreaming in subsequent phases of the cycle of operations. Issues to be assessed:

The following issues should be assessed:

3.1. The state of the environment

This Chapter should identify the state and trends of key environmental resources or components in the country, including (as relevant), but not limited to:

Themes	Aspects
Mineral resources and geology	Mineral resources Geological risks (seismic, volcanic and related risks)
Land	Soil erosion and degradation Desertification Land use, arable land, losses due to urbanisation or infrastructure Building
Water	Water regime Ground water Water quality
Air and climate	Air quality Potential climate changes and vulnerability
Forest, vegetation, ecosystems	Forest cover and volume Pastureland State of particular ecosystems (savannahs, mangroves)
Biodiversity, wildlife	Local status of globally threatened species/habitats Alien invasive species Fish stocks Species with special value
Landscape	Aesthetic and cultural value of landscape
Living conditions in human settlements	Air and water quality Sanitation Slums Health Vulnerability to disasters

Pressures explaining the main negative trends should be identified, as well as pressures contributing to global environmental problems, using the following table as a guiding checklist.

Themes	Possible aspects to consider
Mining, extraction of hydrocarbons	Extraction, treatment and transport of minerals and hydrocarbons
Water use and management	Water extraction (surface- and ground-water) Waste water discharges Water use
Land management	Land use planning
Forest exploitation, hunting, fisheries, biodiversity	Forest extraction Forest and fisheries management practices Hunting and fishing activities, poaching Use of NTFP (non-timber forest products) Fires Introduction of alien species
Livestock raising	Overgrazing Rangeland management, use of fire, water management
Agriculture	Extension of agricultural land Shifting cultivation Intensification Irrigation and water use Pest control Agricultural practices
Energy production and use	Sources of energy Energy consumption Energy efficiency
Urbanisation, infrastructure and industry	Urban growth and sprawl, urban planning, dams, roads, major infrastructure, polluting industries, tourism
Waste disposal and management	Waste production Waste management Public behaviour and practices, existing systems, hazardous waste management
Atmospheric emissions	Emissions of greenhouse gases and ozone-depleting substances Air pollutants affecting local or regional air quality (pointsource and non-point source emissions)

As far as possible the driving forces influencing these pressures should be identified, such as economic incentives, demographic pressure, access rights to natural resources and land tenure systems.

Environmental trends should be assessed with regard to their social and economic impact, including:

- Declines in economic production or productivity (e.g. agriculture, forestry, fisheries);
- Threats to human health;
- Human exposure to environmental disasters (e.g. floods, drought);
- Conflicts and security;

- Impact on poverty and on vulnerable groups (including women, children and indigenous peoples);
- Sustainability of resource use;
- Cultural values.

This Chapter should lead to the identification of problems, described in terms of situations or trends that are undesirable due to their current socioeconomic consequences (e.g. falling productivity, health problems, natural risks, social crises, conflicts), their future consequences (e.g. decline in natural resources, cumulative pollution) or their contribution to global environmental problems.

If appropriate the consultant could refer to appropriate environmental indicators in order to establish a consistent basis both for comparisons among countries and for monitoring changes in the studied country. Attention should be paid to the MDG 7⁹ indicators, and specific indicators related to the particular environmental issues of the country.

If appropriate, the information could be organised according to eco-geographical subdivisions with the scale (regional, national, local) of the issues indicated.

3.2. Environmental policy, legislation and institutions

A brief description and review should be provided of the strengths and weaknesses of the following aspects, with their associated evaluation criteria given for guidance:

Aspect	Evaluation criteria
Policies	Existence of national policies, strategies and action plans for the environment; including possible National Strategy for Sustainable Development (NSSD) and National Environmental Action Plans (NEAP). Policy response to global issues, sustainability issues (depletion of natural resources), and specific environmental issues identified above. Consistency between policies. Environmental integration in sectoral and macro-economic policies and existence of SEA of policies or strategies (especially the PRSP if relevant). Important measures taken by the Government to solve environmental concerns. Effectiveness in achieving targets.
Regulatory framework, including EIA and SEA legislation	Ratification status and implementation of MEAs (Multilateral Environment Agreements) such as those concerning climate change, biodiversity and desertification. Adequacy of (current and in preparation) environmental legislation (including land tenure and land reform, access rights to natural resources, management of natural resources, requirements for environmental assessment such as for EIA and SEA, pollution control,

