Chapter 1
AGRICULTURAL STATISTICS

1. Introduction

Nigerian agriculture is characterised by considerable regional and crop diversity. Analysis of this sector, particularly the food sub-sector, is fraught with serious data problems. However, the available statistics provide a broad overview of development in agriculture upon which we can make some broad generalisations about its role in economic development and structural change in Nigeria.

In the 1960s, the agricultural sector was the most important in terms of contributions to domestic production, employment and foreign exchange earnings. The situation remained almost the same three decades later with the exception that it is no longer the principal foreign exchange earner, a role now being played by oil.

The sector remained stagnant during the oil boom decade of the 1970s, and this accounted largely for the declining share of its contributions. The trend in the share of agriculture in the GDP shows a substantial variation and long-term decline from 60% in the early 1960s through 48.8% in the 1970s and 22.2% in the 1980s. Unstable and often inappropriate economic policies (of pricing, trade and exchange rate), the relative neglect of the sector and the negative impact of oil boom were also important factors responsible for the decline in its contributions.

On its diversity, Nigerian agriculture features tree and food crops, forestry, livestock and fisheries. In 1993 at 1984 constant factor cost, crops (the major source of food) accounted for about 30% of the Gross Domestic Products (GDP), livestock about 5%, forestry and wildlife about 1.3% and fisheries accounted 1.2%.

In most of the surveys and censuses conducted by the National Bureau of Statistics (NBS), which is the major producer of agricultural statistics in Nigeria, crops and livestock are always considered together because of the tendency for most of the farmers to practise crops and livestock husbandry simultaneously. A separate discussion of livestock will involve duplication of some aspects of the survey and censuses designed for collecting crops statistics.

2. Coverage, Scope, Uses and Users of Agricultural Statistics
Coverage and Scope
[a] *Crops and Livestock Statistics*

Crops and Livestock Statistics include statistical information on all the primary activities in this sub-sector as they are carried out on farms belonging to households or corporate bodies. In terms of spatial coverage, these statistics usually refer to individual farms in ecological zones and other convenient administrative or socio-economic entities (division, Local Government Areas, rural, urban sectors or States).

The items and scopes which should be covered are as contained in the **Statement of Requirements (SOR)**. Attributes of crop and livestock husbandry covered by crop and livestock statistics include: farm practices and characteristics, farm equipment and infrastructure, crop production, manpower, income and expenditure in crop production, education, extension services, research and development.

The details covered by the-time series of these attributes as well as the principal crops and Animals to which they refer are included in the SOR.

Statistics of crop and Animals husbandry are useful for planning and research by Government ministries and agencies at national, ministerial and sectoral levels; and by research institutions, private individuals and international organisations.

[b] *Forestry and Wildlife Statistics*

Forestry and wildlife statistics cover data on management, utilisaton and conservation of forest and wildlife resources. They also include statistics of activities in the secondary sector with which the sub-sector is forward-linked. The items covered by forestry and wildlife statistics include land resources data; forestry manpower; forestry finance; timber production statistics; prices; wood-based industry data; international trade data; areas of games reserves, parks and zoological Gardens; distribution of Animals in zoological Gardens and games reserves by species, gender and age and statistics of endangered species of Animals and plants.

[c] *Fisheries Statistics*

Fisheries statistics include all statistical information on the business activities of Artisinal fishermen, aqua culturists, commercial in-shore trawler operators and importers of fish. In addition to landings of different species of fishes, the sector's statistics also include quantity and price data on inputs, equipment and facilities in fish production as well as prices of different categories of fish. As a result of the ubiquitous nature of fishing activity, spatial coverage is not as easily defined as in the case of crop and livestock statistics. Nevertheless, fisheries data are also reported on State and National bases. The items of data and the scope of coverage are as contained in the SOR.

The attributes of fisheries and fishing activities covered include: socio-economic information about fishermen and other manpower in fish production and distribution; commercial fishing practices and characteristics; fish production and imports infrastructure, equipment and inputs in fish production; education, extension services, research and development.

Uses and Users of Agricultural Statistics

Agricultural statistics are useful for planning, monitoring and evaluation purposes as well as research and development. They also promote investment opportunities.

The users include planners, researchers, Government ministries and their agencies, universities and international organisations.

3. Sources and Methods of Compiling Agricultural Statistics
Type of Sources
[a] *Crops and Livestock*

There are three main sources of statistics on crops and livestock. These are surveys & censuses, administrative and other sources.

In this context, a census is used to describe inquiries which are more or less straightforward counts, such as censuses of population, distribution and production. A survey refers to inquiries which go beyond simple enumeration.

All routine sources of official statistics on crops and livestock are classified as administrative. Statistics from these sources are generated on routine basis such as day-to-day execution of the functions of the ministries and agencies.

Other sources of crop statistics are research institutes and international agencies.

[b] *Forestry and Wildlife*

The sources of data on forestry and wildlife are: the Federal Department of Forestry, which is a department of Federal Ministry of Agriculture & Rural Development [FMARD], the Forestry Research Institute of Nigeria and the Forestry Departments of the State Ministries of Agriculture and Natural Resources. In 1972, the Division of Wildlife Services and Conservation was created in the Federal Department of Forestry to co-ordinate wildlife activities throughout Nigeria. The Federal Environmental Protection Agency (FEPA) may also be a source of data on endangered species of plants and Animals. Similarly, some information on zoological and botanical Gardens and games reserves are also common to both the tourism and wildlife datasets.

Most of the time-series data which are collected and published on forestry and wildlife belong to the category of administrative or routine statistics. There is little evidence of surveys or censuses conducted for this sub-sector.

