

**Use of household surveys  
for collection of food  
and agricultural statistics**

**Provisional**

**Statistics Division  
Economic and Social Development Department**

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ISBN 92-5-101468-X

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PREFACE

When the United Nations National Household Survey Capability Programme (NHSCP) was launched in 1977, the Food and Agriculture Organization of the United Nations (FAO) took an interest in, and supported, this project by appointing a senior staff to coordinate its statistical activities related to food and agricultural statistics.

The present manual is part of the contribution of FAO in implementing the NHSCP. Its aims are to serve as a guide in the collection of agricultural statistics through households, within the context of the Programme. This manual, conceived within a particular framework, should be seen as complementary to other manuals already made available by FAO. Therefore, general guidelines of census and survey taking are not treated here. Only problems arising from the integration of agricultural surveys in national household survey programmes are considered.

This manual is a first attempt to overcome new problems which may arise in agricultural surveys viewed within the context of an overall integrated programme of surveys and, consequently, cannot be complete. Other problems will certainly appear later when some countries will have carried out their survey programmes and encounter other problems. This manual will then be completed and revised on the basis of the experience of countries in using it.

The preparation of this manual was mostly the work of an FAO Consultant, Dr. Abel Nkougourou Ebongué, formerly UN/ECA regional adviser for household surveys. In preparing this manual, the consultant held extensive consultations with interested international and regional organizations and with a large number of national and international experts. FAO wishes to acknowledge and express its appreciation of the contribution made by all those who were consulted.

Users of this manual are kindly invited to communicate their comments on its contents and to convey the results of their experiences in its use to the Director, Statistics Division, FAO, Rome, Italy. We would also appreciate receiving copies of methodological and practical material describing their surveys, as well as reports containing the resulting data.

C.L. Quance  
Director  
Statistics Division

## CHAPTER 1 INTRODUCTION

### Basic principles, purpose and main characteristics of the guide

The present manual deals with the use of household surveys for collecting data on food and agriculture, within the framework of the United Nations National Household Survey Capability Programme (NHSCP).

### Historical background

The Economic and Social Council of the United Nations adopted a resolution, 2055 (LXII), on 5 May 1977, and a further resolution, 1979/5 on 9 May 1979, on the National Household Survey Capability Programme. These resolutions, among other things, stressed the importance of continuous and integrated household surveys, for providing essential information on economic, social and demographic conditions of people in developing countries; emphasized the value and the importance of the NHSCP as a major and much-needed development activity aimed at building enduring capabilities in developing countries to conduct their own integrated surveys programmes; requested the Secretary-General, in collaboration with agencies concerned, to coordinate household survey technical cooperation activities within the context of the NHSCP and strongly urged the multilateral and bilateral donor agencies to provide resources to help developing countries implement their survey development activities, and to ensure that the survey activity they may promote will be compatible with, and contribute to, the Programme.

The NHSCP objectives also meet FAO objectives. In fact, the World Food Conference (1974) in elaborating its approach to developmental effort stressed the need for integrated statistics, particularly those on households.

Therefore, along with the United Nations Statistical Office, Regional Commissions and other specialized agencies, FAO is fully participating in promoting the NHSCP. Many reasons militate in favour of this participation; some of them are as follows:

- Data needed for food security provide the general framework for the coordination of statistical work of FAO with other agencies in the field of household surveys. Indeed, much of the data needed for estimating food production and food supplies can be provided only through household surveys.
- FAO is the lead agency in implementing the Programme of Action of the World Conference on Agrarian Reform and Rural Development (WCARRD), approved by the FAO Conference Resolution 7/79 and the General Assembly Resolution 34/14 following WCARRD. The Programme of Action spans a number of socio-economic areas which are best investigated through household surveys, and hence NHSCP is an essential instrument for this purpose.
- Further, because of the great importance of agriculture in many developing countries, particularly those least developed, household surveys include substantial elements of direct concern to FAO. This is, for example, the case of the African region where a majority of ongoing programmes of surveys include an important agricultural component.
- A village or locality is composed of people, and the primary objective of all development programmes is to improve their living standards. The problems of the people are better understood in the light of periodic statistics on various characteristics of the households to which they belong. Once village or locality is taken as the unit of planning, the collection of data on households which constitute the village or locality becomes inescapable. Household data on various items are therefore of vital importance in micro-level planning.

- Finally, in several countries scheduled to participate in the NHSCP, FAO also has ongoing or planned projects dealing with agricultural and related statistics.

#### Purpose of the manual

Two main sources of agricultural statistics are current surveys and decennial agricultural surveys. Because of the rapid changes that are taking place in the economics of the developing countries, the decennial censuses, even where they are comprehensive, are inadequate to provide timely information needed to monitor and evaluate the impact of development programmes on agriculture and rural economy. While some structural data may be easily obtained from government-managed farms, and sometimes from large private farms, similar data from the traditional sector, which covers most rural households in developing countries, may not be easily obtained. To obtain data on traditional agriculture, which represents a very high proportion of the total agricultural sector, it is necessary to promote a new approach, i.e. collecting data on the traditional agricultural sector through household surveys.

Because of the many inter-relations existing between agricultural and other socio-economic data needed for a better understanding of the household sector and also for compiling socio-economic indicators, the collection of agricultural data should be integrated in the national household survey programmes.

The present manual intends to serve as a guide for developing countries in collecting agricultural statistics through households, within the framework of the NHSCP.

#### Main characteristics of the manual

This manual is part of the contribution of FAO in implementing the NHSCP. It is therefore conceived within a particular framework, i.e. collecting agricultural data through household surveys and ensuring integration of agricultural data with other data collected from households.

