Introduction: PEI in Malawi

Malawi is heavily dependent upon renewable natural resources including land, soils, forests, water, fisheries and air. For example, some 80% of the population is involved in subsistence agriculture and the majority of the nation's export earnings are derived from tobacco, cotton and other agricultural commodities. Other key natural resources include fisheries which provide employment for over 400,000 and livelihoods for nearly 2 million Malawians. Forest resources also provide important livelihoods opportunities, particularly given that 93% of national energy demand is provided by firewood and charcoal with the remainder provided by hydroelectric power and imported fuels. At household level 99% of energy demand is met by biomass.

Whilst the nation is reliant upon its renewable natural resource base there is considerable evidence that these key assets are degrading rapidly. Deforestation is very high at an estimated 2.8% *per annum* and annual soil erosion occurs at rates of up to 43 metric tonnes per hectare. The impact of such natural resource degradation upon household incomes and the national economy has been low agricultural productivity particularly for small-holder farmers who contribute 70% of agricultural output. Average smallholder agricultural growth has been negative at minus 1.8% *per annum* between 2000 and 2005 although the last two years have seen improved harvests.

Unsustainable natural resource degradation has social and health as well as economic consequences. Fisheries landings for instance have fallen to an average 45,000 metric tonnes *per annum* in 2006 down from 76,500 metric tonnes in 1990. Consequently per capita fish consumption has fallen from 10.2 to 4.8 kg from 1990 to 2006. Health statistics for Malawi demonstrate the consequences of food insecurity with some 44% of children under 5 chronically malnourished and experiencing stunting. Over half the population lives below the poverty line and more than 20% are unable to meet their minimum food requirements. The majority of those living in ultra poverty are women and children.

The Malawi Growth and Development Strategy (MGDS) 2006-11 sets out the Government of Malawi's (GoM) approach to tackling poverty and stimulating economic growth. This can be achieved with sustainable environment and natural resources management (ENRM).

Purpose/Objectives of Economic Study/Tool

The Government of Malawi (GoM) is implementing the Malawi Poverty and Environment Initiative (MPEI) with support from the Global Poverty and Environment Initiative of the United Nations Development Programme (UNDP) and the United Nations Environmental Programme (UNEP). MPEI's broad aim is to

enhance the contribution of the sustainable ENRM to poverty reduction, food security and economic growth, and to facilitate the achievement of both the Malawi Growth and Development Strategy (MGDS) and the Millennium Development Goals (MDGs).

This Economic Study is conducted within the context of the MPEI project. The primary aim of the study is to provide evidence on the costs and benefits of sustainable and unsustainable natural resource management (NRM) in Malawi, for four selected natural resources: forestry resources, fisheries resources, wildlife resources and soils. The analysis establishes linkages between natural resource management on the one hand, and poverty reduction, economic well-being and development on the other. Further, it draws on case study and other evidence to assess the net benefits of key interventions to encourage more sustainable natural resource use in each selected ENRM sector.

Methodology

The Consultants in consultation with the PEI Technical Committee identified four key natural resources to conduct economic analyses on. These key natural resources are soils, forests, fisheries and wildlife. The study employed different methods to come up with the report:

1. Data Collection and Establishment of a Baseline and Trends

2. Detailed studies on how environmentally sustainable natural resource use can contribute to achievement of national development priorities, including food security and poverty reduction
3. Expert review of the content of the report

Key Finding/Recommendations from Study

1. Valuing the macro-economic contribution of natural resources

The economic contribution made by renewable natural resources to Malawi is very significant but is not adequately captured in official statistics. Part of the problem lies with how national income is measured – estimates of Gross Domestic Product (GDP) do not record the contribution of soils or wildlife. Even where natural resource use is recorded in GDP (as with forestry and fisheries) the values tend to be understated.

For example official GDP figures in Malawi significantly understate the true contribution of forestry by not capturing the extensive use of wood for fuel.

In this study these valuation issues were addressed as follows:

2. *Contribution of renewable natural resources to GDP*

Table i below summarises the contribution of forestry, fisheries and wildlife resources to GDP in official statistics and estimates using recently published specialist studies.

Table i: Contribution of Natural Resources to GDP

Natural Resource	*Share of GDP by Official Statistics*	*Additional contribution identified*	*Total share of GDP*	*Sources of new evidence*
Forestry	1.8%	4.3%	6.1%	BEST (2009) – charcoal & firewood
Fisheries	4.0%	-	4.0%	
Wildlife	-	2.7%	2.7%	WTTC (2009) – nature-based tourism
Total	5.8%	7.0%	12.8%	

Even viewed through the narrow prism of GDP statistics, the contribution of renewable natural resources is striking. The large contribution of charcoal and firewood is omitted in official statistics. In contrast, the contribution of the tourism and travel industry is included but the key role of wildlife (and the ecosystems that support this) is not quantified.

