

ENVIRONMENT STATISTICS IN ZIMBABWE:

**A COUNTRY PAPER FOR THE ENVIRONMENT STATISTICS
WORKSHOP,**

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Country Background

Zimbabwe is situated in the southern part of Africa between latitudes 15° 30" and 22° 30" south of the Equator and between longitudes 25° and 33° 10" east of the Greenwich Meridian. The country is completely land locked and is bordered by Mozambique to the East, South Africa to the South, Botswana to the West and Zambia to the North and North-west.

The principal physical feature is high plateau/high veld, that stretches from south west to north east across the whole country. The plateau is 650 kilometres long, 80 kilometres wide and lies mostly at an altitude between 1 200 and 1 500 metres above sea level. The spine slopes down north-ward to the Zambezi River and South-ward to the Limpopo River. This wider plateau is the middle veld and has an altitude between 600 to 1200 metres. Beyond this lies the low veld with an altitude below 600 metres.

Zimbabwe has a total land area of approximately 390 757 square kilometres and is divided into ten administrative provinces. Harare is the capital city and it has all the major administrative and commercial functions and Bulawayo is the second largest city. Both cities are essentially urban provinces while the rest are mixed. In 2002 the country had an estimated population of 11,6 million, out of these 5,6 million were males and 6,0 million were females. Thirty-five percent of the country's population lives in urban areas while the rest live in rural areas.

The country has abundant natural resources that include beautiful scenery, arable land, forests, minerals, and surface and ground water. Zimbabwe has 12 national parks, one transfrontier park (Trans Zambezi National Park), and other protected areas. The flora in the country is dry miombo woodland, with mopane woodland and other woodlands types dominating while serpentine grasslands are found in the Great Dyke. Montane forest interspersed amongst high-altitude grasslands and heath is found in the Eastern Highlands (SABONET Report No. 14, 2002)

Altitude, aspect and proximity from the Mozambique Channel moderate the climate of Zimbabwe. The influence of the mid-continental high pressure induces calm and sunny weather from May to September and the southward movement of the Inter-Tropical Convergence Zone with the sun brings stormy unsettled weather between December and February. Rainfall tends to start and finish earlier in the south-west than in the north and north-west of the country. The eastern highlands experience the lowest temperatures.

The year can be divided roughly into four seasons:

- cool season : mid-May to August
- hot season : September to mid-November
- rainy season : mid-November to March
- post-rainy season : April to mid-May

The cool season records the lowest temperatures when the sun is well to the north and the subtropical anticyclones move northward. It is fair and mild during the day, while the

nights are rather cold and scattered ground frost occurs in areas with sandy soils and hollows that are sheltered from the wind. Occasionally guti occurs and the month of June is the coolest.

During the hot season relative humidity and pressure are low and temperature variations correspond with altitude. Cold snaps may occur in October, but they are less severe and last for short periods than is the case during the cool season. Thunder activity may start to occur by the end of October.

During the rainy season, gradients are weak and the wind is normally light. The main feature of the season is the Inter Tropical Convergence Zone (ITCZ) which moves southward with the sun bringing with it copious rain over the northern region of the country. The main rains are associated with the ITCZ.

Situation of Environment Statistics

Zimbabwe attended the Rio Conference in Brazil in June 1992 that came up with Agenda 21. Agenda 21 presented a challenge to all nations to ensure that the environment is integrated with economic and social development at all decision-making levels. In Zimbabwe, this led to the formulation of District Environmental Action Plan (DEAP) programme and the introduction of the urban component in selected cities by the International Council for Local Environmental initiatives (ICLEI). ICLEI is now dormant due to lack of funding.

The Ministry of Environment and Tourism, whose Minister is the current Chairperson of the United Nations Committee on Sustainable Development, is leading the process of developing a national environmental policy that will compliment and enhance the Environmental Management Act (EMA), promulgated in March 2003, and other complimentary legislation pertaining to environmental protection and management and sustainable development. It is increasingly recognised that environmental information is an essential component of national development plans calling for the integration of the environment and development in policy formulation.