Such an approach raises problems relating to data collection with respect to organization, survey content, sampling techniques, data processing and tabulation. The manual takes into consideration these problems. It should be considered as complementary to other manuals already made available by FAO, namely:

- Programme for the 1980 World Agricultural Census (1)\*/
- Collecting statistics on agricultural population and employment (2)
- Programme for statistics of food consumption and nutrition (3)
- Estimation of crop areas and yields in agricultural statistics (4)
- Guide to statistics of livestock and livestock products (provisional) (5)
- Agricultural census taking (6)
- Assessment and collection of data on pre-harvest foodgrain losses (20)  
due to Pests and Diseases
- Assessment and Collection of Data on Post-Harvest Foodgrain Losses (16)

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\*/ Numbers given in parentheses refer to the serial number of the reference as given in Annex List of references.

It is a well-recognized fact that the levels of statistical development differ widely between developing countries and that it is impossible to propose a single system of statistics to be applied universally or even regionally. It is also obvious that statistical censuses and surveys within the framework of the NHSCP should be designed to meet national needs and to provide information of primary interest to the users in the country. But it is also desirable to achieve regional and worldwide comparability, and this should be aimed at in a complementing way with national objectives.

#### Structure of the manual

Chapters 2 through 6 of the manual deal essentially with the substantive topics concerning the collection of agricultural data through household surveys, within the framework of the NHSCP.

Chapter 2 covers the following topics:

- Needs for agricultural data
- Sources of agricultural data
- Current practices in developing countries for collecting agricultural data
- Use of household surveys for collecting agricultural and related statistics.

Chapter 3 deals with concepts and definitions. Only those concepts and definitions are examined which are relevant to the integration of agricultural data with data from other sources, such as the concepts of "household" and "agricultural holding". Some definitions, which can be used when the household approach is adopted are suggested. However, these definitions are flexible enough to enable studying some particular aspects, according to countries' priorities, such as, for example, statistics on women in agriculture.

Chapter 4 deals with the integration of data within the framework of NHSCP and gives particular consideration to the problems which are likely to be encountered in the process of this integration.

Chapter 5 deals with the organization of data collection in the country. The relations between the Agricultural Statistics Department and the Central Statistical Office, especially where the Ministry of Agriculture is responsible for collecting agricultural statistics, are examined.

Chapter 6 examines the problems relating to sampling in an integrated survey programme.

Chapter 7 deals with conclusions and recommendations.

Finally, some appendixes are presented in Chapter 8.

CHAPTER II  
AGRICULTURAL STATISTICS

I. INTRODUCTION

Governments of the Member Nations of the Food and Agriculture Organization of the United Nations (FAO) have recognized the great importance of food and agricultural statistics in carrying out national and international programmes aimed at achieving the main objectives of the Organization, namely:

to raise nutritional levels and living standards, to improve the efficiency of agricultural production and the distribution of food and agricultural products, and to better the overall conditions of rural populations.

1. Needs for food and agricultural statistics

From the point of view of the economy, most developing countries are dependent on agriculture.

- It is the most important source of national income in most developing countries.
- The major proportion of their manpower in rural areas is engaged in agriculture.
- For many developing countries, external trade is dependent on agricultural products (export of agricultural products to cover needs for imports).
- It responds to the main human need: food.

It follows from the above that the social and economic development of countries, particularly developing countries, is rather closely linked with the agricultural development and that numeric data on food and agriculture constitute the cornerstone of development planning, the formulation of socio-economic policy and the definition of national priorities.

First of all, the Government agencies need those data for:

- i) the formulation of programmes and development plans
- ii) the monitoring of these programmes
- iii) the formulation of external trade policies (the harvest forecast is a key issue here)
- iv) the compilation of national accounts
- v) the formulation of an adequate agrarian reform policy
- vi) the building of road or irrigation networks, etc.

These data are also useful to international organizations. They enable them to:

- formulate regional programmes
- undertake long-term projections of regional and world demand of food and agricultural products
- advise Member Nations on programmes to be followed in order to meet the demand forecast.



In the private sector, mainly agricultural producers are interested in agricultural statistics. They concern themselves with agricultural commodities prices and current campaign production in order to have a strong position in the market.

Finally, private enterprises and businessmen are also interested in some data, namely statistics on the use of agricultural implements and machinery, fertilizers, pesticides, fodder and their regional distribution.

Food and agricultural statistics are therefore useful to various users.

However, in developing countries, government agencies are the main users of those data needed for planning agricultural development and, hence, general economic development of the country.

When considering the data needed for agricultural planning, the most important statistics that come to mind are those giving current levels of production of different agricultural and livestock commodities. Data on land use, area under crops and livestock numbers come next in importance. For the study of the structure of agricultural organization, one should know the number of holdings and their distribution by size, as well as their principal characteristics, such as tenure under which they are held, and farm population, with their age and sex composition and levels of education.

To indicate the resources that go into agricultural production, an assessment is needed of inputs such as seeds, fertilizers and chemicals, both farm-grown and purchased from outside, agricultural machinery and implements used on the farm, and the availability and use of irrigation facilities and other sources of water.

Agriculture contributes a major proportion of the national income in most of the developing countries. Reliable data on national income and agriculture's share in it, and the rates at which they are growing are needed. Data on financial outlays in the public sector and investments by the private sector in agriculture and allied sectors are equally important for agricultural planning.

Detailed statistics of institutional finance available through cooperatives, banks and other agencies are necessary to formulate further measures to increase its availability. For the same reason, information should be collected on foreign exchange accruing from exports of agricultural products and serving to cover needs for imports.

In order to estimate the quantities of crop and livestock products intended for household consumption, for local industries and for exports, different types of data have to be collected: current levels of consumption - broken down into calories, proteins and other components (to assess their nutritional value) - income elasticity of demand, growth of population, growth of per capita income, etc.

Development programmes for increasing agricultural output often take the form of measures to improve the quality of inputs by introducing new varieties (for example, paddy). When assessing the effect of these programmes on increasing production potential, one must have a yardstick for production; that is, one must know the yield per hectare of the local variety to find out the expected additional production per hectare from the exotic variety.

