Statistics for National Development[1]

Sani I. Doguwa[2]

Good statistics that has been collected according to agreed good practices are crucial as a tool for development. Gross domestic product (GDP) and other measures of economic activity such as Gross National Income (GNI) together with their individual components, show how the economy is responding to government policy and other influences. The balance of payments can demonstrate the requirement for policy adjustments and is also one of the indicators scrutinised by potential foreign investors in the country. Agricultural statistics clearly have implications for longer-term planning, particularly if they show a move away from the land into urban areas or a change in traditional farming methods. Population statistics often indicate the need for government intervention – for example, if the population is expanding so rapidly that there are major policy implications in the fields of education, housing, etc. Health-care statistics might indicate the need for a change of policy in the provision of medical services or the preponderance of particular diseases. Growth in Monetary aggregates might indicate the stance or anticipated direction of monetary policy.

1. Introduction

Official statistics, that is, statistical data collected and disseminated by governments about different aspects of life in a country, are needed for a number of important purposes. They provide the information, the evidence, needed for the business of government – both day to day administrations as well as for policy analysis. At the same time, statistics are also important for users outside government. They provide information needed for business decision making and also help to keep individual citizens informed about what their government is doing. In a world where national economies are becoming increasingly inter-dependent, official statistics collected, compiled and disseminated by the National Bureau of Statistics (NBS) in the case of Nigeria, provide a basis for understanding how Nigeria interacts with others and how conditions compare with those elsewhere.

Until 1959, the banking industry in Nigeria was largely unregulated. There were, therefore, no reliable and organized data on the monetary and financial sub-sector. However, the phenomenal growth in the number of financial institutions and financial instruments in Nigeria subsequently led to the greater use of monetary policy for economic stabilization. Consequently, the need to monitor the events in the monetary and financial sector calls for more timely, accurate and reliable data. This involves the collection, compilation and dissemination of balance of payments, monetary and banking statistics on the Nigerian economy by the Central Bank of Nigeria (CBN).
Good statistics that has been collected according to agreed good practices - using appropriate methods for data collection, processing and dissemination, are crucial as a tool for development. They provide an objective and replicable picture of the state of a country; enable comparisons, both over time and space; and set benchmarks for measuring progress in the future. The use of well-established data processes provides data and statistics that can be analyzed using the powerful tools of statistics and econometrics.

Every country needs good statistics, therefore, almost all countries have established specialized agencies (such as NBS and CBN in the case of Nigeria) whose job is to collect, process and disseminate good statistics. The problem is that in many countries, especially those in some developing world, the work of these agencies is under-appreciated and under-valued. Many statistical systems are caught in a vicious cycle of under-funding which ultimately leads to under-performance.

Official statistics are public goods. The use of them by one person or agency does not detract from their use by another. While they are often costly to produce, they are readily disseminated and once they are publicly available, it is difficult to exclude other users. The value of statistics depends upon their quality. However, since it is not easy to ascertain the quality of statistics directly, users must have confidence in the producer and in the processes (methods and standards) employed in the production of the statistics. For all these reasons, it is difficult to establish functioning markets for statistics. This leaves national governments, institutions and international agencies to produce and disseminate statistical information.

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[2] Statistics Department, Central Bank of Nigeria

Governments have a duty, therefore, to compile and publish official statistics. The kinds of statistics that are collected and disseminated will depend on needs and have to be determined in consultation with users and providers. With many other competing uses of government revenue in developing countries, not all statistics that are needed can be provided. As a result, vary difficult decisions have to be made on priorities. It is the job of statisticians to make the case for adequate resources to provide the most important sets of statistics. At the same time, though they have to demonstrate that they are using the scarce resources provided as efficiently and effectively as possible and the data that are being collected are of use and value. They also have a duty to ensure that the data they provide are of good quality and that users are able to have confidence in the accuracy, reliability and integrity in the data.

The rest of the paper is structured as follows. Section two discusses the development and maintenance of a good statistical system. The uses of statistics for national development are discussed in section three, while section four summarizes and concludes the paper.