The Ministry of Environment and Tourism identified more than one hundred environmental indicators that need to be prioritized. There is need for environmental stakeholders to agree on a set of indicators that need continuous monitoring. An attempt to do so was once made when the Ministry of Environment and Tourism led a process, now dormant due to lack of funding, to develop a database, the Zimbabwe Sustainable Indicators Database.

The Central Statistical Office has the mandate to coordinate efforts in Environment Statistics development. In order to provide the statistics, it collaborates with other environmental stakeholders in a number of ways that include participation in inter-ministerial steering committees such as the National Ozone Committee; provision of data for input into publications like State of Environment and Global Outlook reports;

organizing user/producer workshops, conducting user inquiries; and participation in other meetings and seminars.

Within the Central Statistical Office, efforts to collect environment statistics intensified after the 1991 User/Producer workshop that confirmed the need for environmental data and supported the preparation of a booklet on Environmental Statistics that was already in progress. The first booklet on Environment Statistics was produced in 1994.

The 1994 report covered issues that include climate, soil and land use; Population; Human Activities and their impact, Agriculture Forestry; Wildlife; Mining; Transport and Water. In most cases they were tables, figures or maps without text. The subsequent issues were quite comprehensive. About ten chapters are covered in the reports that include climate; human population, settlements and health; soils and land use; agriculture, water resources; mining and industry; wildlife; forestry and protected areas; tourism, transport and the ozone layer.

Every five years the Central Statistical Office conducts User Producer Workshop, at which a paper on Environment Statistics is presented, to dialogue with the users and producers of statistics. CSO conducted its first ever Stakeholder Workshop dedicated to Environment Statistics in April 2005. The workshop was aimed at strengthening cooperation with the producers and users of environmental data; identifying national environmental concerns; streamlining environmental indicators in preparation for the environment statistics publication; categorizing of the indicators as per chosen framework; exploring the possibility of data sharing and raising awareness on environmental issues, among other objectives.

The outcomes of the workshop were perceived to improve the quality of subsequent Environment Statistics issues, promote synergy in the production of environmental data and improve the quality of country data, that exist scattered in various institutions across the country, and that is also supplied to other international organizations like the United Nations Statistics Division through questionnaires. The participants recommended the use of the Driving Force-Pressure-State-Impact-Response framework (DPSIR) in the presentation of environment statistics.

In trying to solicit users of environmental statistics' views on the statistics produced in the country, CSO conducts user inquiries before the next issue of an Environment Statistics Report targeting users and producers of environmental information. The inquiries form the basis of the Environment Statistics publication.

The user inquiries usually contain the following objectives:

- Identify national environmental concerns;
- Identify data gaps relevant to activities and programmes on environmental management;
- Assess awareness of international environmental regulations and conventions;
- Determine sources and availability of existing data; and

- Update the contents of the Environment Statistics Publication

From the analysis of the inquiries, a number of areas requiring further exploration were identified and these include:

- Availing primary data for further analysis;
- Ensuring continuity of monitoring as well as review of variables measured to capture new issues. This would assist in forecasting events like climate changes;
- To provide details on poorly documented areas, and
- Include documentation of approaches of addressing environmental challenges like indigenous knowledge systems.

Environment Statistics Users

From the Environment Statistics user inquiries, the major users of environment statistics are policy makers, planners, scientists, students, international organizations, research institutions, private sector, schools, media, individuals, including farmers. Government ministries and line departments indicated that they need the data to facilitate effective and efficient planning; promote debates on environmental issues such as Convention in Trade of Endangered Species; formulate, monitor and implement environmental policy and legislation; identify and quantify specific environmental categories; and define the linkage between development and the environment.

Research institutions/scientist/international organizations need the data for assessment of environmental impacts and monitor status and progress of environment indicators over time. Individuals, farmers and investors require information for market analysis. Schools need data in writing up their academic projects and the media need it for awareness and publicity.

Some of the data from the Environment Statistics Section is supplied to other sections within the office. Some data are also included in core publication like the Facts and Figures, the Compendium of Statistics and National Health Profile.