An important item of information needed for making the choice between several possibilities is the cost of different types of products and the benefits expected therefrom. Detailed data on input/output relationships are also needed to enable the farmer to make the right decisions in order to maximize the returns from the farm. Such data are often provided by farm management surveys. Responses of different crops to different inputs alone, and in combination, are also useful and can be obtained through properly planned trials in experimental fields.

In order to achieve rapid increase of agricultural output, and to ensure its equitable distribution among the different classes of rural population, institutional reforms involving land tenure are necessary. Desirable land reform varies from country to country and within a country from one area to another, depending upon the complexity of land tenure systems, population pressure, the productivity of the land and the political and social systems adopted. In order to assess the size of the problem in each area, and indicate the types of measures needed, information is required on the distribution of holdings according to land tenure; type of tenure (owned or in ownerlike possession); type of renting, i.e. for fixed rent in kind or cash, or share of the crop in kind or cash; ownership system; the extent of hereditary and transferable rights held on the land; etc. Most of the information is provided by the agricultural censuses. These characteristics often change very little from year to year, and therefore such data may be collected every five or ten years.

Among the other statistics needed are:

- market intelligence, dealing with data on marketable and marketed surpluses, prices, stocks, etc.
- data on retail prices, wages, and cost of living
- statistics on employment, under-employment and unemployment.

Data on agricultural employment enable a linkage between physical data on agricultural activity and socio-economic characteristics of the agricultural population.

Agricultural planning is made easier if detailed data, not only on existing land-use classification, but also on potential land use, existing groundwater possibilities, soil classification and fertility are available. Although they are useful for planning, they do not belong in the category of current agricultural statistics.

The needed precision of these different types of data and their periodicity depend on a variety of considerations, including the techniques of planning adopted. In a centralized state, national level data are usually adequate; but in a state with federal structure statistics are needed at the level of each of the constituent units. But where planning is done from below, the data will be needed for each of the lowest planning units: the village, the sub-district, etc.

While aggregate data at the national level will be adequate if collected every year, data on the lower geographical units can be collected on a quinquennial basis.

Table I gives a list of main data required on food and agriculture and their sources.

## 2. The scope of agricultural statistics

As can be seen, agricultural statistics cover a wide range of subjects and various numerical series can be compiled. However, these data can be sub-divided into two main groups:

- basic statistics
- current statistics

The first group refers to characteristics whose change is very slow from year to year (land use, number of holdings and their distribution...) and which reflect the structure of the agricultural economy of the country. They are usually provided by agricultural censuses.

Current statistics are data whose change is more rapid from year to year. They relate to agricultural activities that are almost continuous and repeated every year: planted area, production, credit, fertilizers used, etc. Current statistics are collected every year, and sometimes more often (e.g., characteristics subject to seasonal variations).

However, the difficulty of fixing a clear limit between these two categories of agricultural data should be pointed out. Depending on the country's economic conditions, some marginal items can belong either in the first or in the second group. For example, in a country where a permanent system of current data collection does not exist, yield statistics can be collected during agricultural censuses. However, in countries where agrarian reform is launched, in order to monitor the programme it will certainly be necessary to undertake successive surveys for collecting information on the tenure and distribution of land, and evaluate the efficiency of the programme.

## II. SOURCES OF DATA ON FOOD AND AGRICULTURE

The sources of data on food and agriculture can be classified into three groups:

1. Agricultural censuses
2. Agro-economic sample surveys
3. Other sources

### 1. Agricultural censuses

An agricultural census is a large-scale, periodic, government-sponsored operation for the collection and derivation of quantitative information about the nation's agriculture, using the agricultural holding as the statistical unit. The census of agriculture provides basic data relating mainly to the organization and structure of agriculture and to the use of agricultural resources, such as manpower, land, livestock, machinery, etc. In particular, the agricultural census is the principal statistical operation for obtaining the following essential types of data:

- (a) comprehensive and up-to-date facts on agricultural land area, harvests, irrigation, and numbers and kinds of livestock;
- (b) benchmarks for improving current estimates of crop areas and production and of livestock resources and products;

- (c) data on the structure of the agricultural sector and its changes such as by size distribution of holdings, extent of various forms of land tenure; agricultural resources; means of production, implements and practices, as well as measures of inter-relationships among these factors;
- (d) basic data regarding current use and changes in use of agricultural resources, such as manpower, land, etc.

The main advantage of complete enumeration censuses is that they provide data at the lowest administrative level. Therefore, they can provide an excellent frame for special surveys.

However, a complete enumeration census has some drawbacks:

- it requires an elaborate organization that can cover the whole country. The number of staff needed is then very large and, therefore, their level will be low;
- the operation is very expensive;
- since the number of enumerators is very large, the training will be less efficient and field operations control more difficult;
- non-sampling errors can therefore be so large that special measures have to be taken, unless the results become useless;
- finally, the data processing of this large quantity of information takes a very long time and also some important errors can be introduced.

## 2. Agro-economic sample surveys

These sample surveys may serve different purposes. In many developing countries they replace the complete enumeration census; in others, they supplement on a yearly basis the data collected through censuses. Other uses of sample surveys of this kind are pilot studies which precede the census, coverage checks, quality control, preliminary tabulations from census records, etc.

Agro-economic surveys cover a wide range of subjects and are often of a multi-purpose type.

Their use for collecting agricultural data through household surveys is the central subject of this manual. Details will be given later.

## 3. Other sources of data

Apart from censuses and agro-economic surveys, many other sources of data on agriculture exist.

Cadastral registers: are used, where available, as a main source of information on land use and area. These registers are useful sources of relevant data for monitoring changes in land tenure, which is an important topic in analysing the effects of agrarian reform.

Aerial photographs: The use of aerial photographs is becoming more and more important and aims at avoiding, or at least reducing, errors occurring in complete enumeration censuses. Many developing countries have tested this method, for example, Sierra Leone and Tunisia. But it should be pointed out that this method is expensive and its use depends on certain requirements which often are difficult to meet.