2. Developing and Maintaining a Good Statistical System

2.1 Historical Background

The 19th century British Prime Minister Benjamin Disraeli observed that there are three kinds of lies: - *lies, damned lies* and *statistics*. His observation, while not calculated to displease statisticians, was an early indication of the political importance of statistics. Collection of facts and figures by government about its citizens is as old as the most ancient of civilizations. The Romans did it and there is evidence of local censuses in ancient Babylon and Egypt. A complete count of citizens was planned in China in AD 1370. The Domesday Book was an exhaustive and defining survey of England conducted by its Norman conquerors in the 11th century. However, such early population counts were very limited, the two main purposes being information for conscription and taxation.
The word 'statistics' derives from the Latin 'status' or political state and the German 'statistik' – facts and figures for use of the state. Despite their earlier beginnings, statistics didn't become properly organized until the scientific revolution in Europe in the 17th century and the growth of European nationalism. Every nation then determined to gather as many facts as possible about its population, trade, finances, taxes and armed forces. But it wasn't until the 20th century that official collection of statistics developed into the exhaustive process we see today, with data available on nearly every aspect of people's lives and on country's activities. Official statistical systems in developed countries collect and disseminate a very wide range of data about individual nations. Increasingly, as is happening in the European Union[3], for example, consistent and comparable statistics are being collected at the regional level.

2.2 Production and Dissemination of Good Statistics

The Statistics Act, 2007 (Act No. 9 of 2007) established for Nigeria a "National Statistical System" (NSS) with objectives to: raise public awareness about the importance of statistics; collect, process, analyze and disseminate quality data; promote the use of statistics; and build capacity for the production and use of data. Achievement of these objectives could institute a culture of conscious use of statistical data by both the public and private sectors for planning and decision processes.

The Act has in addition established a national statistics office, the "National Bureau of Statistics" (NBS) which plays the role of coordinator of the NSS with powers to collect, request and be provided with data throughout the country on a wide range of matters. The Statistician-General is responsible to the Presidency and is therefore politically in a position to influence decisions of government. In addition, the Act has provisions that ensure professional development. For instance, there is professional requirements for appointment to the Board of NBS, MDAs are to established statistics units with staff to be appointed by the NBS, the NBS employee service scheme is aligned with educational/research institutions in the country, and there is provision for a "National Consultative Committee on Statistics" (NCCS) that examines statistical programmes and develop statistics strategies for the country.

[3] See Eurostat website - http://www.europa.eu.int/comm./eurostat/

In addition to other powers granted the CBN under the Act No. 7 of 2007 (The Central Bank of Nigeria Act, 2007), it has powers to collect and share information relating to or touching or concerning matters affecting the economy of Nigeria. The CBN has therefore been provided with the essential legal instrument to play its role in the NSS. To this end, the Bank established its Statistics Department with the mandate to "collect, analyze and manage data on all sectors of the economy, in order to provide statistical support to the Bank, the government, international organizations and other stakeholders".

Fellegi (1975) noted that:

> *"The objective of a national statistical system is to provide relevant, comprehensive, accurate and objective statistical information. Generally, statistics are invaluable for monitoring the country's economic and social conditions, the planning and evaluation of government and private sector programmes and investment, policy debates and advocacy, and the creation and maintenance of an informed public."*

It is, therefore, useful here to emphasise some key points on how to produce and disseminate good statistics:

a) International standards should be adhered to in collecting and processing data, in order to facilitate comparison and analysis between countries and over time.
b) Those in charge of official statistics must enjoy some degree of autonomy from government in producing and disseminating data.
c) Data dissemination must be undertaken in a way that is credible both inside the country and internationally.

The Statistics Department of the CBN has recognized these key points as encapsulated in its mission statement – to provide comprehensive, timely, accurate and reliable data for policy design, analysis and evaluation through the use of *standard statistical procedures*.

At its special session of 11-15 April, 1994, the United Nations[4] have developed some fundamental principles of official statistics that were adopted unanimously by the United Nations Statistical Commission. The International Monetary Fund (IMF) has also been concerned with the quality and reliability of official statistics. The IMF's *Dissemination Standards Bulletin Board*[5] provides access to three sites:

a) The Special Data Dissemination Standard Site (SDDS) guides countries that have or might seek access to capital markets.
b) The General Data Dissemination System Site (GDDS) guides countries in public provision of timely, accessible and reliable economic, financial and demographic data.
c) The Data Quality Reference Site (DQRS) has been created to foster common understanding of data quality.