3. The macro-economic cost of unsustainable natural resource use

Table ii summarises the base case estimates of the cost of unsustainable natural resource use and the source of these costs for each natural resource.

Malawi pays a high price for unsustainable natural resource use. This cost is equivalent to giving up 5.3% of GDP each year. To put this in context, the MGDS aims for *total* annual GDP growth of 6%. Malawi

would be richer by MK 26.6 billion (US$191 million) each year in 2007 prices if soil, forest, fishery and wildlife resources were used sustainably. This is more than the total funding allocated to the education sector and to the heath sector in the 2009 Budget.

Table ii: Economic Costs of Unsustainable Natural Resource use

Natural Resource & source of cost – base case	*Annual cost (2007 prices)*			*Discounted cost of damage over 10 years*	
	MK Million	*US$ Million*	*% of GDP*	*MK Million*	*% of GDP*
Soils:	8,988	65	1.9%	40,665	8.2%
On-site impact on agriculture	7,540	54	1.6%	30,915	6.3%
Off-site impact on hydropower	1,433	10	0.3%	9,688	1.9%
Off-site drinking water treatment	15	0	0.0%	62	0.0%
Forests:	12,983	93	2.4%	31,795	11.0%
Unsustainable roundwood (excl fuelwood)	3,100	22	0.4%	12,710	2.4%
Unsustainable fuelwood	6,089	44	1.2%	2,495	4.8%
Flood prevention (indicative only)	232	2	0.2%	1,987	0.8%
Indoor air pollution	3267	23	0.7%	13,394	2.7%
Outdoor air pollution - WB 2002	327	2	0.2%	2,417	0.5%
Fisheries:	3,906	28	0.8%	7,666	1.5%
Unsustainable use (lower bound)	3,906	28	0.8%	7,666	1.5%
Wildlife:	665	5	0.1%	2,730	0.5%
Poaching loss (indicative only)	665	5	0.1%	2,730	0.5%
Total	26,573	191	5.3%	84,064	21.4%

4. Unsustainable natural resource use and Adjusted Net Savings

The World Bank has estimated ANS for 2006 for Malawi as being 12.24% of Gross National Investment (GNI), indicating that national wealth is increasing. However, this estimate excludes the latest evidence on deforestation from woodfuel use, the cost of soil nutrient losses, estimates of the costs of indoor air pollution or any estimates for the fishery or wildlife resources. By including these items (from Table 1

deflated to 2006 prices) we find that the country's ANS for 2006 falls to 7.14% of GNI (see Table iii). What is particularly troubling is that the contribution to national wealth from educating the nation is outweighed by the loss of wealth from natural resources degradation.

Table iii: Adjusted Net Savings for Malawi

	WB (2006)	*WB+Authors*
	% of GNI	*% of GNI*
Gross National Saving (various methods used)	15.69	15.69
- Consumption of Fixed Capital	7.30	7.30
= Net National Saving	8.39	8.39
- Education Expenditure	4.87	4.87
- Energy Depletion	0.00	0.00
- Mineral Depletion	0.00	0.00
- Net Forest Depletion	0.64	2.05
- Soil Erosion		2.01
- Fishery depletion (lower bound)		0.87
- Wildlife depletion (indicative)		0.15
- CO_2 damage	0.22	0.22
- PM10 damage (Outdoor air pollution WB 2002)	0.16	0.16
- Indoor air pollution		0.66
= Adjusted Net Saving	12.24	7.14

Use of study findings in PE mainstreaming

The economic analysis results are quite instrumental in the mainstreaming of environment i Government planning and budgeting processes:

1. A tool by Ministry of Development Planning and Cooperation to integrate ENRM in the National Development Planning Processes such the successor MGDS
2. A basis to review policies to incorporate poverty-environment issues e.g Forestry Policy, Fisheries Conservation and Aquaculture Management Act, 1997

3. Incorporation of ENRM into the Guide for Executive Decision Making Processes Handbook in the Office of the President and Cabinet (OPC)
4. Development of Sustainability indicators for the Monitoring and Evaluation Framework of the Agriculture Sector wide Approach (ASWAp)
5. Compilation of socioeconomic issues affecting the environment in the Environmental Outlook Report (EOR)
6. Integration of ENRM into the Budgeting Process
7. Promotion of energy efficient stoves

Challenges, lessons learned and recommendations

1. The study has taken unnecessarily long due to lack of capacity to conduct such detailed analysis
2. The consultative process requires heavy investment and patience
3. The results are not acceptable to all stakeholders due to their mandate influence
4. The analysis is quite instrumental in convincing decision makers to invest in ENRM