Community variables: For the purpose of land-use planning, emphasis has more recently been given to the collection of information on community variables at the village level. This information, usually stored on magnetic tapes in the form of village files, can provide valuable data on land use.

Topics usually contained in village files include number (or sometimes lists) of households, total population by sex, age and main occupation, area cultivated by crops, etc. Sometimes information on access to roads, health facilities, availability of drinking water, access to agricultural services, etc. is collected.

Administrative reports and/or records: These can be subdivided into two groups:

- producers' declarations
- reports from agricultural services or assessments

Producers' declarations: These are declarations prepared by producers for agricultural services. In developing countries, because of the frequent analphabetism in rural areas, this method is applied sometimes only for the modern sector and state farms.

Agricultural services' reports or assessments: In many countries, agricultural extension workers and agricultural agents report for every agricultural season on cultivated area, harvested area, estimated yield and production. These assessments are then adjusted and aggregated at district, regional and national levels. Although this method is purely subjective, it appears to be sometimes very useful in developing countries.

In some developed countries, such as the United States of America, information on production is provided by voluntary observers. This practice is not used in developing countries.

Table 1 - List of Main Data Required on Food and Agriculture  
and their Sources

Type of Data	Source
Population size and its breakdown into rural and urban by economic activity and sex	Population censuses and surveys
Agricultural labour force	Manpower surveys
Gross national product and its components - Production of food, crop and livestock products	Compilation of national accounts - Agricultural census; current agricultural surveys, livestock surveys and administrative records

Table 1 (Contd.)

Type of Data	Source
Import and export of agricultural commodities by quantity and value	External trade statistics
Growth rate of population	Population censuses and surveys. Vital statistics. Migration statistics
Urban and rural per caput food consumption levels.	Food balance sheets; household food consumption surveys
Income elasticity of demand	Time series of food consumption expenditures; family budget surveys
Price elasticity of demand	Time series of quantities purchased and price paid at retail and farm level. Household consumption and expenditure surveys
Nutritional levels	Food balance sheets; household food consumption surveys; nutritional surveys
Projection of world demand, supply and trade of agricultural commodities	Studies made by international and national agencies
Studies on national commodity situation and outlook	Current crop surveys. Records on surveys of crop arrival in markets. Farm and wholesale prices. Stocks at end of year. Foreign trade statistics. Cost of production surveys.
Land utilization and land tenure	Government records. Agricultural censuses. Special studies
Crop acreage and yield	Current agricultural surveys, statistical reports
Input-output relations	Controlled experiments conducted in selected areas, agricultural research stations and in cultivators' fields
Production function	Time series of production and estimates of input factors like land, labour and capital
Farm management	Farm management surveys
Studies on crop intensity, farm credit needs	Case studies. Sample surveys. Agricultural bank reports
Land use and production standards	Agricultural censuses and surveys

### III. ACTUAL PRACTICES IN DEVELOPING COUNTRIES FOR COLLECTING DATA ON FOOD AND AGRICULTURE

The FAO publication dealing with national methods for collecting data on agricultural statistics (10) gives a detailed description of actual practices in developing countries for collecting data on food and agriculture.

The importance of data collection in the field of food and agricultural statistics varies greatly from country to country, with regard to the objectives, the contents, and the periodicity. Although the means of obtaining data may vary from one country to another, there is a widespread method commonly adopted by countries, namely crop reporting through agricultural services supplemented, however, by sample surveys. These assessments usually relate to area sown, area harvested and production of the main crops. Ad hoc estimates of minor crops are worked out from the best information available.

Several developing countries make annual surveys to obtain current estimates on main crops production. Those surveys often include objectives measurements of acreage and yields.

Basic data on the agricultural structure are usually obtained through decennial agricultural censuses, within the framework of the world agricultural censuses programmes in which most developing countries participate. It should be mentioned here that only a few developing countries undertake a complete enumeration census. Most of the operations are on a random sample basis. But often a combination of complete enumeration and sampling methods is adopted: the modern sector is covered by complete enumeration, while the traditional sector is covered by a sample survey.

Basic data on livestock numbers and livestock products are generally collected through periodic surveys. Some countries undertake annual complete enumeration surveys, while others undertake only quinquennial censuses. Current statistics on livestock numbers and livestock products (milk, meat, eggs) are obtained through annual reports as by-products of government agencies in charge of livestock. However, periodic agricultural censuses and some sample surveys also give data on livestock numbers and products.

Several countries collect data on controlled slaughters through reports from slaughterhouses. It should be noted, however, that in developing countries, particularly in Africa, non-controlled slaughters of some animals are considerably higher than controlled slaughters, and therefore these data become useless.

From time to time, several countries conduct general economic surveys in the sphere of agriculture. More important among these ad hoc surveys are:

- household income and expenditure surveys
- cost of production surveys
- food consumption surveys
- nutrition surveys
- farm credit and indebtedness surveys
- market arrivals surveys
- distribution and stocks of certain special commodities
- survey of prices received and prices paid by producers
- employment and labour force surveys.

In some countries, farm management surveys are also undertaken in specified regions or areas.

However, all those surveys were carried out on an ad hoc basis with a separate budget and specific objectives, to cater for the most urgent needs. On the other hand, they are executed by different agencies, without coordination of data collection activities.

Besides these surveys, a number of methodological pilot studies are carried out in different countries, in addition to a number of diagnostic, evaluative, or other agro-economic studies undertaken with specific objectives, and often with restricted geographical coverage.

Two case studies of agricultural data collection organization in two developing countries, the Republic of Mali and the Republic of Uganda, are presented in Appendix I.

#### IV. USE OF HOUSEHOLD SURVEYS FOR COLLECTING DATA ON FOOD AND AGRICULTURE

As already mentioned, some important aspects of the agricultural statistics are covered by some types of household surveys. These data, which do not change greatly over time, can be considered as basic statistics.

The main concern in the present section is the use of the "household approach" for collecting current agricultural statistics. In other words, the present section deals with the integration of agricultural surveys in national household survey programmes.