2.3 Censuses, Surveys and Administrative Data

In ancient times, collection of official statistics was little more than a simple head count. Today it is a process of considerable sophistication. The quality of the published statistics depends entirely on the ways in which the source data were collected in the first place. In developing countries especially, a key data source is the national population census, conducted in most countries once every 10 years. Generally the population census is the only complete count of the whole population ever carried out. Census data, therefore, provide a valuable source of statistical information about the current state of a country and its people. By comparing one set of results with another, significant long-term changes in the population and in key aspects of national life can be monitored. In the United Kingdom[6], for example, apart from the war year 1941, a census has been taken in Britain every 10 years since 1801, enabling comparisons over two centuries.

Full counts of the whole population, however, are both expensive and very disruptive and consequently are only held at fairly infrequent intervals. Instead, almost all statistical systems make use of statistical theory to select samples so as to be representative of the population they are selected from. Sampling theory provides the basis for selecting samples, for generating estimates of important statistics for the whole population and even for providing measures of the reliability of these estimates.

Sample surveys, therefore, of many different populations such as households, businesses, farms, or areas of the country are a key data source in most countries. In many countries, regular and continuous surveys are a key source

[4] See United Nations website – http://www.unstats.un.org/unsd/goodprac/bpabout.asp
[5] See IMF website - http://www.dsbb.imf.org
[6] See the United Kingdom website - http://www.statistics.gov.uk/census2001/census_news.asp.

of statistics essential for monitoring social and economic trends. They may monitor such things as the size and structure of the labour force and the activities of households including: spending patterns, family structure, housing conditions, education, health and so on. In developing countries household surveys are a key source of data to monitor welfare indicators such as those required for poverty reduction strategies and for monitoring progress towards the Millennium Development Goals.

Data derived from or collected as an adjunct to administrative processes are also a major source of official statistics. Depending on the sophistication of government, there are potentially many such sources of statistical data including population registers, tax records the documentation needed for international trade and school enrolment. In some developed societies, for example the Scandinavian countries, these sources provide the majority of official statistics. In developing countries, however, rather less use is made of administrative data, in part because of limitations of coverage, but also because of bureaucratic problems.

2.4 Producer User Relationships

The successful collection of official statistics is often described as a *circular process*, in which government (producer), those who supply data to government (respondents), those who use or benefit from the statistics (users - enterprises and citizens), and the media are all interlinked and interdependent.
The government (the official statisticians) depend on the goodwill of respondents for an adequate and efficient supply of data, even if the respondents are sometimes obliged to cooperate by statute. One way in which such goodwill can be fostered is by making the statistics compiled as a result of such cooperation available in a user-friendly way to respondents, as well as the public in general.

Official statistics are collected on behalf of the public and at its expense, using income from taxation. They provide an indication of the state of the nation, both good and bad. Access to statistical information is a source of political power. To some extent, therefore politicians may wish to "control" the flow of information or perhaps manipulate the data to show their efforts in a more favourable light. But good governance requires that official statistics are made readily available to all citizens, even if some statistics may indicate poor performance.

Ease of access to official statistics is a hallmark of an open and democratic society. Politicians need to be persuaded that providing reliable statistical data that is trusted by the user has long-run benefits in helping to promote economic growth and reduce poverty. Conversely, countries where official statistics are tightly controlled and are subject to political manipulation may well find it more difficult to attract investment and develop markets.

To complete the circle, it follows that the news media play a critical role in the process. They are a key channel through which government informs the public on statistical matters; and they act as a *watchdog* in case of any attempt by government to manipulate official statistics. The best national statistical offices put a high priority on their relationship with the media.