[c] *Fisheries*

Fisheries statistics can be produced through surveys, censuses and routine administration. In 1975 the Federal Department of Fisheries embarked on the National Fisheries Statistics Programme. The Director of Fisheries, in his capacity as the Chairman of the National Fisheries Development Committee, set up a sub-committee on fisheries statistics that year. This department has since then occupied a premier position in the production of fisheries statistics in Nigeria. Other sources are the Nigerian Institute for Oceanography and Marine Research, the River Basin Development Authorities, Fisheries Departments of State Ministries of Agriculture and Natural Resources and the Nigerian Lakes Research Institute.

Surveys and Censuses as Sources of Agricultural Statistics
[a] *Crops and Livestock*
Survey Objectives and Items of Data Collected

The most important sources of survey-census-based official statistics on crops are the National Bureau of Statistics (NBS) and the Livestock

Department of the Federal Ministry of Agriculture & Rural Development. The agricultural surveys and censuses earlier conducted on ad-hoc basis by the NBS were integrated into one operational programme called the National Integrated Survey of Households (NISH). The design of the NISH is based on the guideline of the National Households Survey Capability Programme (NHSCP), sponSORed by the United Nations.

The agricultural surveys conducted by the NBS under the NISH programme are: the Rural Agriculture Sample Survey (RASS), Census of Modern Agricultural Holdings (CMAH) and the National Agricultural Outlook (NAO).

The objectives of these inquires are to collect data on agricultural holdings in the rural and modern sectors of the economy (RASS and CMAH) and also to provide benchmark data on farm practices and agricultural production at Local Government, State and National levels (NASC and NAO) respectively.

In the surveys and censuses, information is collected on farm practices, characteristics, and production; sources of funds for agricultural activities, farm assets and liabilities; farm labour, renumeration and prices.

Design and Analysis of Crops and Livestock Surveys
Sample Design for Three Surveys/Censuses

A two-stage stratified sample design was used in the earliest surveys. Village-based 1962/63 population census weas used as frame in the first stage, while farmers constituted the second stage sampling units. As from 1974, Enumeration Areas (EAs) demarcated for the 1973 population census were selected in the first stage sampling units.

(i) *The National Integrated Survey of Households (NISH)*

In 1981, all household-based surveys and censuses conducted by the NBS [then known as the Federal Office of Statistics] were integrated into the NISH programme. Since then, two NISH programmes have been launched – in April 1981-March 1987 and April 1987-March 1993. Currently, the NISH is based on a stratified two-phase, two-stage replicated rotational design with EAs as first-stage units and households as second-stage units.

Each State of the Federation is a stratum which is sub-stratified into rural, urban, and semi-urban sectors.

Details of the selection procedure which is based on the EAs of the 1973 Census are explained in **Rural Agricultural Sample Survey of Nigeria: Manual Data Processing**, issued by the NBS in mimeograph form in 1989.

(ii) *The Survey of Modern Holdings in Agriculture*

The survey of modern holdings in agriculture, which was first conducted in 1981/82 and is supposed to be conducted annually, covers all holdings of agricultural concerns which:

- have permanent locations, employ paid workers, keep proper records, and utilise modern implements in farm operations.

The lists of operations of such holdings are obtained from:

- the Register of Businesses (Federal Ministry of Commerce).
- Ministries of Agriculture (State, Federal).
- State Chapters of professional associations such as the Poultry Association of Nigeria.
- Advertisements in daily Newspapers.

The National Agricultural Sample Census (NASC)

The National Agricultural Sample Census (NASC) covers three categories of land holdings:

(1) all land holdings (except kitchen Gardens) which are traditionally operated.
(2) urban farmers.
(3) modern sector agriculture (farm settlements, plantations, experimental farms, etc.).

The first two are covered on sample basis while all identified holdings in the third category are included in the censuses.

The unit of reporting is the household. A two-stage stratified sampling design is used with Enumeration Areas (EAs) as first stage units and households as second stage units. In the first stage, 300 EAs are selected with equal probability from each State using systematic selection procedure. These are grouped into 150 strata. In the second stage, two EAs are selected from each stratum. Finally, 20 households (10 households which engage in arable crops and/or livestock rearing and 10 which keep livestock and poultry only) are selected from each stratum. Up to date, NASC has been conducted for 1950, 1960, 1974/75, 1984/85 and 1993/94 at approximately ten-year intervals.

(iii) *The National Agricultural Outlook*

In the survey which is on quarterly basis, the farming households covered under the NISH in the current year are used as frame. Farmers included in the survey are selected on the basis of location (Local Government Area, Urban/Rural), and nature of holdings in terms of form of ownership and organisational structure.

Questionnaires: Types and Contents for Four Surveys/Censuses
(i) *The National Integrated Survey of Households (NISH)*

The sixteen questionnaires and recording schedules used for collecting the data of the Rural Agricultural Sample Survey (RASS) are in seven categories. as follows:

1.   Household Form (Form HH) Household Listing Form: This It is a list of all households in selected EAs with information on physical location of household, number of persons in household, number, and size of selected farms.

2.   Master Sample (Form MS): It is a list of all housing units and households selected for the surveys using sampling interval applied to total households listed in (1) above with similar information as in the household form.

3.   Household Details Enquiry (Form HHD): It is a list of all household members selected from the master sample with information on household number, name of head of household, names of household members, relationship with head of household, gender, primary and secondary occupations, level of education and estimated annual income.

