

**A NOTE ON**

**THE SITUATION AND CHALLENGES**

**OF**

**ENVIRONMENTAL STATISTICS IN**

**MALAWI**

## Table of Contents

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1.0 INTRODUCTION.....	1
1.1 Country Profile.....	1
2.0 ENVIRONMENTAL ISSUES.....	1
3.0 COLLECTION AND DISSEMINATION OF ENVIRONMENTAL STATISTICS.....	2
3.1 Collection of Environmental Data .....	2
3.2 Dissemination of Environmental Statistics.....	3
4.0 CHALLENGES IN ENVIRONMENTAL STATISTICS .....	4
4.1 Data Quality and Completeness .....	4
4.2 Inadequacies in the National Statistic System .....	4
4.3 Gaps in Mainstreaming of Data Collection by Ministries/Departments .....	4
5.0 ENVIRONMENTAL INDICATORS.....	5

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## **1.0 INTRODUCTION**

### **1.1 Country Profile**

Malawi, a republic in southeastern Africa, is located south of the equator between latitudes 9 degrees and 45 minutes and 17 degrees 16 minutes and from longitudes 33 degrees and 35 minutes. The country is bordered on the north by Tanzania, on the east, southeast and south by Mozambique, and on the west by Zambia. Malawi extends about 835 km north to south and varies in width from about 80 to 160 km. The total area of the country is 118,484 sq km, nearly one-fifth of which is covered by water, mainly Lake Malawi and three other smaller lakes.

Part of the Great Rift Valley runs through Malawi from north to south. In this deep trough lies Lake Malawi, the third largest lake in Africa. The Shire River flows from the southern end of the lake to the Zambezi River in Mozambique. To the east and west of the Great Rift Valley the land rises to form high plateaus, generally about 900 to 1,200 m in elevation but reaching about 2,400 m in the Nyika uplands in the north. South of Lake Malawi is the Shire Highlands, which rise to more than 2,700 m. Sapitwa (Mount Mulanje), central Africa's highest peak at 3,002 m is here.

The climate in Malawi varies with the elevation. In the low-lying Shire Valley it is hot and humid, with temperatures ranging from 21°C (69°F) to 29°C (84°F) depending on the season. In the highlands the climate is more equable. The rainy season lasts from November to April. Annual rainfall averages about 2,300 mm (about 90 in) in the highlands and about 800 mm (about 30 in) in the lowlands.

The resources of Malawi are almost entirely agricultural. Mineral wealth is slight, although some marble and limestone are produced. A thin forest of small trees covers large parts of the country, and some timber trees grow in the damp ravines of the mountains and along the riverbanks. Baobab, acacia, and conifers grow in the highlands.

Animal life in Malawi includes elephants, rhinoceroses, giraffes, zebras, monkeys, and several varieties of antelope. Hippopotamuses inhabit the lake shores. Snakes and other reptiles, birds, and insects are plentiful, and the rivers and lakes abound in fish.

## **2.0 ENVIRONMENTAL ISSUES**

Malawi has a rich and diverse wildlife population, and about 28 percent of the country's total land area remains forested. Experts believe that Lake Malawi has more endemic species of fish than any other lake in the world. Of the country's total land area, 8.9 percent is designated protected. Lake Malawi National Park, at the southern end of the lake, was declared a World Heritage Site in 1984. Poaching continues to be a problem in the protected areas. The government has ratified international environmental agreements pertaining to biodiversity, climate change, desertification,

endangered species, environmental modification, hazardous wastes, marine life conservation, ozone layer protection, and wetlands.

Nevertheless, Malawi continues to face environmental degradation due to high population density and a high population growth rate. The population of Malawi is estimated at 13 million. The country has an overall population density of 98 persons per sq km, one of the highest in Africa.

Malawi is basically an agro-base economy. Use of traditional fuels, particularly fuelwood and charcoal, is so pervasive accounting for 90 percent (2004<sup>1</sup>) of the country's households. A very small proportion of the population (16 percent) has electricity within 100 meters of their dwelling. The high population density and dependence on the land put great pressure on the environment for more farmland and fuelwood. Malawi has one of the highest rates of annual deforestation in Africa, at 2.4 percent (1990–2000).