CSO also coordinates the provision of environmental data to the United Nations Statistics Division/United Nations Environmental Programme (UNSD/UNEP) through completion of questionnaires. Zimbabwe has been responding to the UNSD questionnaires since 1999 and was also represented at the Workshop held in New York after completion of the 1999 questionnaire.

In mid 2006 CSO convened a workshop to take stakeholders through the questionnaire. Most of the participants said that they were not familiar with the International Standards Industrial Classifications (ISIC) classifications and some indicators. They made some recommendations for consideration by CSO. Some of them are:

1. The time provided to complete the questionnaire is too short.

2. The need for an appraisal workshop two weeks before the deadline.
3. Stakeholders requested for an honorarium since the work is involving.
4. The need for a wider stakeholder involvement.
5. Information on previous data supplied need to be provided to reduce response burden.
6. The need for templates which would be updated by institutions continuously to enable quick supply of data as and when requested.
7. The Central Statistical Office was advised to mobilize funds from development partners like the United Nations agencies to facilitate the completion of the questionnaire.
8. The questionnaire should be customized to suit sub regions, for example Sub Saharan Africa, to reduce irrelevant questions.

Data Sources

With environmental data existing scattered in various institutions through out the country, there is need to strengthen the coordination of the production of the statistics. There are no national surveys conducted by CSO directed towards the collection of environment data in the country, instead some environment issues like water and sanitation coverages, household source of energy and type of dwelling units are included in all socio-economic statistics surveys like Inter-Censal Demographic Surveys, Labour Force Surveys, Income Consumption and Expenditure Surveys and Demographic Health Surveys as well as national population censuses. Data on tourism, trade, production of companies, environmentally related crimes, agriculture, environmentally related diseases and surveys are collected from CSO sister sections.

Most of the data come from specialist organizations like the Meteorological Office and Zimbabwe National Water Authority. Other sources of data are administrative records, monitoring data and remote sensing. Hence, most of the statistics exist scattered in various primary and secondary data producers.

The following are some of the main data sources and their respective indicators:

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	Daily	Routine	Rainfall Stations Reduced due to Agrarian Reform. Need to Conscientise new Farmers on the Importance of Recording
	Temperature	Degree Celsius	Department of Meteorological Services	Daily/Monthly	Routine	
	Pressure	Millibars/Hecto-pascals	Department of Meteorological Services	Continuous	Anemometer	
	Evapotranspiration	Millimetres/Day	Department of Meteorological Services	Daily	Manual	In Remote Areas Temperatures with Pans.
	Solar Radiation	Watts/m ²	Department of Meteorological Services	Continuous	Plotting on Graphs	There is Backlog- done by observation. In automation Process.
	Wind Direction	Metres/Second	Department of Meteorological Services	Hourly	Windvane	
	Wind speed	Kilometers/hour	Department of Meteorological Services	Daily/Monthly	Routine	
	Relative humidity	Percentage	Department of Meteorological	Daily/Monthly	Routine	
	Green house gas emissions	Parts per Million/Billion. Depends on Concentration e.g. Carbon is per Million & Methane per Billion	Local Authorities	5 years	Surveys	Inadequate capacity in assessment of the gases (Equipment & Personnel)
3. Trade	Imports and Exports of Ozone Depleting Substances	Metric Tonnes	CSO Trade Statistics	Continuous	Recorded by Customs Officers at Ports	
	Incidence of droughts, land	Number	Department of Meteorological	Annual	Routine	