4.   Farm Survey Information: There are 3 forms (FS1, FS2, FS3) here. FS1 contains information on name of head of household, household

selection number, total number of farms operated by household, number of plots on each farm, description of the cadastral; survey of six plots on each farm, descriptions of the crops and economic trees in each plot and dates planted. This form is repeated for as many as five farms (A to E) per sample farming household. FS2 is for entering information on each yield plot, physical location, technical details of selection procedure, list of crops and economic trees. FS3 is for information on all surveyed farms of each household, including crops grown in plot, measurement of the yields of economic trees.

5. Crop Yield Measurement (Form YCE and Note Books): Form YCE is for recording yields of crops from laid yield plots. Information is plot-specific. Note Book C is for entering detailed field information on crop yield measurement, including crop date, time, area and weight.

6. Forms for Collecting Farmers' Information (Forms FI(1) to FI(6): The six forms are designed to collect information on the following topics respectively.

[i] Land Tenure: This form is completed for each household. Areas of each farm held under each of three categories of tenure (owner-like possession, rented, and other tenure) are identified here.

[ii] Application of Fertilizers and Pesticides: Information collected on this form include farm plot treated, area, type brand, source, quantities and prices of chemicals.

[iii] Farm Gate Prices: Information collected on this form include crops, quantities produced, consumed and sold & weights [all in local units of measurement]; unit prices, distances and modes of transportation to the nearest and alternative markets.

[iv] Selected Facilities: Information collected is on sources, usage and ocapacities of agricultural machinery and equipment, storage and processing facilities.

[v] Credit Facilities: Information collected is mainly on type of credit.

[vi] Employment in Agriculture: Information collected include hours worked and corresponding wages for each of seven days in the survey week and details of other non-agricultural occupation(s).

7(i) Livestock Information: (L1, L2A and L2B): L1 is for taking an inventory of livestock and poultry as at June; L2A and L2B are for recording changes in stocks of livestock and poultry between June & September and September & December respectively. The stocks covered are Goats, Sheep, Cattle, Donkeys, Horses, Pigs, Camels, Chickens, Ducks, Turkeys, Guinea Fowls, Geese and Pigeons.

(ii) The Survey of Modern Holdings in Agriculture: The questionnaire used in collecting information on modern holdings in agriculture contains questions on these attributes as recorded for the number of such holdings in each State:

1. Form of Ownership or Legal Status: One person/partnership/ Government/cooperative/limited liability/others.

2. Crop Production: Selected major crops/area planted/production/ yield per hectares.

3. Livestock Production: Poultry by types, numbers kept, other Animals by type, numbers of matured/immature Animals.

4. Soil Dressing: Lime and others, area dressed/quantities/costs.

5. Amounts of Loans by Type: Bank/cooperative/family account/ Esusu/advance from buyers/personal account/others.

6. Equipment: Number of holdings which reported the use of selected equipment — grinding/grating/peeling (machine)/grain (mills)/others.

7. Number of holdings which use selected storage facilities — groundnut pyramid/silos/rumbu/barn/farm store/others.

8. Employment and Remuneration: Number of workers by categories, permanent/temporary/occasional, output and remuneration, hours worked/amount received (cash/kind).

9. Marketing Channels: Number of holdings which sold products through selected outlets — locally (to canning and slaughter houses/other uses) or to export.

(iii) *The National Agricultural Sample Census [NASC]*: Some of the questionnaires designed for the RASS are also used for collecting information on the NASC. These are: the Household Form (HH), the Master Sample Form (MS), the Household Details Enquiry (HHD), Crop Yield Measurement (YCE), Forms for Collecting Farmers' Information (FIC1) (Land Tenure), FI(3) (Output and Prices) and FI(6) (Employment in Agriculture) and L1 (Inventory of Livestock as at June).

Details of the information collected on these forms are as Stated above under the NISH.

(iv) *National Agricultural Outlook*: Three recording schedules and questionnaires are used in collecting information in respect of this survey. These are:

1. List of Local Government Areas and Number of Enumeration Areas (NAO/1). It has columns for information on State, LGA, Number of EAs in the frame. These are covered under current NISH and distribution of EAs into Urbans, Semi-Urban, and Rural.

2. Crops Grown by LGAs (NAO/2). This has columns for information on State, LGA and crops grown by majority (more than 50%), less than half (30-50%) and few (less than 30%) of the farmers.

3. General Information on Land Preparation, Planning, Weeding, Harvesting (NAO/3). It has the following four sections:

[i] Identification of farmers (State, LGA, EA, Town, District, and other details from the NISH).

[ii] Background information to be obtained from the NISH by NBS State Officer.

[iii] Information about general characteristics of farmers in the frame (location, form of ownership, structure of organisation and access to selected facilities).

[iv] Crop-specific information on crop, area cleared, area planted, production in each case for current and last seasons. This section also contains sub-sections for collecting categorical information on the status of selected farming activities, factors and events which affect the production of selected crops (weeding, germination, planting, irrigation, rainfall, farm inputs, etc.). In the schedule, 48 are crops identified, out of which 36 are coded as temporary crops (grains, root crops, seed crops, vegetables, pulps, and miscellaneous), and 12 as tree crops.

[a] Analysis of Crops and Livestock Surveys and Censuses

The processing of survey and census results consists of a series of elaborate tasks. It commences with editing and sorting. The complex sampling procedures adopted in the designs of RASS and NASC dictate the corresponding use of statistically rigorous methods in computing estimates of parameters such as area, production and yield of the various crops.