Unsafe sewage disposal, agricultural runoff, and soil erosion due to deforestation combine to contaminate much of the country's fresh water. Only 64 percent of the population has access to an improved water source while 62 percent has access to improved sanitation. Traditional means of rubbish disposal account for nearly half of the country's population. Use of traditional farming methods and poor land management have resulted in heavy soil erosion that causes siltation of rivers and streams thereby endangering aquatic life.

Environmental statistics is vital for monitoring the situation of the environment and natural resources in the country for informed decision.

## **3.0 COLLECTION AND DISSEMINATION OF ENVIRONMENTAL STATISTICS**

### **3.1 Collection of Environmental Data**

The National Statistical Office (NSO) established after independence in 1964 and operating through the National Statistics Act, 1967 is mandated to collect, compile, analyze, abstract and publish major statistical information on a wide range of topics including environment. However, the National Statistic System is partly decentralized. This implies that other Government ministries/departments collect and compile statistics relevant to their situation. The NSO takes a coordinating role in the collection and compilation of statistics to minimize redundancy, omission, inconsistencies and duplication. Statistics collected by the NSO, other Government Ministries and Departments are called official statistics. Data and information collection is done through censuses, surveys or administrative records. Other participants in environmental data and information collection include the research institutions, the academic, private sector and NGOs but access to this information may be limited as the data is mostly for internal use.

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<sup>1</sup> Second Integrated Household Survey, 2004-2005, National Statistics Office

The national frame environmental law on environment, Environment Management Act 1996, provides for preparation of the state of environment reports (SOER) both at national and local levels in the country every 3 to 5 years. The major objectives of the state of environment report are to:

- provide the people of Malawi and decision makers with accurate, timely and accessible information concerning the state of the environment in Malawi;
- increase public understanding of environmental issues and problems in Malawi and at the same time seek public support and participation in addressing them;
- provide information on the progress the government and cooperating partners has made in addressing environmental problems;
- produce a baseline for key environmental indicators in Malawi against which changes in the state of the natural resources and the environment can be monitored; and
- provide a framework for monitoring impacts of international conventions treaties on Malawi's natural resources and the environment.

The National Environmental Action Plans developed and adopted in 1994 after the 1992 Rio Summit (revised in 2002) outline a number of environmental problems the country is facing including deforestation, soil erosion, loss of biological diversity, depletion and degradation of water resources, habitat destruction, loss of fish resources, and air pollution and climate change. These problems, among other factors, are a result of high population growth rate and poverty.

Environmental data and information collection done through the State of Environment Reporting process follows the pattern of environmental problems the country is facing. The environmental statistics indicators are compiled following a Drivers, Pressure, State, Impact, and Response (DPSIR) framework.

However, data collection is the responsibility of the sectors participating in the process. These include Ministries and Departments responsible for water resources, meteorological services, agriculture, wildlife and national parks, fisheries, forestry, energy, mining, land and housing, health, labour and environment. In most cases, secondary data is used and this confirms the fact that data collection is done by respective Ministries and Departments.

### **3.2 Dissemination of Environmental Statistics**

The primary method used in disseminating official statistics is through paper based printed reports and publications. These are reports of surveys, or regular publications consisting statistics collected on regular basis and the district and national state of environment reports. Data and information are also disseminated electronically through CD-ROMs, floppy disks, flash disks, emails and internet. The NSO publishes most data on its website at <http://www.nso.malawi.net>. A socio-economic database of indicators can also be accessed on the following address [www.maseda.malawi.net](http://www.maseda.malawi.net). The state of environment Reports are available on <http://www.sdn.org.mw/environment> and other websites. Data is disseminated in tables, charts and maps.

## **4.0 CHALLENGES IN ENVIRONMENTAL STATISTICS**

A number of challenges exist in environmental data in the country including the following:

### **4.1 Data Quality and Completeness**

Data quality and completeness are the major challenges contributing to inadequacies in environmental statistics in the country. Data quality is affected due to age of data set, inadequate methods of data collection, analysis and interpretation. Most of the data sets are quite old as data collection is mostly at the discretion of the institution collecting the data on their routine schedules. Scale and resolution is another limitation in environmental data collection, particularly spatial data. This could be due to the age of equipment used in data collection and absence of data standards.