⁹ See <http://www.undp.org/mdg/>

	<p>development control).</p> <p>Provision and procedures for public participation in environmental issues.</p> <p>Effectiveness of legislation enforcement.</p> <p>Use of other (non legislative) instruments, e.g. “green budgeting” (or Environmental Fiscal Reform) and market-based mechanisms, voluntary schemes (environmental management systems, environmental labelling, industry-government agreements).</p> <p>Potential impact of non-environmental legislation.</p>
Institutions with environmental responsibilities	<p>Identity, number and quality of institutions (involved in policy making, legislation, planning, environmental protection, monitoring and enforcement).</p> <p>Level of co-ordination and decentralisation.</p> <p>Strength and capacity of individual institutions.</p> <p>Influence on other institutions.</p> <p>Good governance practices.</p> <p>Capabilities, means, functioning of environmental services.</p> <p>Major NGOs, institutes or other organisations involved in environmental management or policy.</p>
Public participation	<p>Transparency and access to environmental information.</p> <p>Role of NGOs and civil society in environmental decisionmaking.</p> <p>Effective participation.</p> <p>Access to justice in environmental matters.</p>
Environmental services and infrastructures	<p>Protected Areas: number, areas, relevance, and effectiveness.</p> <p>Sanitation and waste treatment infrastructure.</p> <p>Disaster prevention systems.</p> <p>Emergency response mechanisms.</p>
Environmental monitoring system	<p>Relevance of selected indicators (with reference to MDG7).</p> <p>Measurement of the indicators: periodicity, liability.</p> <p>Integration in the general development indicators.</p>

The analysis should both identify potential institutional/policy/regulatory causes of environmental pressures and the response by the government to solve the environmental problems.

3.3. Integration of environmental concerns into the main policies and sectors

The assessment should examine the integration of environmental concerns in the overall development policy and in sectors/areas that have key linkages with environmental issues and which might be identified for EC support, taking into account the focal areas of the current CSP.

This section should examine whether there is a Strategic Environmental Assessment (or similar assessment) for the national development strategy or the Poverty Reduction Strategy and for the sectors. If an SEA exists, it should provide a brief description of it, including its main recommendations. The main legislation and institutional arrangements and measures of the sector which address environmental issues, especially those identified in section 4.1 should be examined.

3.4. EU co-operation with the Country from an environmental perspective

This section should review the past and current experience relating to development co-operation interventions with specific environmental objectives as well as the integration of environment into other co-operation areas, including the application of environmental integration procedures (preparation of SEA or EIA in EC funded programmes/projects). Where information is available the environmental impacts or potential risks of EU co-operation should be identified for the benefit of future programmes. The results of existing evaluations/reviews should be incorporated and lessons drawn for the future. The implications for the environment of budgetary support or sector wide approaches should be reviewed if these have been applied. The review should cover both geographical and thematic programmes.

3.5. Co-operation funded by other donors from an environmental perspective

This section should review the past and current involvement of other donors and their experience in the Country, and include a list of recent and planned projects/programmes with an environmental focus or anticipated impact. Co-ordination mechanisms between donors and the EC with respect to the environment should be assessed.

4. CONCLUSIONS AND RECOMMENDATIONS

The key aspects of the state and trends of the environment in the Country, including policy/regulatory and institutional constraints and challenges, should be clearly stated. These may be presented in a matrix, crossing environmental concerns and the main sectors or policies.

Based on a comprehensive assessment of the available information and on consultations with stakeholders, recommendations should be made on how the Commission and the Government can better mainstream the environment into the next Country Strategy Paper, taking into account current CSP and any pre-identified options for the next one, including the anticipated focal sectors.

Recommendations should address (but not necessarily be limited to) the following:

(6) Recommendations concerning the selection of the focal sectors and response strategies, based on environmental considerations. These recommendations should show how best to address the main environmental challenges identified by the CEP. This might be done by selecting environment as a focal area and/or, more frequently, through environmental safeguards in other areas. These may include, for example, proposals for institutional strengthening and capacity building (including the enhancement of the regulatory framework

and enforcement capacities) or recommendations for initiating an appropriate Strategic Environmental Assessment (SEA) process.

(7) Recommendations on the use of EC horizontal budget lines (such as Environment and Forests) and facilities (EU Water Facility - EUWF and the EU Energy Facility - EUEF).

(8) Opportunities for co-ordination on environmental issues with other donors, seeking to achieve complementarities and synergies in order to more effectively deliver development objectives.

(9) Proposals for environmentally-relevant indicators to be used in the NIP (National Indicative Programme) or to be considered during the formulation of a GBS or SPSP (if relevant). Individual recommendations should be clearly articulated and linked to the problems to be solved and grouped according to the sector concerned or institutional stakeholder. The relative priority of the recommendations and an indication of the challenges to their implementation should be given. Any constraints to preparing the profile resulting from limited information should be described.