The analysis of the result obtained in RASS is described in **Rural Agricultural Sample Surveys of Nigeria: Manual Data Processing.** The estimates covered include those on:
- crop production (area, output, yield).
- farm inputs.
- farming households.
- land tenure (area under different tenure).
- inventory of livestock and changes in stocks.
- farm gate prices.
- employment in agriculture (paid employees and unpaid family workers).

As indicated in the foregoing, some of the topics covered in the RASS questionnaire and recording schedules are also included in the relevant NASC schedules.

The sector of agriculture which is included in the survey of modern holdings and NASC covers the total population of all such holdings that are identified. Hence the procedure for analysing the responses is similar to that used in respect of administrative statistics. Processing analysis consists of extraction, aggregation and annual cross tabulation of the States and Federation with attributes such as
- number of holdings, area planted in Hectares, production (tonnes) and yield per hectares (tonnes) for 27 major tree and food crops and agricultural products.
- number of holdings, number of mature and unmature Animals for 8 Animals and 5 types of poultry.
- number of holdings, area (Hectares), quantity (tonnes) and cost (Naira) of three types of fertilizers and soil dressings.
- amount of agricultural loans obtained from seven sources (e.g bank, cooperative, farming account, etc.).
- number of holdings which used ten selected processing equipment and storage facilities.
- categories of workers, number (permanent, temporary, occasional), paid in cash (number, hours worked, wage bill), paid in kind (number, hours worked).

[b] Forestry and Wildlife
A comprehensive survey of wildlife in Nigeria was conducted in 1962 and findings revealed heavy depletion when compared with neighboring countries. This informed the recommendation of far-reaching measures, including total ban or restriction on hunting and the establishment of eight additional games reserves.

[c] Fisheries Surveys and Censuses
[i] **Artisinal and Commercial Fishing**

The maiden national investigation on fisheries statistics was the National Fisheries Sample Census launched in 1975. The objective of the exercise was to provide reliable and adequate fisheries data which can be used for:
- planning fisheries development projects.
- estimating the fisheries sub-sectoral component of the system in National Accounts.
- research on fisheries and fishing activities.

In the sample census, information was collected on the structure and output of the sub-sector, and on the economic aspects of Artisinal , commercial fishing and fishing in off-shore waters, lakes and ponds. The primary sampling units were in two groups:

1.   commercial fishing carried out by fishing companies using trawlers for fish and prawns and land frozen fish in Nigeria. The landed frozen fish are treated as imports since they are brought in by chartered vessels owned by foreigners.

2.   Artisinal Fisheries which is fish production by informal fishing units such as individual fishermen operating canoes along the nation's coastline in brackish water, creeks, rivers and lakes.

Since there is a list of all the commercial fishing companies, commercial fishing is covered on total population basis. Artisinal fishing activities are covered on a sample basis because the **large number of course** and fishermen included are scattered all over the coastline, creeks, rivers and lakes.

[ii]   **The Sampling Design**
Four surveys are conducted for two categories of fisheries as follows:
1.   Artisinal Fisheries
   (a)   Frame Survey (once a year)
   (b)   Catch Assessment survey (monthly estimate)
   (c)   List survey (once every quarter)
2.   Industrial Fisheries
(d)   Catch Report survey (monthly)
(a)   **The Frame Survey**
The purpose of the frame survey is to prepare complete listing of all fishing sites for the Catch Assessment Survey and to collect basic statistics such as the number of fishermen and types of fishing gears used in each of the landing sites. It is carried out once a year and all landing sites in the country are to be covered. Literate fishermen in each landing site are interviewed.

(b)   **Catch Assessment Survey**
The purpose of this survey is to collect Fisheries-region-specific data on monthly total catch by species and monthly total number of trips of Artisinal fisheries for each type of fishing gear. Nigeria's coastline is divided into five administrative divisions coinciding with Lagos, West (now Ogun), Midwest (Edo and Delta), Rivers and South East (Cross River). These are referred to as Fisheries regions. From the list of landing sites in each Fisheries region, a three- stage stratified sampling design is adopted for selection purposes. The landing sites stratified into large and small are the first-stage sampling units. All large sites are included with probability proportional to size. Sample days are second-stage sampling units. These

are usually two or more per site and the information is recorded in a monthly schedule form. Third-stage sampling units are canoe arrivals.

On each sampling day, about five canoes are selected in each sampling site and for each type of fishing gear used. The quantities of fish landed by the sample canoes are usually estimated or weighed physically.

iii]   Analysis of Survey Results

The following parameters are estimated from survey returns for each type of gear and each sample landing site: daily total catch and monthly total catch.

Estimates of daily total catch for each landing site is obtained by multiplying the sample landing site estimate by a raising factor defined as the total number of canoes fitted with gear type I say, divided by the number of sampled canoes fitted with gear 1.

Similarly the monthly total catch for each sample landing site is obtained as the products of the daily total catch per sample landing site for census using gear type, say, multiplied by the number of fishing days in the month.

Regional estimates are also computed using the estimates of total monthly catch for each catch for each sample landing site. Since all large landing sites are automatically included in the sample, the estimated monthly total catch in a Fisheries region is the sum of monthly catch in all of the region's big landing sites plus estimated monthly catch in region's small landing sites. The latter is obtained as a weighted sum of estimated average catch per 'small' sample landing site. the weights which are the raising factors are the total number of canoes with gear type 1 in each small sample landing site divided by the number of canoes with gear type 1 in that small sample landing site.

Also, the monthly total number of trips for each type of gear used at each sample landing site is estimated by multiplying the number of monthly trips made by the sample canoes using a particular gear in the sample landing site by a raising factor defined as the total number of trips made during the month by all the canoes at landing site divided by the number of trips made during the month by sampled canoes in the landing site fitted with the same type of gear.