### **4.2 Inadequacies in the National Statistic System**

The national statistic system which is based on the provisions of the National Statistical Act, 1967, does not adequately cover environmental data. This is understood since issues of environment become clearer after the 1992 Rio Summit. Fortunately the National Statistic System is currently undergoing review to include other important aspects of the country's socio-economic development issues including the environment. In the 2007-2011 Strategic Plan, the National Statistics Office has proposed establishing a section specifically responsible for environmental statistics.

### **4.3 Gaps in Mainstreaming of Data Collection by Ministries/Departments**

The National Statistic system is partly decentralized, thereby empowering Ministries/Departments to collect, compile, analyse and disseminate data own their own. This arrangement makes it difficult for data to be up-to-date as data collection schedules are determined by the respective institutions. In most cases the institutions do not have clear mandates in activities related to data collection. This entails that data collection is not given adequate financial and human resources and this is reflected in the annual budgets of various government ministries and departments.

## 5.0 ENVIRONMENTAL INDICATORS

Table below provides details of some of the major environmental indicators compiled in Malawi and their unit of measurements, data source, periodicity of collection, method of collection and their limitations.

Indicator Category	Indicator	Unit of Measurement	Data source	Periodicity of Collection	Method of Collection	Limitation (s)
1. Climate and Air Quality	Rainfall	Millimeters	Department of Meteorological Services	Annual	Routine	Few Meteorological Stations in the country
	Temperature	Degree Celsius	Department of Meteorological Services	Daily/Monthly	Routine	
	Wind speed	Kilometers/hour	Department of Meteorological Services	Daily/Monthly	Routine	
	Relative humidity		Department of Meteorological	Daily/Monthly	Routine	
	Green house gas emissions	Tonnes	Environmental Affairs Department	5 years	Surveys	Inadequate capacity in assessment of the gases (Equipment & Personnel)
	Consumption of Ozone Depleting Substances	Tonnes	Environmental Affairs Department	5 years	Surveys	
	Incidence of droughts, land slides & floods	Number	Department of Meteorological	Annual	Routine	
2. Demographic	Population size	No. of people (Million)	National Statistical Office (NSO)	10 years	Census	
	Population growth rate	Percentage	NSO	10 years	Census	
	Population Density	Persons per sq.km	NSO	10 years	Census	
	Population Distribution	Age, location, sex,	NSO	10 years	Census	
3. Soil and Land Resources	Soil erosion	Tonnes/ha	Ministry of Agriculture and Food Security	annual	Routine	
	Crop yields	Tonnes/ha	Ministry of Agriculture and Food Security /Department of Forestry	annual	Routine/surveys	
	Soil types	Soil properties (pH, bulk	Ministry of Agriculture and	adhoc	surveys	

		density, soil aggregate etc.)	Food Security			
	Household land holding size	Hectares	Ministry of Agriculture and Food Security	annual	Routine	
	Fertiliser Consumption	Tonnes	Ministry of Agriculture and Food Security	annual	Routine	
	Crop area	Hectares	Ministry of Agriculture and Food Security	annual	Routine	
	Change in land cover	Percentage	Ministry of Agriculture and Food Security /Department of Forestry	annual	Routine/surveys	
	Land utilisation	% of land area	Ministry of Agriculture and Food Security /Department of Forestry	annual	Routine/surveys	
4. Forestry Resources	Consumption and supply of wood	Tonnes of timber, poles, fuelwood	Department of Forestry	Annual	Routine	
	Deforestation	Tonnes of trees cut per hectare/year or percentage of forest area cleared	Department of Forestry	Annual	Routine	
	Afforestation	Hectares of land planted to trees	Department of Forestry	Annual	Routine	
	Encroachment in protected areas	Number of forest reserves encroached/ No. of encroachers	Department of Forestry	Annual/adhoc	Routine	
	Illegal Charcoal production	Tons of charcoal	Department of Forestry	Annual/adhoc	Routine	
	Forest fires					
5. Human Habitat, Development and Environment	Access to safe water	% of population	Ministry of Health/Ministry of Water Resources and Irrigation/NSO	Annual	Routine	
	Access to Sanitation facilities	% of population	Ministry of Health/Ministry of Water Resources and Irrigation/NSO	Annual	Routine	
	Access to basic	% of	Department of	Annual	Routine	