There are many reasons for this integration, the more important of them being:

- (a) The household sector plays a key role in the economic development of the developing countries. As a matter of fact, households in developing countries are both production and consumption units. On the other hand, almost the total population in rural areas is employed in agriculture. Thus, collecting data on traditional agriculture is equivalent to collecting data on agricultural households. In developing countries it would be difficult to conceive of some types of surveys, such as income and expenditure surveys, employment surveys, social conditions surveys or household economic surveys, without taking into account agricultural activities and income. This has led some developing countries, for example, Rwanda, to merge the income and expenditure survey in rural areas with the agricultural survey.
- (b) In order to be able to collect information about the holding, it is often necessary to contact the holder. There are different ways to identify the holder.

One method is to first identify the land for which information has to be collected. This can be done on the basis of geographical maps or aerial photographs. The second step is to find out who operates this land. This approach is used in some countries (for example, Tunisia) when using the area sample method.



A much more widespread method of identifying the holding in the traditional sector of agriculture in developing countries is approaching the holder through his household. Lists of households are prepared or are already available from a previous household survey or from a population census.

This second approach indicates that the household appears to be the normal way for studying the traditional agricultural sector in developing countries. This fact is put in a prominent place in census and survey reports from developing countries. In these census and survey reports, it can be found that many developing countries (for example, Liberia, Niger, Upper Volta, Senegal) report the concept of holding. It is tacitly assumed that the holding is the reporting and tabulation unit. However, in examining the field instructions for the interviews, one finds that in many cases the reporting and tabulation unit is the farming household or the extended family and not the holding. Moreover, the listing operation in those countries starts with the list of households from which farming households and non-farming agricultural households are identified.

- (c) Generally, for agricultural censuses, a minimum size of holding is fixed. Holdings below this limit are not covered in the censuses and surveys. By this restriction the census cannot provide information on some categories of population such as the smallholders or the landless agricultural households. Information on these categories of population becomes very important in studying the poverty in rural area and in formulating policies on agrarian reform. These issues can be covered through households.

Therefore, as far as the traditional agricultural sector is concerned, many relations do exist between the household and the agricultural holding. It is thus possible to give a definition of a holding using the household approach. That is the strategy adopted in this manual. But before we build such a definition we shall first review the classic definitions of a household and a holding.

### CHAPTER III

#### CONCEPTS AND DEFINITIONS

The main concepts and definitions used in agricultural census and surveys are given in many reference books listed in the annex to this manual, particularly in the "Programme for the 1980 World Census of Agriculture" (1). Here we will be dealing only with those concepts and definitions relating to household and holding in order to bring to light linkages existing between both concepts in developing countries, and, in doing so, arrive at a definition of holding through household.

#### I. CONCEPT AND DEFINITION OF HOUSEHOLD

Although it is a common understanding that household is a suitable reporting unit, it is not the same thing with its definition. Not only may it vary from country to country, but it may even vary within the same country, from one region to another, according to the survey objectives.

The definition adopted by the United Nations for the Census Programme is as follows:

The concept of "household" is based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. A household may be either: (a) a one-person household, that is, a person who makes provision for his own food or other essentials for living without combining with any other person to form part of a multi-person household, or (b) a multi-person household, that is, a group of two or more persons who make common provision for food or other essentials of living. The persons in the group may pool their incomes and have a common budget to a greater or lesser extent; they may be related or unrelated persons, or a combination of both.

Households usually occupy the whole, part of, or more than one housing unit, but they may also be found living in camps, in boarding houses or hotels, or as administrative personnel in institutions. Households consisting of extended families which make common provision for food, or of potentially separate households with a common head, resulting from polygamous unions, may occupy more than one housing unit (15). However, the authors of the manual, desiring to simplify the definition, suggested a shorter definition; namely, "The household is a group of persons, related or unrelated, who live and eat together".

The search for simplicity and the attempt to explain to the field staff what is meant by "living and eating together" led to variations in the operational definitions adopted. A few examples will illustrate the point.

- (a) A survey in Jamaica used the following definition: "a group of people who live together and draw from a common fund for all their major items of expenses ..., a servant or other domestic help who sleeps on the premises (even in a separate building) and shares meals with his employers ... is considered a member of the household". (11)
- (b) A budget survey in the Bahamas defined a household as: "those persons living together under one roof and are organized as a single unit for budgeting and consumption purposes and for purposes of providing themselves with food and other domestic arrangements". (12)
- (c) In Kenya, several definitions have been tried. The 1974 National Integrated Rural Sample Survey used the following definition: "a person or group of persons normally living together under one roof or several roofs within the same compound or homestead area and sharing community of life by their dependence on a common holding as a source of income and food, which normally, but not necessarily, involves them in eating from a 'common pot'". (13)
- (d) The Philippines have adopted a shorter form: "a group of persons who live together under the same roof and share the meals". (14)

These examples highlight the three criteria of belonging to a household, namely:

- (a) The idea of roof: household members should share the same common housing unit that may be a house or a compound.

- (b) The idea of common meals: the household members should have common eating arrangements.
- (c) The idea of a common source of income: household members should pool part of, or all, their income for providing themselves with food and other essentials.

Generally, the definition adopted for a household should take into account the social organization of the country, especially in countries where polygamy is frequent.

A group of persons, including a husband, his wives and their children, is usually considered as a unique household, even if each wife has a separate house within the compound, with her children, cultivates her own portion of land, and has her own eating arrangements with her children independently of other wives.

## II. THE HOLDING

Definition: The international definition of a holding is as follows (1): " a holding, for agricultural census purposes, is a techno-economic unit of agricultural production comprising all livestock kept and all land used wholly or partly for agricultural purposes and operated under the management of one person or more, without regard to title, legal form, size, or location. The holding as a techno-economic unit under a single management generally has the same means of production, such as labour, farm structure, machinery or draught animals".