Regional estimates of monthly number of trips are obtained in a similar manner as those for monthly estimates of fish catch.

The following series are obtained from the analyses of the fisheries survey described above:
-    monthly total catch by species.
-    monthly total number of trips for each Fisheries region.
Each of these series is also compiled for each type of fishing gear.

Administrative Sources of Agricultural Statistics
Objectives and Items of Data Collected
[a]   Crops and Livestock Statistics

The producers of administrative statistics on crops and livestock have the following objectives:

(1) to complement estimates obtained from surveys and censuses and compile data on commodity trade.

(2) to provide estimates of inputs of other resources such as credit, veterinary and extension services, fertilizers, pesticides, machinery and equipment, which are not obtainable through surveys or censuses.

(3) to provide market information on cash crops and on the supply utilisation account of agricultural products.

(4) to provide better estimates for national accounts.

Items of data on administrative statistics are either the sole sources of information or those which complement survey and census data on crops. They are as follows: land use pattern, crop area, production, utilisation and yield; production costs and use of inputs and facilities, stock and storage facilities; export, import and prices statistics; agricultural manpower and the performance of selected agricultural operations; rural infrastructure; information on weather, diseases, and pests.

On livestock statistics the items are: livestock farming population, structure of livestock, livestock products, number of slaughter houses and slaughtering; prices of livestock, meat, feed and livestock products and cost of storage; livestock movement across the State and international borders, imports of livestock and livestock products; grazing reserves and pastures; information on diseases and epidemics.

Major producers of administrative statistics on crops and livestock are:
- the National Bureau of Statistics.
- the Central Bank of Nigeria (CBN).
- the Federal Department of Agriculture.
- the Federal Department of Livestock and Pest Control Services.
- the extension services divisions of the State Ministries of Agriculture and National Resources.
- the Field Project Monitoring Unit (FPMU) the Federal Ministry of Commerce and Tourism.
- Agricultural Project Monitoring and Evaluation Unit (APMEU).
- the Livestock Monitoring, Evaluating and Coordinating Unit.
- the Federal Agriculture Coordinating Unit (FACU).

Procedures for Collecting and Collating Administrative Statistics on Crops and Livestock

Administrative statistics are records of activities which take place on a regular basis and in the course of the day-to-day activities of the relevant agency.

One category of administrative statistics referred to as returns are collations or summaries of the information supplied by households and corporate bodies prior to their having access to services or facilities. Returns may also take the form of summaries of routine information collected by enumerators in respect of each Local Government Area in a State such as number of cattle slaughtered, area of cassava farms planted/harvested, etc. A common feature of returns is that they can be aggregated over time, individuals or space.

The second category of administrative statistics focus on prices which cannot be easily aggregated as referred to above. Each price is either the average for a fairly homogenous commodity obtained from several marketing outlets (such as 50 kilogrammes of yellow maize, brown beans or long grain rice) or an average for non-homogenous units of a commodity obtained from one market (such as a large cow or a medium-size ram at,

say, Bodija Livestock Market where 'large' or 'medium' cows to be priced are those exceeding 300kg and those weighing 200-300kg respectively). In such surveys conducted by the Livestock Monitoring Evaluation and Co-ordinating Unit (LIMECU), not less than 30 Animals or 30 marketing outlets are used.

The instruments most frequently used in collecting data are forms and schedules, which are completed regularly by the agency's field staff, households and operators of modern holdings. The data on prices are collected more frequently (weekly, monthly) than returns on area, production, farming population and structure of livestock all of which fluctuate less rapidly than prices.

To facilitate and accelerate the collation and dissemination of statistical information on the production and distribution of key agricultural products, the Federal Ministry of Agriculture & Rural Development [through its Planning, Research and Statistics Department (PRSD) established a Market Information System (MIS)]. This is an input into the Crop Monitoring and Early Warning System (CMEW) launched in 1988. Each Field Project Monitoring Unit (FPMU) is requested to transmit information on prices of agreed units of 30 selected food items from chosen urban and rural markets of each State of the Federation to the PRSD. The original plan was that such information would be radioed into the PRSD, but due to financial constraints, transmission is through official mailing and personnal delivery. The prices covered are retail, market and farm-gate rates.

Methods of Analysing Administrative Statistics on Crops and Livestock

When administrative statistics are obtained by total enumeration of the relevant population, the observed data are in the form of returns by districts, zones and Local Government Areas in respect of different items of data (farming population, area, livestock population). Thus, no rigorous statistical formula is required for data processing. The processing usually carried out are editing, cross-tabulation, extraction and aggregation.

As already noted, price statistics are usually collected on sample basis and are reported as unweighted averages of prices of non-homogeneous items in a selected market or unweighted averages of prices of fairly homogenous items at selected marketing outlets.

Most of the cross-tabulations of time-series of administrative data are either State- and item-specific, e.gs.:
-   crop production: area (Hectares), production (tonnes) for major crops.
-   input utilisation: itemised plant protection chemicals, fertilizers and agricultural equipment.
-   extension services: numbers of extension workers, families covered, farm visits and farm trial and area of land covered.
-   livestock production: numbers of selected types of livestock.
-   exports of selected agricultural products, by destination (volume and value).
-   imported commodity by source (volume and value).
-   average prices of livestock and poultry products.
-   fertilizer prices paid by farmers or commodity- and market-specific such as the average prices of live Animals, poultry and their products.