	shelter	population	Housing/NSO			
	Access to Health Services	% of population	Ministry of Health/NSO	Annual	Routine/Surveys	
6. Fisheries	Annual catches by fish major species	Tonnes	Department of Fisheries	Annual	Routine	
	Fish landings by major water bodies (Lakes & Rivers)	Tonnes	Department of Fisheries	Annual	Routine	
	Fish ponds & Fish farmers	Number	Department of Fisheries	Annual	Routine/Surveys	
	Fishing Vessels , Fishers and Gears	Number	Department of Fisheries	Annual	Routine/Surveys	
7. Water Resources	Annual Mean Levels for Lakes	Metres above mean sea level	Ministry of Irrigation & Resources	Annual	Routine	
	Water Supply & Consumption	Cubic Metres	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	Water Flow in selected rivers	Annual mean flows in Cubic Metres/second	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	Annual Run-off in selected rivers	Cubic Metres	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	Siltation of water bodies	Metres	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	State of BOD in water bodies	Milligram/litre	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	Concentration of nitrates in water bodies	Milligram/litre	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	Concentration of suspended solids in water bodies	Milligram/litre	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	Number of dams/Reservoirs /Weirs	Number	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	Rural gravity water supply schemes	Number	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	Access to potable (piped) water	% of population	Ministry of Irrigation &	Annual	Routine	

			Resources /Water Boards/NSO			
	Number of boreholes	Number	Ministry of Irrigation & Resources /Water Boards/NSO	Annual	Routine	
8. Biological Diversity	Species of fauna (mammals, amphibians, reptiles, birds, fish, invertebrates, domesticated) and flora	Number	Department of National Parks & Wildlife	Annual	Routine	
	Population of wild animals in Game Reserves & National Parks	Number	Department of National Parks & Wildlife	Annual	Routine	
	Number of Poachers	Number	Department of National Parks & Wildlife	Annual	Routine	
	Endangered wildlife fauna and flora Species	Number	Department of National Parks & Wildlife	Annual	Routine	
	Number of Protected areas	Number	Department of National Parks & Wildlife	Annual	Routine	
	Wetlands of International Importance	Number	Department of National Parks & Wildlife	Annual	Routine	
9. Industry, Energy & Mining	Registered Enterprises	Number	Ministry of Trade and Industry	Annual	Routine	
	Employment by Industry	Percentage	Ministry of Labour /NSO	Annual	Routine	
	Number of Industries & their location distribution	Number/Percentage	Ministry of Trade and Industry/NSO	Annual	Routine	
	Companies certified by ISO 14001 management system	Number	Malawi Bureau of Standards	Annual	Routine	
	Mineral Production and Exportation/Importation	Tonnes	Department of Mines	Annual	Routine	
	Number of mining licenses granted	Number	Department of Mines	Annual	Routine	
	Number of mining accidents	Number	Department of Mines/Ministry	Annual	Routine	

			of Labour			
10. Environmental Education & Awareness	Subjects carrying Environmental Messages (Primary, Secondary, Tertiary)	Number	Ministry of Education	Adhoc	Survey	
	Access to education Facilities	Number	Ministry of Education	Adhoc	Survey	
	Literacy levels	Percentage	Ministry of Education/NSO	Annual	Routine	
	Number of Environmental programmes and awareness campaigns	Number	Environmental Affairs Department	Annual	Routine	
10. Environmental Management Framework	Number of Environmental Policies, Laws and Projects/Programmes	Number	Environmental Affairs Department	Annual	Routine	
11. Health	Health facilities and Services	Number	Ministry of Health	Annual	Routine	
	Prevalence of diseases (HIV/AIDS, Malaria, TB, Diarrhoea)	Number	Ministry of Health	Annual	Routine	
	Number of Sicknesses, Deaths and Births	Number	Ministry of Health/NSO	Annual	Routine	
	Fertility & Family Planning	Number	Ministry of Health/NSO	Annual	Routine	
	Number of Health Personnel	Number	Ministry of Health	Annual	Routine	

Source: National Statistical Office and Environmental Affairs Department

## References

- Statistical Year Book, 2006. National Statistical Office
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- Integrated Household Survey 2004-2005