Holdings operated by a civil person or persons (one or more individuals or one or more households) have very different characteristics from those operated by a juridical person (that is, corporation, cooperative, collective, etc...). Moreover, it is also found that the characteristics of holdings operated by juridical persons may still differ widely according to the type of juridical person. Thus, it is useful to subdivide agriculture into a number of sectors. The methods and the questionnaires used for collecting data may differ from one sector to the other. Two types of classifications may be envisaged. One is based on the authority managing the holding and the other on the importance of the holding.

### Agricultural sectors\*

#### 1. Private, public and collective

A reasonably simple classification would be to subdivide the holdings into the following sectors:

- (a) The private sector, comprising all holdings operated by individuals or households;
- (b) The public sector covering holdings operated by a central or local government, either directly or through a special body;
- (c) The collective sector covering holdings operated by a group of persons who voluntarily, or by mandate of the government authority, join together to exercise land rights in common. However, if a

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\* cf. Reference No. 2.

member of a collective receives a plot for his own personal use, this plot will be part of the private sector.

## 2. Modern, progressive and traditional

Another classification of agricultural holding is based on the importance of the holding and the degree of utilization of advanced agricultural techniques. In this classification, the holdings are subdivided into: modern, progressive, and traditional.

Holdings in the modern sector (sometimes called estates, agricultural establishments or simply large farms) have to conform to certain recognized criteria. These criteria are based on:

- size of the holding: above a certain fixed limit;
- destination of the products: for sale;
- labour inputs: extensive use of machinery and equipment;
- organization: keeping records of activities, inputs and outputs.

Holdings in the progressive sector conform to some of the above criteria, but not all. They are of a moderately large size, they produce mainly for sale but some of the produce is for home consumption and some mechanization and modern agricultural techniques have been introduced in the operation of the holding.

Holdings in the traditional sector are generally small in size, produce mainly for home consumption, do not employ, or only occasionally employ, paid labour, and use simple agricultural implements.

From the above classifications it is clear that, in developing countries, the traditional private sector is the most important and employs, generally, more than 80 percent of the total active population. Indeed, the primary purpose of production in the traditional sector is the auto-consumption, i.e. the subsistence economy. But it is also in this sector that in developing countries, owing to the social organization based on the family or household, the application of the classic definition of holding often raises some problems, mainly when one has to identify the holder, i.e. the person who exercises management control over operations of the agricultural holding, takes the major decisions regarding the utilization of the available resources and has technical and economic responsibility of the holding. In developing countries an "economic organization" is the result, for a given society, of the combination of two factors: a general parenthood system which gives all the latitude to social participants to take best advantage of the possibilities offered by that system, on the one hand, and, an economic system, which itself results from the ecology, the history and some fundamental rules relating to the organization of the production and the sharing of the products, on the other hand. This economic organization provides the "economic morphology"\* of a society. In order to describe this "economic morphology", it is necessary to examine three fundamental economic phenomena, common to all societies, and from which all the others derive: the production, consumption and accumulation (here we consider essentially means of production such as draught animals, agricultural machinery, etc.). Moreover, in rural societies from developing countries, particularly in Africa, the term "community" seems to be more suitable than "unit" because it emphasizes the privileged exchanges that

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\* By analogy to the "social morphology" described by MAUSS in "Sociologie et Anthropologie" PUF-Paris 1973.

bind persons from the same group. It is therefore necessary to define three fundamental communities:

- (a) The production community, perceived as a group of persons who contribute to the creation and the supply of products;
- (b) The consumption community, perceived as a group of persons who participate in the consumption of a part of the product in order to rebuild their physical strength;
- (c) The accumulation community, perceived as a group of persons who pool the surplus obtained after the consumption of a part of the product.

The field experience reveals that there is a fourth community that, by itself, has no economic purpose, but which is indispensable to identify when one intends to define the preceding communities: the residence community, perceived as a group of persons who share the same dwelling unit, separated from the others by a visible boundary (wall, wooden fence, etc.). Indeed, this geographical space, easily recognizable in the field, will often permit a better understanding of the other communities which are an integral part of it.

In the traditional ambience in developing countries, it is precisely those four functions which determine household: a group of people living together in the same dwelling unit and organizing themselves together for the production and consumption of food, through autoconsumption, and pooling the surplus obtained after the consumption for accumulation; all this under the authority of the head of household who takes all major decisions at all levels.

Indeed, within a household in a traditional environment it is possible that a decision is taken at many levels, but there is always a main decision centre, i.e., the head of household. A member of a household, other than the head, may operate a piece of land independently of the head, but when it comes to the disposal of the produce, the underlying responsibility of the household head emerges. The household head may not take day-to-day decisions about the operation of part or all of his holding because he is satisfied with the way his household members are acting on his behalf. He would interfere if he became dissatisfied with the operations carried out. Thus, he delegates his technical authority to some household members, who, in fact, perform their task under his supervision, and reserves for himself the major decisions. Therefore, the traditional household should be defined through the household.

We propose the following definition which seems, to us, more operational: "All land used wholly or partly by a household for agricultural production, and all the live-stock kept, and being managed as a single economic unit under the overall control and direction of the head of the household, considered as the holder".

Such an approach has already been used by some developing countries (Fiji, Lesotho, Malawi, Togo). (17)

In traditional areas of developing countries, and particularly Africa, almost all holdings defined as above will be owned or held in ownerlike possession by holders.

It should be pointed out here that this approach attaches more importance to the notion of farming household than the one of holder. From this fact it will be possible to collect, at the same time, both information on the holder and the "demography" of the holding.

However, it is always possible to bring to light the agricultural activities of some categories of population, such as women's activities, in order to assess the women's participation in development. Two approaches can be used:

- (a) Division of labour: in most developing societies there exists a division of labour between various categories of household members. For example, in some societies the husband takes care of permanent crops, while the wife takes care of staple food production. It is therefore possible, once the characteristics of the holding are known, to assess the wife's participation in the activities of the holding.
- (b) Field lists: in developing countries it is usually necessary to set up a list of fields, parcels, etc. of the holding. It is then possible, when setting up the list, to identify which household members are directly responsible for the field or parcel. When processing the data, a code may permit distinguishing fields or parcels for which various categories of household members are directly responsible.