[b] **Forestry and Wildlife Statistics**

Administrative Sources of Forestry and Wildlife Statistics are in two groups: those which are collected at State level and those which are collected nationally. In the first group are Local Government Areas- and divisional administration-based information on fellings of trees, production of logs and timber usually collected by the field staff of the forestry departments of the State ministries of agriculture and natural resources.

Information on wildlife statistics is very scanty in Nigeria. In addition to the Federal and States departments of forestry, other sources of information are:
-    Wildlife Departments of Nigeria Universities.
-    the managements of over 60 national parks and games reserves.
-    Kainji Lake Research Project (now known as National Institute for Fresh Water Fisheries Research).

Most of the administrative statistics in forestry and wildlife sub-sector are based on reports and returns forwarded by field offices to the headquarters which extract and aggregate them for transmission to a higher level of administration until national aggregates are obtained.

Administrative Sources of Fisheries Statistics

The objective of collecting administrative statistics on fisheries are basically the same as those for crops and livestock. These are:
[i]   supplementary information obtainable through surveys and census.
[ii]   provide international trade figures on Fisheries products.
[iii] provide statistical information on the sub-sector's input structure, especially on aquaculture.
[iv] facilitate the compilation of the sub-sector's component of the system of the national accounts.
[v]   provide market information on Fisheries products.

The items of data on which administrative sources are predominant are at present on the imports of Fisheries products and a few aspects of fish farming activities.

The main sources of administrative statistics on fisheries are Federal and State Departments of Fisheries, National Bureau of Statistics and the Nigerian Institute of Oceanography and Marine Research.

The items of fisheries statistics published on a regular basis are the imports of selected commodities in the category by volume and value as compiled by the NBS and the gross registered tonnage of fishing and fishing trawlers.

Problems of Administrative Sources of Agricultural Data

The problems hindering the supply of adequate agricultural data from administrative sources are numerous. These are common to all the sub-sectors of agriculture and are as follows:
(i)   inadequate professional staff for survey work.
(ii)   inadequate funding.
(iii) logistic problems, such as transportation.
(iv)   respondents' reluctance due to poor knowledge of data culture.
(v)   Excl.usion of important relevant information from some agricultural sub-sector, such as fishing.

(vi) inadequate capacity development for sample survey planning and execution.

Other Sources of Crops and Livestock Statistics

In addition to the statutory sources of data for survey, census and routine or administrative statistics on crops and livestock in Nigeria, there are other sources are research institutes and international organisations.

Two important international sources of data on agriculture are the Food and Agricultural Organisation (FAO) and the International Institute for Tropical Agriculture (IITA).   Where domestic sources yield implausible estimates, the FAO often uses peer country data with some necessary adjustments to arrive at their estimates for Nigeria.

As a result of its location in Nigeria, the research efforts of IITA have constituted a reliable source of specilised agricultural statistics. The   food security and nutrition components of country programmes funded by and implemented under the auspices of UNICEF also yield estimates of local Government- and State-based parameters on food production and demand.

4.   Current Methods of Data Storage and Dissemination
[a]   Crops and Livestock Statistics

Crop and Livestock statistics are stored mainly in hard copies of regular, occasional publications, mimeographs and working sheets. Although the analyses of a reasonably large amounts of data is computerised and the contents of several regular publications containing crop and livestock data exist in machine readable form, they have not been put into the form of databases.

Data retrieval for any purpose is still in the form of hard copies or at best files containing several records. Where datasets are stored in potable media such as diskettes or tapes they are compact or handy versions of hard copies.

The transfer of crops and livestock data still takes place mainly in the form of hard copies. Efforts made by some agencies to transmit the prices of selected food items by radio could not be sustained owing to resource limitation.

The dissemination of crops and livestock statistics therefore takes place in the form of exchange of hard copies of cross-sectional and time-series datasets; that is, regular and occasional publications, mimeographs, working sheets and records retrievable from files. A comprehensive list of these publications is provided in the Appendices.

Executed by the FAO and implemented by the Federal Ministry of Agriculture and Rural Development (FMARD), the Agricultural Data Bank Project took off in November 1989.

The immediate objectives of the project were to:

(a)   establish and develop in-house professional expertise and build up capacity and facilities for data collection, processing, reporting, banking and other automated-related activities in the PRSDs of the Federal and State Ministries of Agriculture.

(b)   carry out a nationwide sample census of agriculture.

As designed, the Agricultural Data Bank (ADB) was to be actively involved in data production in addition to coordinating data storage and retrieval activities from sources listed inter alia. Its sphere of influence was also to include all Federal and State Ministries and units involved in the production and storage of agricultural data. This was a recognition of some of the peculiarities of agricultural data production, especially with reference to:

(a)   scope, geographical coverage and cost.
(b)   the need for regular farmer-statistician (enumerator) interaction.
(c)   multiplicity of participating agencies.

Although some staff of the FMARD benefited from capacity development in the execution of the Agricultural Data Bank Project (ADBP), the exercise was initially faced with a number of logistics constraints: distance from the NBS — Lagos to Abuja, inadequate counterpart funding, and uncoordinated data production activities of numerous units.

In reaction to the problems of coordination posed by the existence of numerous agencies participating in the production of agricultural statistics, FMARD set up an eleven-man working group to make recommendations on issues that would harmonise the production and dissemination of agricultural data. In its final report, the group made a number of recommendations on the content of agricultural statistics, organisation, structure, framework and designs for collecting such data.

During the 1992 Conference (which like earlier meetings focused on the establishment of Agriculture Information Management System), the following issues were addressed:

-   institutional arrangement for agricultural data management in Nigeria.
-   the establishment of an agricultural data bank.
-   the committees for agricultural data management.