2.5 Role of Technology

Official statisticians manage data collection exercises, process the data to identify and remove errors and to calculate different indicators and statistics, and then disseminate the results. Typically, even in small countries they deal with very large data sets, containing thousands and even millions of records. In the past, data processing and dissemination used to be painstaking operations requiring large teams of people. Often, results didn't appear for three, four or even five years after the actual data collection. The results that were eventually published were quite limited, special tables to obtain specific information, for example, how many people of a certain age group lived in a particular province, might take months of work. By that time, the data are out-of-date and no longer useful for decision-making and other purposes.

Information and computing technology (ICT) has changed all this, even in poor developing countries. The cost of computing power has now come down so low that it is within reach of even the smallest statistical agency. Some of the changes and opportunities that ICT has made possible include:

a) The possibility of manipulating very large data sets involving millions of figures has offered statisticians the opportunity to study micro data corresponding to very small areas, such as a city block or a rural settlement with a handful of inhabitants.

b) Such micro data can be easily assembled to study whole new geographical entities – areas of poverty, zones of industrial development, suburban sprawls in great metropolitan areas etc.
c) Thanks to new data-warehousing techniques, this process can be completed in seconds: the data are always available, even on the Internet, for compilation in tables that meet exactly the needs of the user.
d) Geographical Information Systems (GIS) have been described by UN as a computer-based tool for the input, storage, management, retrieval, update analysis and output information. The information in a GIS relates to data characteristics that are geographically referenced. GIS allows statisticians to answer questions about *where* things are or about *what* is at a given locations (Handbook on Geographic Information System and Digital Mapping by the United Nations, N.Y., 2000).
e) The Internet provides whole new opportunities in disseminating information and substantially reduces the cost of publishing data. Data can be made accessible to users without having to incur the costs of publishing large and expensive printed reports. Database management programs allow users to access data in new ways, making links between data sets that were not possible previously.

2.6 Cost and benefits of updating the statistical system

A country under development undergoes rapid change. Statistics quickly become dated, as processes such as globalisation and the use of ICT rapidly modify the picture they once portrayed. For such countries, developing a statistical system can't be simply a 'one-off' exercise. It might be possible to obtain help in developing the system and in building capacity, but then a country probably must rely on its own resources to maintain it. Even when resources are scarce, investment in good statistics must be a priority.

Because needs for statistics change, as countries develop and as users become more experienced in analysis and use of data, statistical systems need to ensure that they are continually monitoring needs and adapting their operations to reflect changing demand. But some statistical processes such as large-scale surveys and censuses are complex exercises that require considerable time to plan and execute properly. It may take two years or more to plan and carry out a new large-scale household survey, for example; a population census can take even longer. An effective and efficient statistical system, therefore, is not only one that meets current needs, but which actively anticipates future needs.

The managers of official statistical systems, therefore, need to be forward looking and to be continually arguing for an appropriate allocation of financial and other resources. At the same time they need to ensure that the infrastructure that supports statistical operations is also adequate and is being upgrade as resources permit. Such infrastructure includes physical facilities such as buildings, vehicles, computers and communications equipment as well as the building blocks of effective statistical operations, such as a business register, maps and sampling frames.

3. Using statistics for National Development

3.1 Data for Managing Government

Governments need statistics to run a country efficiently, both for day-to-day administration and for policy making in the longer term. They need statistics to manage the economy, to 'balance the books' – maintaining a balance between revenue and expenditure and ensuring macro-economic stability. Statistical data also have a crucial role to play in resource allocation, in deciding where scarce resources can best be targeted so as to achieve agreed goals and targets.

While governments finance official statistical agencies to generate the data needed for the business of government, it is now widely accepted that these agencies also have a duty to provide information to others outside government to support decision making generally. Because official statistics are public goods, it is usually not possible for the private sector to provide the wide range of data needed by businesses and individuals. Statistics can be a powerful instrument in building a national consensus on a whole range of actions – and, as such, are a cornerstone of the democratic process.

Governments also have international responsibilities through their membership and participation in both regional and international arrangements. The provision of accurate and up to date statistical information is often an

important part of this. Good statistics enable a country to fulfil its international responsibilities and send a positive message to the rest of the world.