5. WORK PLAN

The work plan should include but not necessarily be limited to the following activities:

- Consultations with EC country desk officers and other relevant officials, EC Delegation, the national environmental authority and a selection of national and local authorities, key international donors, plus key national and international civil society actors operating in the environmental field.
- Review of key documents and reports, including the National Environment Action Plan, the National Sustainable Development Strategy, State of the environment Reports, Country Environmental Profiles (EC and others); the current EC Country Strategy Papers; evaluation reports, existing Strategic Environmental Assessments (particularly those concerning potential focal sectors), EIA of EC funded projects; environmental literature, environmental policy and regulatory framework, legislation, regulations and enforcement relating to environmental issues, information on monitoring and environmental performance indicators.
- Field visits to sites of key environmental concern and (if possible) the organisation of a national workshop that national authorities, donors, experts and representatives of civil society should be invited to participate with the aim of clarifying and validating key environmental concerns.
- On the basis of the outline work plan and time schedule given in these Terms of Reference, a detailed work plan should be proposed.

6. EXPERTISE REQUIRED

The proposed mission shall be conducted by a team of (two) experts who should have the following profile:

- Expert level I with at least 15 years wide experience in environmental issues, including institutional aspects; international environmental policies and management; environmental assessment techniques and experience in rapidly assessing information and developing recommendations. He/she would be the team leader.
- Expert level II with 10 years experience and with an environment background complementary to the team leader.

In addition:

- Previous working experience in the Country or the region is requested for at least one team member;
- Experts should have an understanding of the EU environment and development policies;
- Experience in undertaking environmental analyses and preparation of development programmes would be an asset;
- Familiarity with Commission guidance on programming, country strategies, PCM, policy mix and integration of environmental issues into other policy areas is desirable;
- Experience of participatory planning processes would be an advantage.

The experts should have excellent in drafting and presentation skills. Consultants must be fluent in English as the final report must be presented in English (knowledge of Chichewa would be an asset).

7. REPORTING

The results of the study should be presented in the Country Environmental Profile in the format given in section 10 of these ToR. The final draft profile, in five hard copies and electronic version (Microsoft Word), should be presented to Head of European Commission Delegation in Malawi by 15 August 2006 at the latest. Within 3 weeks, comments on the draft report will be received from the EC. The consultants will take account of these comments in preparing the final report (maximum 40 pages excluding appendices). The final report in English in 5 hard copies and 5 CD RoMs with an electronic version (Microsoft Word) is to be submitted by 5 September 2006.

8. TIME SCHEDULE

	Expert I	Expert II
Tentative date for selection of contractor: 27 June		
Tentative start date†: 11 July		
Desk analysis, including briefing in Lilongwe, Malawi*	6	6
Field phase including travel and possible workshop*	15	15
Draft Report finalisation	3	3
Debriefing and submission of Draft Report in Lilongwe-not later than 15 August	1	1
Final report 5 September	1	0
Total days	26	25

† If the experts can mobilise sooner so much the better

* The delegation will allow flexibility between desk and field phases but this should be agreed with the Delegation in advance

The assignment totals 51 working days (26 for Expert I and 25 for Expert II) over a period of 35 calendar days (5 weeks). All but one day for Expert I is expected to be completed in country. One workday will be paid for Expert 1 to allow incorporation of comments on the draft report (no per diem). Consultants may wish to shorten the period in country by working 6 days a week but this must be agreed beforehand with the delegation. If that is the case then deadlines for debriefing and submission of Draft Report will be brought forward accordingly.

BUDGET

9. STANDARD REPORT FORMAT FOR A COUNTRY ENVIRONMENTAL PROFILE

Maximum length (excluding appendices): 40 pages. The following text appears on the inside front cover of the report: This report is financed by the European Commission and is presented by [*name of consultant*] for the Government of Malawi and the European Commission. It does not necessarily reflect the opinion of the Government of Malawi or the European Commission.

1. Summary

The summary should succinctly and clearly present the key issues described in the profile following the order of headings 2 to 5 given below. The Summary should not exceed 6 pages.

2. State of the environment**3. Environmental policy, legislative and institutional framework**

3.1. Environmental policy and legislation

3.2. Environmental legislation and institutional framework

3.3. Integration of environmental concerns into the main sectors

4. EU and other donor co-operation with the Country from an environmental perspective**5. Conclusions and recommendations****6. Country Strategy Paper Environmental Annex Summary**

Comprising the main issues presented in sections 2 to 4 above (excluding section 5) in not more than 4 pages.

7. Technical appendices

I. Environmental maps of the Country

II. Reference list of environmental policy documents, statements and action plans, and other relevant technical information.

8. Administrative appendices

I. Study methodology/work plan (1–2 pages)

II. Consultants' Itinerary (1–2 pages)

III. List of persons/organisations consulted with their affiliation and contact details (1–2 pages)

IV. List of documentation consulted (1–2 pages)

V. *Curricula vitae* of the consultants (1 page per person)

VI. Terms of Reference for the Country Environmental Profile