Consequently, two coordinating bodies were proposed:

(i)   the National Agricultural Statistics Coordinating Committee (NASCCO) to provide policy guidelines on the contents, production and the activities of producers of agricultural statistics in Nigeria.

(ii)   the State Agro-Statistics Coordinating Committee (SASCCO) to coordinate the production of agricultural statistics at the State level according to directives received from the NASCCO.

The 13 members of the NASCCO are to be drawn from the FMARD (PRSD) (2), National Bureau of Statistics (NBS) (1), CBN (1), Universities of Agriculture (3), Agro-Meteorological Services Department (AMSD) (1), National Planning Commission (NPC) (1), Agricultural Research Institutes (2), and National Agricultural Data Bank (Secretary). Members of SASCCO are to be drawn from State counterparts of some of the agencies listed under the membership of NASCCO, including the River Basin Development Authorities (RBDAs), ADPs, and State Offices of the APMEU, NLPD, FACU and LIMECU.

The **Handbook on Agricultural Data Management** published by the PRSD of the FMARD in 1992, also contains information on the hosting agencies and funding of the committees.

These efforts initiated by the FMARD have yielded detailed proposals, including sample survey and questionnaire designs for producing

agricultural statistics. The manpower, funding and organisational requirements for successful implementation are numerous, hence reliance on the nationwide network of the NBS, at least in the initial period, was inevitable for a successful take-off of the production of agricultural data by the FMARD.

[b]   Forestry and Wildlife Statistics

The available time-series data of this sub-sector are in hard copies published by the Planning, Research and Statistics Department (PRSD) of the FMARD in **Digest of Agricultural Statistics.** Statistical information on wildlife is, as stated earlier, very scanty and not available in any regular publication. There is no evidence of computerisation of forestry and wildlife statistics at State or National level. Data transfer and dissemination are in the form of hard copies.

[c]   Fisheries Statistics

Fisheries statistics, like crops and livestock statistics, are stored in hard copies. Although it was stated in **Fisheries Statistical Survey of Nigeria Report 1975-1976** that all survey data were processed at the Federal Department of Fisheries with the aid of Wang Mini-Computer, this was a temporary phenomenon because a survey of the Nigerian statistical system carried out in 1993 revealed that the Fisheries Department had no computer.

Currently, there is no data base of fisheries statistics. In Section 4.05 (pp. 26-28) of the SOR, the operators of the NBS have proposed 8 tables (items) containing 233 variables, which can form the nucleus of a fisheries time-series database. This is based on available fisheries statistics as produced by Federal and States Department of Fisheries and the NBS.

5.   NBS Data Base Coding System for Agricultural Statistics
The Division Code

Attempts have been made to follow the coding system used in the International Standard Industrial Classification (ISIC), revision 3 issued on 4 August, 1988. Thus, the **division** code or the first two digits of the code assigned a seven-code-variable (which identifies the division to which the dataset belongs) is, wherever feasible, taken from the ISIC. The ISIC division codes have been allocated on isomorphic basis in respect of most sectors, except where proximity to the nearest closely related ISIC code and existence of un-used codes were the basis for the allocation of codes. Going by this system, the Livestock sub-sector of Agriculture has been assigned code 03, while Land Resources is assigned code 06 since these codes are un-used in the ISIC. Hence, Agricultural Statistics has been divided into the following five [5] main divisions:

01   Crops
02   Forestry and Wildlife
03   Livestock
05   Fisheries
06   Land Resources

The Items and Details Codes

While efforts have been made to ensure that the division code or the first two digits of the code assigned to each variable conforms as much as

possible with the ISIC, the items and detail codes which form the last five digits of the code assigned to each variable are arbitrarily determined. The Division-Item-Detail (DID) coding system is the basis for coding the NBS's datasets. Thus under each dataset is the elementary entity or group of elementary entities (multiple-item cases) about which statistical data are gathered. For example, in the Forestry and Wildlife division, "Output of Selected Forest Products in Nigeria" coded 02001-02003 are three items with 21 details in common.

Generally, the National Bureau of Statistics (NBS) is using six-digit-code for attributes (variables). But in Agriculture, a seven-digit-code has been adopted because of the complexity of the data. The first two digits are used to identify a particular division. The first five digits are used for a particular item with the first two digits as the division code and the last three as the item code under that division. Where an item is repeated in two or more divisions, that item is assigned the same 3rd, 4th and 5th digits code. The single-item-cases have details peculiar to them such as item 0l37015 titled "Average Cost of Labour and Equipment for Mechanised Application of Fertilizer". The crop division has 567 items [01001-01567], Forestry and Wildlife division 73 items [02001-02073], Livestock division 80 items [03001-03080] and Fisheries division 50 items [05001-05050]. In coding the details, seven digits are used to identify a particular attribute [variable] as follows: the first two digits for the division, the next three for items under that division and the last two [that is, the 6th and the 7th digits] for the detail [variable] under the division and the item.

Based on this coding system, the NBS data structure for Agricultural Statistics is as shown below:

CONCLUDING REMARKS

Agricultural Statistics constitute a wide area for which much attention should be given to data collection, processing and management. The different agricultural agencies should, in conjuction with the National Bureau of Statistics (NBS), produce timely and reliable data relating to their areas of jurisdiction. Efforts should be made to educate the peasant farmers on the intrinsic use of data and, therefore, the need to liaise effectively with the data collection field officers. It is important for the Government and other funding agencies to appreciate the huge costs involved in data collection, processing and management.