3.2 Data for Managing the Economy

One of the most important tasks all governments have is to manage the domestic economy and its interactions with the rest of the world. The actions governments take vary from country to country, but include maintaining an appropriate balance between supply and demand in the domestic economy and externally and creating the right environment for investment, economic growth and poverty reduction. The economic statistics that official statisticians collect are crucial for this process.

Growth and prosperity depend to a large extent on controlling the rate of inflation, i.e. the rate at which the retail prices of goods and services are changing (increasing or decreasing). The retail (or consumer) price index is among the most high profile and keenly anticipated statistics issued by governments, usually on a monthly or quarterly basis. One reason is that it affects nearly everyone and most people have some understanding of it – because it indicates the value of their money. Inflation is closely linked to government policy – for example, to interest rates set by the central bank – and its accurate measurement is considered a key criterion of short-term economic management.

Similarly, labour market statistics – levels of employment and unemployment and earnings – are a key short-term indicator of economic health and whether or not the government needs to make adjustments in economic policy. In developed countries these are collected and published monthly. In the developing world the data are no less important, but are more complicated to collect because many people work in what is known as the informal sector where statistics are not so readily available.

Balance of payment statistics, while not so readily understood by the man or woman in the street, are closely monitored by the government and the business world because of the economic penalties that can swiftly accrue from trade and other imbalances. Again, these are usually compiled monthly.
Statistics on industrial output are also a pointer to possible imbalances in the economy - whether or not a particular sector (for example, manufacturing industry or agriculture) is in decline and might need to be the target for government intervention.

3.3 Data for Longer-term Policy-Making

Gross domestic product (GDP) and other measures of economic activity such as Gross National Income (GNI) are key indicators for governments. Together with their individual components, they show how the economy is responding to government policy and other influences. GDP per person is a readily-understood indicator of the nation's economic well-being and one often used when comparing one country with another. The balance of payments can demonstrate the requirement for policy adjustments and is also one of the indicators scrutinised by potential foreign investors in the country.

Agricultural statistics clearly have implications for longer-term planning – particularly if they show a move away from the land into urban areas or a change in traditional farming methods. Population statistics often indicate the need for government intervention – for example, if the population is expanding so rapidly that there are major policy implications in the fields of education, housing, healthcare etc. Health-care statistics might indicate the need for a change of policy in the provision of medical services or the preponderance of particular diseases.

Money and Banking statistics are very important for the purposes of formulating monetary policy and monitoring its implementation. The major users of money and banking statistics in Nigeria are the policy makers of the CBN, Federal Ministry of Finance, National Planning Commission, the Presidency, the financial sub-sector (banks and other non-bank financial institutions), research institutes, private researchers and universities.

A major function of the CBN is the overall supervision of Nigeria's financial system. Based on the statutory returns the banks and other non-bank financial institutions render to the Bank on periodic basis, financial statistics are compiled and used to monitor compliance with policy targets. Also in the early 1990s when the banks experienced varying degrees of distress, Doguwa (1999) noted that the CBN refocused its attention on efforts to

identify problem banks and to predict failures with sufficient lead time for remedial actions to be instituted to save the banks from deteriorating further.

There are many other examples: tourism statistics might be a key indicator, especially in a developing economy; transport statistics could be vital for infrastructure planning; crime statistics might suggest problems of criminality that demand positive policy intervention; environmental statistics could highlight looming problems of pollution, especially when industry is expanding rapidly.

3.4 Statistics for Business Growth

It would be a foolish person who started a new business 'blind', without any knowledge of the general economic climate or the particular circumstances of the market sector he or she had entered. Here again, official statistics are an invaluable ally. Economic and financial statistics give the background to a country's economic health. Import/export data will offer clues on the international dimension of your chosen market sector. Figures on household consumption and spending patters might indicate levels of demand for goods and services, while those on retail or consumer prices (inflation) and retail sales ('factory gate' prices) will also yield useful business intelligence. Statistics on bankruptcies and company liquidations can also provide useful and cautionary note background information. At a more specialised level, there might be data that focus on particular sectors of the economy, or particular groups of consumers.