This "household approach" presents many advantages:

- (i) There is a similarity between a holding and a household. Therefore, all data provided by an integrated survey programme will relate to the same homogeneous unit, the household, on which many types of information will be available: data on agriculture and those from other sources. All those data can therefore be integrated and better describe the household as a homogeneous economic and social unit.

Moreover, this similarity leads to a one-to-one correspondence between the farming household and the holding, i.e., to each farming household will be attached one and only one holding and vice versa. Indeed, if care is taken in the identification, most rural households will be found to contain only one holder. Most of the households that appear at first sight to contain more than one holder will, on further examination, usually be placed in the simpler category. In some rare cases, where the presence of two holders seems to be clearly established, the household may have been defined incorrectly; what was listed as a single household is, in fact, two - with one holder in each.

FAO, in describing and explaining the definition of a holder, states: "agricultural operations carried out and commodities produced by different members of a household will normally be sufficiently pooled so that there is only one holder ... it will usually be necessary to determine one holder in each household in many of the developing countries". (1)

The opposite case occurs when two or more households jointly operate a single holding. Such a situation, which is not frequent, obviously occurs when the holding is inherited. Generally, in this case the social organization of the society confers to one of the household heads some traditional authority. This household head should then be considered as the holder. In the case of non-related people who organize themselves together to operate a single piece of land, the solution adopted would differ from the previous one: the joint operation should be

treated separately in terms of enumeration and tabulation. However, this situation is rare in developing countries. Therefore, some countries consider such holdings as normal, and one of the co-holders is taken as the main holder.

The last case to be considered here is the community holding which exists in some countries e.g., Tanzania . This type of holding should be treated separately, as a distinct category.

- (ii) There is a close link between the holding, as a production unit, and also income unit, and a household as the consumption unit. This link allows not only a better integration of data from an income, expenditure and consumption survey, but also a possible simultaneous execution of both types of surveys.
- (iii) From the sampling point of view, it is possible to use a list of households as a sampling frame. This procedure eases the sampling work, since it will be possible to use as a sampling frame a list of households from a previous survey or a population census. On the other hand, it is easier to set up or update a list of households than a list of holdings.
- (iv) Up to now an artificial distinction had been made between agricultural surveys and other surveys because, in the first one, the reporting unit is the holding and, in the second one, the reporting unit is the household. The similarity that is described now between both reporting units should lead to an easier coordination of surveys and to the implementation of coherent data collection systems.

In conclusion, we can state that this approach facilitates the implementation of integrated survey programmes.

#### CHAPTER IV

##### THE INTEGRATION OF DATA WITHIN THE FRAMEWORK OF NHSCP

The document "Development of an Integrated Programme of Household Surveys: A Review of Major Issues" (18) presents the meaning and the objective of integration within the context of NHSCP. According to Webster's dictionary, the definition of integrate, as it is used here, is "to form a more complete, harmonious, coordinated entity, often by addition or arrangement of parts or elements". If this definition is applied to household surveys, each question asked in each survey must be considered as an element to be added to others or to be arranged with others to build a whole. Likewise, the surveys themselves must be considered as parts to be added to others or to be arranged with others with a view to obtaining a harmonious and coordinated survey programme. The survey programme itself should be seen as a component of the country's statistical programme.

Therefore, the term "integration" applied to household surveys is multi-dimensional. Firstly, at the level of concepts, definitions and classifications relating to data on various subjects covered by the programme, integration means that the concepts, definitions and classifications used are the same or, at least, compatible. The one-to-one correspondence that would exist now between the household and the traditional holding

would fulfil this requirement. Secondly, integration supposes that various surveys of the programme relate to the same population, a requirement which the present approach will enable them to meet. From the organizational point of view, integration supposes that the organization and field execution of different components and surveys of the programme are coordinated to achieve economy of effort and means. Finally, concerning sampling, integration supposes that all the surveys are based on the same sample. Surveys will be considered as fully integrated if they are based on the same sample of dwelling units, same households and same persons; in the case of a multi-stage sample, as is often the case, surveys will be considered as partially integrated, i.e., they are based on the same primary sampling units (PSU). The household samples may then be different.

The household approach enables the integration of agricultural surveys in national household survey programmes. It is therefore necessary to envisage the arrangements which should be made in respect to data collection organization and sampling.

## CHAPTER V

### DATA COLLECTION ORGANIZATION

Previous chapters stressed the need of integrating the collection of data on the traditional sector of agriculture in national integrated survey programmes in developing countries. Until recently the collection of all statistical data, including agricultural statistics, was the sole responsibility of the Central Statistical Office (CSO). But now, most of the developing countries, owing to the importance of agriculture and live-stock in the economy, have established an independent agricultural statistics service, usually located in the ministry in charge of agriculture and livestock. Nevertheless, the Central Statistical Office justly remains in charge of coordinating statistical activities, in general, at the national level, and is often responsible, within the framework of NHSCP, of the execution of survey programmes. It is therefore necessary to define the relations that should exist between the service in charge of agricultural statistics and the other statistical services, especially the Central Statistical Office. These are the aspects the present chapter is dealing with.

The organization of the agricultural statistics services varies greatly from country to country, often according to the level of statistical development of the country.

In the field there exists various types of agricultural data collection. In a number of developing countries the Central Statistical Office still remains in charge of collecting, analysing and publishing all statistical information, including agricultural statistics. Other countries have established a distinct service in charge of agricultural statistics. The level of development of their service varies greatly from one country to another. Indeed, in some of these countries, the service in charge of agricultural statistics has very limited responsibilities, while in others it is a completely independent service with considerable means in personnel and equipment.