[a] Crops and Livestock Statistics

The production, analysis and dissemination of survey- and census-based crops and livestock statistics maje up one of the most elaborate single subject-matter activity undertaken on a fairly regular basis by the NBS. The FMARD, the various project coordinating and/or monitoring units and the State ministries of agriculture and natural resources also make substantial contributions to the gathering, collation and publication of largely administrative statistics on crops and livestock. In addition, a few parastatals and agencies such as the Central Bank of Nigeria (CBN), River Basin Authorities and international agencies have been participating in the production of agricultural statistics in the country.

In 1991, efforts made by the Federal Department of Livestock (using a consulting firm) yielded some results. The Federal Ministry of Agriculture & Rural Development also organised several workshops, seminars and conferences in 1984-1992 in which the themes focused on the harmonisation of the production of agricultural statistics. These efforts have resulted in the production and publication of numerous items of time-series data on agriculture. Some of these are included in the Statement of Requirements (SOR) which is the second part of this document. The SOR is the contribution of the National Bureau of Statistics (NBS) to the activity of data storage, output processing and direct access retrieval through the use of a relational database of agricultural statistics.

In spite of all these efforts, Nigeria's crops and livestock statistics are still characterised by untimeliness, lacunae or incompleteness (space-and time-wise) and absence of information on reliability of estimates. The problems which affect the production of crops and livestock data in the country can be grouped into those resulting from resource limitations as well as from methodological and non-response problems.

In Nigeria, data production is yet to be recognised as a costly venture. Every producer of crops and livestock data interviewed complained of inadequate resources, especially in vehicules, other equipment, support and funding. The delay of three to four years in publishing results of data collected is partly due to these problems.

When resources permit, RASS should be more rural-farming-community based by having a frame which is independent of that of NISH. While the household may be a more convenient second stage unit for some modules of NISH, the farming dwelling unit may provide a solution to the non-response problem of 'household no longer here' frequent in RASS.

In executing data production plans in Nigeria, non-response at household, corporate (modern holding) and agency levels is a serious problem. Some features of this problem and possible inducements and sanctions are discussed in Iyaniwura (1993). While household and corporate non-response are typical problems of survey- and census-based data collecting activities, these as well as agency non-response are the constraints of the producers of administrative statistics. Much of the State-based data on crops and livestock are published with numerous blank cells for several years. This makes nonsense of any national aggregate that may be computed for the reporting States. Coupled with the fact that not all the Zones or Local Government Areas in the reporting States have actually made returns to the agency, the reliability of the national aggregate is even more suspect.

Finally, for most of the estimates of parameters such as production, area, yield obtained from surveys and censuses, there are no standard errors and the reliability of such estimates cannot be assessed.

These are some of the problems which render some estimates of key parameters (such as crop yields) inconsistent with peer country data, and compel international agencies to search for non-domestic sources.

[b] Forestry and Wildlife Statistics

As already noted, time-series data on forestry and wildlife are still very scanty in Nigeria. Most of the items of data identified and listed for collection on forestry by the PRSD of the FMARD in the Final Report of the Committee on Institutional Framework for Agriculture Data Harmonization in Nigeria, 1991 are not being collected. A reasonable range of administrative statistics, which should be produced and collected on wildlife, are at present not receiving attention. These include:

- population of Animals in zoos, parks and games reserves by species, gender and age.
- number of endangered species of plants and animals.
- areas of games reserves.

- medicinal and pharmaceutical uses of forest and wildlife products.

Since population census of animals in games reserves may not be feasible, special surveys should be designed to study the distribution of selected small and large animals in areas of land demarcated for that purpose.

Bush meat has become rather important as a source of animals protein and there is need for regular information even if it is based on survey of bush animals killed or trapped. Information on the distribution of such Animals by gender and age will be a useful basis for forecasting the extent to which species are endangered.

[c] Fisheries Statistics

The Federal Department of Fisheries [FDF] has taken bolder steps than any other department in the FMARD to be self-sufficient in the production of its own data. Consequently, it is the least dependent on other agencies, especially the NBS in the collection, analysis and publication of its statistical data.

This is not stating that all is well with the fisheries statistics as currently produced and published in **Fisheries Statistics of Nigeria.** Some of the problems confronting the producers of these statistics are mentioned on page 10 of **Fisheries Statistical Survey of Nigeria**. They would be discussed under *Management, Statistical Production Methodology, Data Processing and Relationship with Other Data Producing Agencies.*

The FDF does not have adequate professional staff to undertake survey work. The extensive use of temporary staff for enumeration and the absence of permanent zonal outfits, confirm this observation. The funding of the fisheries survey has not been adequate as observed in the document referred to above. Indeed, as demonstrated by the funding of the first survey, it took some time for Government to be convinced of the need for fisheries statistics other than as a component of the national accounts.

On production methodology, the following comments are noteworthy:

i.   The methodology of conducting the fisheries survey is not clearly stated in the handbook. The sampling design and estimation producers can be more concisely described.

ii.   The respondents' hostility to weighing of their catch by enumerators is disturbing as the substitute method of estimating the catch by sight is a sources of serious error since such estimates are blown up with several raising factors.

iii.   There is too detailed emphasis on species of fish in survey data collection and publication.

iv.   Fisheries statistics as currently collected, analysed and published by the FDF Excludes other statistical information which are also very important to users of fisheries data. These include consumer prices, prices of feeds, prices at landing sites, distribution of coldrooms by State, distribution of smoking kilns by zones and selected activities of fisheries-related manufacturing industries.

Finally, the FDF should work in closer relationship with the NBS, especially in the areas of capacity development for sample survey planning and execution.