The retail or consumer price index (RPI/CPI) is also of great significance for government and business. Business contracts can often contain clauses stipulating that agreed payments are subject to rises in line with the RPI or CPI. Businesses operating in a climate of high inflation could invite ruin if they did not take such a precaution in drawing up contracts. Governments often have 'contracts' with their citizens based on the RPI/CPI – for example, the level of state benefits or pensions might rise in line with inflation.

3.5 Using data to Improve People's Lives

In addition to managing the economy, official statistics are also needed to monitor the welfare, or well-being, of people. All governments have a concern on the status of their citizen's health, education and other areas of welfare. All countries have signed up to the United Nations' Millennium Declaration that requires actions to improve welfare and sets out specific indicators to be tracked between now and 2015. At the same time, many governments have developed specific poverty reduction strategies that also set out targets for improvements in welfare and identify specific indicators to be measured on a regular basis.

Some indicators of well-being focus such as infant mortality and life expectancy at birth are concerned with survival and life experiences. Others focus on specific aspects of welfare such as health or education. Increasingly countries are accepting that they have an obligation not only to monitor welfare, but also to provide regular reports on progress and the information needed to monitor what is happening regionally and at the global level.

The World Health Organization[7] is probably the most important international organization which directs and coordinates authority on international health work that strives to bring the highest level of health to all peoples. The UNESCO[8] Institute of Statistics (UIS) carries out similar tasks on education statistics.

3.6 Statistics to Attract Foreign Investment

Statistics are a crucial guide for firms considering investment in other countries, and for international organisations providing development assistance. The IMF's General Data Dissemination System Site was established in 1997 to provide a framework for evaluating needs for data improvement and setting priorities in this respect; and to guide member countries in the dissemination to the public of comprehensive, timely, accessible, and reliable economic, financial, and socio-demographic statistics. The website provides information on data produced and disseminated by member countries that participate in the GDDS[9].

[7] See WHO website – http://www.who.int
[8] See UNESCO website – http:// www.uis.unesco.org/
[9] See IMF website for GDDS - http://dsbb.imf.org/Applications/web/gddshome/

Data are essential for world financial operations. International organisations, financial institutions and banks rely on statistics to evaluate their investments. But statistics can be unreliable, prone to different interpretations or too dated to be useful. Or they could be reliable but unusable if international investors do not trust them. To avoid such risks and with a view to becoming players on the global financial stage, by the end of 2000, 47 countries had agreed to submit their statistical systems to the rules of the IMF's Special Data Dissemination Standard. A list of the data the IMF maintains (and that are considered particularly important for investors) is provided. The website provides information about economic and financial data disseminated by member countries that subscribe to the SDDS[10].

4. Summary and Conclusion

The word "Statistics" has different meaning to people of diverse backgrounds and interest. Some people view statistics as a field of hocus-pocus whereby a person in the known overwhelms the amateur. To other people it is a way of collecting and displaying large amounts of numerical information. And still to another group it is a way of making decision in the face of uncertainty. Generally speaking, Statistics is concerned with collecting, collating, summarizing, presenting and analyzing data as well as drawing valid conclusions and making reasonable decisions on the basis of this analysis. Careful use of standard statistical methods enables us to accurately describe the finding of a scientific or socio-economic research.

Statistics is use in almost all areas of the physical and social sciences. The professional fields of engineering, education and business all employ statistics in setting standard, establishing policies and planning. The Civil Engineer can use statistics to determine the properties of various materials, the school superintendent may use statistics to mould curriculum, and the Business manager may employ statistics to forecast sales, design products and produce goods more efficiently. The role of statistics in the social sciences, especially in psychology, sociology and economics is a critical one. Here the behavior of individuals and organizations often must be monitored through numerical data to lend credence to models and theories that cannot be supported by theoretical arguments alone.

Despite the need of statistics as public goods for national development, it is difficult to establish functioning markets in statistics. This leaves national governments, institutions and international agencies to produce and disseminate statistical information. These national governments, institutions and international organizations have a duty, therefore, to compile and publish balance of payments, monetary, banking, other financial and official statistics by providing adequate funds and other support to their Statistical Agencies.

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[10] See IMF website for SDDS - http://dsbb.imf.org/Applications/web/sddshome/