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An Insight into Environmental Statistics Production- Experience from Botswana

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INTRODUCTION

Botswana through the Central Statistics Office has been collecting and compiling statistics on the environment and natural resources since 1995. The Office uses the Framework for Development of Environment Statistics (FDES) developed by the United Nations Statistics Division (UNSD) to guide the collection and compilation of environment statistics. The lesson learnt during this process is that environment statistics is multi sourced and interdisciplinary therefore it is a challenging and interesting field.

Some of the publications the Office has so far produced include the following; Environment Statistics Reports for 2000 and 2006, Wildlife Statistics Report for 2004, Energy Statistics reports for 2002 and 2004, Water Statistics Report for 2008 and Natural Disaster Digest for 2008. The Office is in the process of producing Climate Change Statistics Report for 2009, Wildlife report for 2008 and water report for 2009.

This short paper outlines the experience of Central Statistics Office in Botswana in producing the environmental statistics. Although the framework has its own weaknesses, it is found to be easy to follow and helps organise the data more logically. It also gives direction on where and how to start the production of the statistics for the first time or when you are at early stages of development of the statistics.

DATA ACQUISITION

The first step in the acquisition of environment data in Botswana is through identification of statistical topics and variables to compile statistics on. In this instance the FDES has been key in guiding on what variables one can collect by outlining the information categories and environmental components. In selecting

the statistical topics and variables, we are informed by the relevance and the relative importance of the variable in the country as well as the availability of data.

The FDES organises the information categories in the following sequence: a) social and economic activities and natural events; b) impacts on the environment; c) responses to the impacts and d) stocks, inventories and background conditions. But for our purposes, we decided to start with the stocks and inventories because it gives an indication of how much of a particular resource we have even before we talk about its exploitation, after that we follow the FDES format as it is. Putting the statistical topics in this format of information categories and environmental components gives lot of coherence to environmental information. That is the strength found in FDES.

The challenge however has always been how to handle human settlements as a component and very often we treat it interchangeably as a component and as a social and economic activity. This is because human settlements can put pressure on the environment media of air, water and land, at the same time it can be impacted by economic development activities and natural events.

In using the FDES it was also found that it is difficult to relate the information categories of the framework with each other. For instance you cannot relate a particular pressure to a specific impact; unless more scientific data analysis methods are employed. As a result we tend to rely much on the available literature to qualify some of the relationships. For instance, literature suggests that emissions of greenhouse gases have an influence in the exacerbation of climate change. But it is difficult to relate the emissions of greenhouse gases to temperature.

Data acquisition process is progressed through submission of data requests to potential data suppliers. At the moment there are no Memoranda of Understanding signed between the Central Statistics Office and the stakeholders. Hopefully this will be addressed through the intended implementation of the National Strategy for Development of Statistics by the department once it is designed. However this lack of formal partnership has been a major setback as data is not submitted in a timely manner therefore affecting the timeliness in the production of environment statistics. Data is further delayed by the fact that most of the data collection is manual. In addition, some of the data exist as hard copies on files such that it is time consuming to locate the files and transcribe data into digital format. However progress has been made with some data such as meteorological and water data for towns and major villages because they are relatively readily available.

Environment data is collected mainly from administrative records of various organisations. At present, we do not collect primary data even though there are many gaps that could be filled through specific surveys. The major impediment is limited technical expertise to conduct such surveys. What is lacking in the FDES is the methodology for collecting some of the data that is not available. An example in this regard is the collection and compilation of data on fuel wood availability, its consumption as well as production and the impact of harvesting fuel wood on the environment. We will note that this energy source is the most common in rural Botswana, so its use is quite extensive but the exploitation is not monitored and there is no baseline data.

DATA PROCESSING

After data is received it undergoes processing. This entails integration of data since it is collected from different sources; it also involves storage of the data. Moreover, it involves analysis of results using spreadsheet or a statistical package. Data is received in various formats since it is collected from various sources each

with their own software; some even come as hard copies. Data is then converted to Excel Spreadsheet and/or SPSS for tabulation and analysis. In this regard, FDES is limited in that it does not recommend software that is most suitable for integrating such heterogeneous data. Perhaps what we need is an integrative computer software/programme which may also facilitate environmental modelling.

In addition the non homogeneous nature of data sources presents a challenge because of differing data classifications. This makes integration of data impossible. Different organisations have their own nomenclatures which do not necessarily correspond with each other. For instance data acquired from a land authority does not use the same classification (spatial and temporal) as water authority. Even within the same sector like water, three distinct bodies have been responsible for management of the resource; one was responsible for drinking water in towns, the other in major villages and the third one responsible for small settlements. Each one of these water organisations had their own categorisation scheme. Reporting periods also differ between sources. We need to improve on the harmonisation of such. It is anticipated that things will improve as the delivery of water in Botswana is now being placed under one authority.

Environmental statistics is interlinked with environmental accounting. However the relationship between FDES and the System for Environmental and Economic Accounting is not very strong. Statistics compiled under FDES is not sufficient to be used in the compilation of the accounts because more detailed data is needed for the latter. The FDES is also not linked to economic statistics; this limits the incorporation of environmental issues into socio-economic planning. It could be useful to have an international standard classification of environment that may be linked to the International Standard Classification of Industries so they environmental issues can be easily incorporated in to macroeconomic planning models.

Another challenge that we encountered when compiling the data is how to handle data gaps that arise due to data unavailability. For instance is it appropriate to project for the missing data by means of averages or not. This hampers time series analysis of data.

These challenges notwithstanding Botswana has been consistently collecting and compiling environmental statistics over the years guided by the FDES. The wish is to improve on these processes so as to enhance data quality.

CONCLUSION

It is therefore concluded that FDES is a very useful tool to collect and manipulate environment data. It brings coherence and relevance to environmental information. Very importantly, it gives a statistician direction on how and where to start environment data collection and compilation.

There are however some challenges that need to be addressed in order to improve on the use of the framework. These include suggesting a standard software/programme for data integration; giving a more pronounced linkage with economic statistics and environmental accounts; and provision of methodological and analytical guidance. It is our hope that some of these issues will be deliberated on during this meeting (EGM November 2010).