	slides & floods					
3. Demographic	Population size and structure	No. of people (Million)	Central Statistical Office (CSO)	yearly	Census/Household Surveys	
	Population growth rate	Percentage	CSO	5 years	Census/Household Surveys	
	Population Density	Persons per sq.km	CSO	yearly	Census/Household Surveys	
	Population Distribution and Migration	Age, location, sex,	CSO	yearly	Census/Household Surveys	
	Population Characteristics	Number of Households by Type of Dwelling Unit/Tenure Status/Sources of Water for Drinking and Cooking/Toilet Facility/Energy for Cooking	CSO	Yearly	Census/Household Surveys	
	Access to Health Services	Percentage	Ministry of Health/CSO	Monthly	Administrative/Surveys	
4. Agriculture and Land Resources	Soil erosion	Tonnes/ha	Environmental Management Agency	Last Done in 1988	Survey	Lack of Expertise and Equipment
	Crop yields	Tonnes/ha	CSO	annual	/surveys	
	Soil types	Soil properties (pH, bulk density, soil aggregate etc.)	Environmental Management Agency and Agriculture Research and Extension Services	adhoc	surveys	
	Number of Irrigation Schemes	Number	CSO	Annually	Surveys	
	Fertiliser Consumption	Tonnes	CSO	annual	Surveys	
	Crop Area	Hectares	CSO	annual	Surveys	
	Change in land cover	Percentage	Department of Forestry	Adhoc	surveys	
	Land utilisation	Percentage	Department of Forestry	Adhoc	surveys	
5. 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	Department of Forestry	Annual	Routine	

		cleared				
	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	
	Forest fires	Number	Environmental Management Agency	Adhoc		
6. Fisheries	Annual catches by fish major species	Tonnes	Department of Natinal Parks and Wildlife	Annual	Routine	
	Fish ponds & Fish farmers	Number	Department of Natinal Parks and Wildlife	Annual	Routine/Su rveys	
	Fishing Vessels , Fishers and Gears	Number	Department of Natinal Parks and Wildlife	Monthly	Adminstrati ve	
7. Water Resources	State of Major Dams	Cubic Metres	Zimbabwe National Water Authority	Daily	Gauge Plates	
	Number of Permits	Number	Zimbabwe National Water Authority	Daily	Administrat ive	
	Water Supply & Consumption	Cubic Metres	Local Authorities	Monthly	Metre Reading	
	Water Flow in selected rivers	Cubic Metres/second	Zimbabwe National Water Authority	daily		
	Run-off in selected rivers	Cubic Metres/sec	Zimbabwe National Water Authority	daily	Automatic recorders	Obsolete equipment / Human resources capacity is depleting
	Siltation of water bodies	Mega litres/ cubic metres	Zimbabwe National Water Authority	10 years	Hydrograph ic Method	Procedure very slow Because of type of equipment
	State of BOD in water bodies	Milligram/litre	Zimbabwe National Water Authority	monthly	Laboratory analysis	Transport Problem and repair of lab equipment
	Concentration of nitrates in water bodies	Milligram/litre	Zimbabwe National Water Authority	monthly	Laboratory analysis	
	Concentration of suspended solids in water bodies	Milligram/litre	Zimbabwe National Water Authority	monthly	Laboratory analysis	
	Number of dams/Reservoirs	Number	Zimbabwe National Water	On going	Administrat ive	

	/Weirs		Authority			
	Rural ground water supply schemes	Number	Ministry of Irrigation & Resources /Water Boards	Annual	Routine	
	Access to piped water	% of Households	CSO	Annual	Surveys	
	Number of boreholes	Number	Ministry of Health and Child Welfare	Monthly	Routine	
8. Biological Diversity	Species of fauna (mammals, amphibians, reptiles, birds, fish, invertebrates, domesticated) and flora	Number	Department of National Parks & Wildlife	Annual	Surveys	
	Population of wild animals in Game Reserves & National Parks	Number	Department of National Parks & Wildlife	Annual	Routine	
	Number of Poachers and Crimes Committed	Number	Department of National Parks & Wildlife/CSO	Monthly	Recording	
	Endangered wildlife fauna and flora Species	Number	Department of National Parks & Wildlife	Annual	Survey	
	Number of Protected areas	Number	Department of National Parks & Wildlife			
	Wetlands of International Importance	Number	Environmental Management Agency	Routine		
9. Industry, Energy & Mining	Registered Enterprises	Number	Ministry of Trade and Industry/CSO	Monthly	Routine	
	Employment by Industry	Percentage	CSO	Quarterly	Survey	
	Companies certified by ISO 14001 management system	Number	Standards Association of Zimbabwe	Monthly	Administrative	
	Mineral Production and Exportation/Importation	Tonnes	CSO	Monthly	Administrative	
	Number of mining licenses granted	Number	Ministry of Mines	Monthly	Administrative	
	Number of mining accidents	Number	National Social Security Authority	Monthly	Administrative	
	Arriving Visitors	Number	CSO	Quarterly	Administrative	Travellers do

	by Purpose				ive	not fill Exit Cards
	Arriving Visitors By Country of Last Permanent Residence	Number	CSO	Quarterly	Administrative	
	Arriving Visitors by Mode of Travel and Port of Entry	Number	CSO	Quarterly	Administrative	
	Travel Expenditure	Number	CSO	Quarterly	Administrative	
10. Environmental Management Framework	Number of Environmental Policies, Laws and Projects/Programmes	Number	Ministry Of Environment and Tourism	Adhoc	Research and Meetings/Workshops	
	Number of Environmental Related Diseases	Number	Ministry of Health and Child Welfare/CSO	Continuous	Administrative	
11. Transport	Road inventory and State of Roads in Zimbabwe	Number and KM	Ministry of Transport and Energy	Adhoc	Administrative	
	National Vehicle Population by Class	Number	CSO	Annual	Administrative	
12. Waste	Solid and liquid waste generated	Number of bins and Litres	Local Authorities	Monthly	Collections	Frequency vary due to resource limitations

Dissemination of Statistics

CSO produces the Environment Statistics publication after every three years incorporating recommendation of the previous user inquiries. One of its strongest dissemination tool is the Zimbabwe Statistical Database (ZIMDAT) which is a national database that contains most statistics of the country. The database is continuously updated and the data are disseminated through presentations and CDs annually.

As indicated earlier on the data are also disseminated through other national publications like State of Environment Reporting, that uses the pressure state response framework, and global reports like the Global Outlook reports. Data are also disseminated through pamphlets, for example at the Agricultural Shows and Zimbabwe International Trade Fares (ZITF). Most data are supplied to international organizations through completion of questionnaires that include the UNSD/UNEP biennial questionnaire.

Challenges of Statistics Production

While a lot of relevant information resides with a number of institutions, there is very little information sharing that takes place between stakeholders for a number of reasons such as, inter-alia, inadequate information and communication technologies (ICT) infrastructure and inadequate capacity to use information. Most of environmental data usually lack continuity and the data sets are incomplete. This is linked to a variety of challenges that include the use of obsolete recording/measuring equipment or its unavailability, high staff turnover resulting in skill gaps and lack of funding. Resources like transport, manpower and ICT to gather the scattered data are not easily mobilised. Further calculations that need to be done using data from different institutions are usually not done and this calls for a more coherent national data collection system.

Given that the data are collected independent of each other, the data sometimes conflict mainly due to differences in methodologies used. This poses a great challenge when disseminating the data. Some institutions like local authorities adopted computers recently and the hardware is still insufficient, most of their data exist unprocessed and in form of hard copies. To establish time series there is need to enter all the data in computers and process it.

Environment Statistics in CSO are relatively new when compared to other conventional statistics like National Accounts and Censuses. Resources, both human and hardware, allocated to environment statistics are few. There is only one officer assigned to compile the statistics on a full time basis even though the officer can request assistance of support staff when need arises. Likewise the compilation of the statistics by primary and secondary data producers, in most cases, is not regarded a priority. Hence they can afford to operate without a person responsible for compilation of the statistics for a while.

Future Plans

The Central Statistical Office is in the process of being transformed into a semi-autonomous agency. The new Act will allow the creation of a National Statistical System (NSS) that is foreseen to bring mechanisms for better co-ordination and organization in the production of all statistics. During the transitional phase capacity is expected to be build and also enhancement of public participation and access to information. The environment statistics programme is expected to be boosted through an increase in human personnel, hardware and software, and adoption of the Driving Force-Pressure-State-Impact-Response framework (DPSIR) framework in the dissemination process. The NSS is hoped to ensure a systematic and coordination of the production and dissemination of environment statistics.

At section level the programme of action includes effective collection of urban environmental indicators data, the application of the Driving Force-Pressure-State-Impact-Response framework (DPSIR) in presentation of data continue conducting user inquiries that adds relevance to the Environment Statistics issue.