Whatever the type of organization and the level of development of the service in charge of agricultural statistics, some special relations should exist between the Central Statistical Office and the Ministry of Agriculture, especially the service in charge of agricultural statistics. However, only aspects relating to the collection of agricultural data through household surveys within the framework of NHSCP are examined here. Relations on the methodological plan and on the field of survey organization will be examined.



## I. RELATIONS IN THE METHODOLOGICAL PLAN

### 1. Objectives, data collected and integration of data

As stated above, a continuous survey programme aims at integrating different variables in order to describe and explain human behaviour. Consequently, there is an interdependence among the different variables of an integrated survey programme and even of the overall statistical programme of a country. This fact must be taken into account in defining the survey objectives and in selecting data to be collected. It must be borne in mind that other more detailed data on certain variables will be collected in other parts of the programme. The problem, therefore, is to limit the objectives and the level of detail of the data collected in order to avoid duplication with other parts of the programme.

Nevertheless, the agricultural survey has to provide sufficiently detailed information to be used, for example, as stratification criteria for other surveys, or even to orient research, in the context of those surveys, in a particular direction. The major problem here is the one of finding a happy medium in the determination of the survey objectives.

One of the possible solutions would be to decide on the objectives and the data to be collected for each of the programme's surveys, separately but simultaneously. The comparison of the various objectives and data to be collected together with the desired level of detail would point out any duplication and place the objectives of each of the surveys in proper perspective with the others.

For the agricultural component this task should be done by the Ministry of Agriculture. Indeed, this Ministry, and especially the service in charge of agricultural statistics, when it does exist, remains the main user of data collected. Therefore, it should be its task to clearly formulate its needs of statistical data. The service in charge of agricultural statistics should strive to define, for each item of information needed, some important elements such as type of information, level of detail needed, use of the data, etc., and collaborate closely in the elaboration of the survey questionnaire in case the survey is undertaken by the Central Statistical Office.

### 2. Concepts, definitions and classifications

Integration, as applied to household surveys, takes place at several levels. First, at the level of concepts, definitions and classification relating to statistics on various subjects from the same survey or from different surveys, integration would mean that the concepts, definitions and classifications are the same or are at least compatible. The concepts, definitions and classifications to be used for the agricultural survey should be, if not the same, compatible with those that are used, or will be used, in other surveys of the programme. This is the case of concepts and definitions such as household, holding, manpower, occupation, residence criteria, etc. Here again a solution to this problem would be to consider the programme as a whole and proceed as suggested above for the objectives.

The service in charge of agricultural statistics must be closely associated with this task whenever it is not itself executing the survey; otherwise, it must do this part of the work in close collaboration with the Central Statistical Service. This collaboration will let the personnel of the agricultural statistics service not only know the contents of various concepts and definitions, but also ensure their appropriateness for studying the rural area.

### 3. Sampling

As will be seen later on, the best stratification criterion for agricultural surveys is the agro-ecological zone. In fact, the definition of these zones is the responsibility of the Ministry of Agriculture. More details on this aspect will be given in Chapter 6 dealing with sampling.

## II. FIELD ORGANIZATION

Owing to the importance of agriculture in their economy, most developing countries participating in NHSCP have included current annual surveys of agriculture in their programmes. In most cases, a team of permanent interviewers has been recruited for the execution of various surveys of their programme.

The Ministry of Agriculture should have a key role in the execution of the agricultural surveys, in giving appreciable assistance to the field staff in the realization of that operation. Indeed, the extension staff, who generally live in the area they supervise and are well known to the holders, may facilitate interviewers' work, for example, in showing them the area, introducing them to the holders, and in assisting them in the construction of the sampling frame and field lists of the sample households, etc. Such a collaboration has several advantages. The survey will benefit from the extension personnel's knowledge of the field and experience. On the other hand, such a procedure will cancel any susceptibility on the part of the holders, the extension worker's presence constituting a type of security for them.

Sometimes, because of the heaviness of various programmes, this team of permanent interviewers is not sufficient to carry out all the surveys of the programmes. At that time it would be advisable to use the extension staff as interviewers and supervisors for the agricultural survey. In that case the survey methodology should be prepared jointly by the Central Statistical Office and the Agricultural Statistics Service. The field work will be the responsibility of the Ministry of Agriculture, under the technical supervision of the Central Statistical Office.

The use of agricultural extension personnel as field staff for the agricultural surveys has, as will be seen below, some fundamental advantages and should therefore be encouraged and generalized.

## III. ADVANTAGES IN USING EXTENSION PERSONNEL AS FIELD STAFF FOR THE AGRICULTURAL SURVEY

The use of agricultural extension personnel as field staff for the agricultural survey presents many advantages. Among the most important are the following:

### . The permanence of the field staff

Generally, the best way of gaining survey experience is to participate in many of them. Such a possibility is usually given only to permanent staff. The extension personnel, as permanent staff of the Ministry of Agriculture, may participate in many surveys and gain important experience. On the other hand, the use of that personnel will reduce survey costs. Indeed, this personnel, as permanent personnel, is already on the payroll and only some additional allowances will be necessary. This will reduce substantially the personnel costs. Likewise, to perform their regular tasks, this personnel is already provided with some means and equipment. For the survey it will be necessary to strengthen them. This will also reduce some of the survey costs. It would then be possible to undertake the agricultural survey with a reduced budget.

It is obvious that the size of the sample will differ for various surveys. It will be different, for example, for an agricultural survey, an income and expenditure survey, or a demographic survey. Likewise, because of intraclass correlation, the cluster sizes will also differ. For example, clusters of three to five farming households will be sufficient for an agricultural survey, while for a demographic survey clusters of larger size will be needed.

A solution often adopted to resolve this problem consist of determining an optimum size of the total sample and clusters, taking into account interview and transport costs. But doing so, the degree of precision and accuracy will automatically differ for various types of surveys. For some surveys the number of observations will enable only a low degree of precision, while for others the number of observations will be too high for the desired degree of precision.

In order to attenuate this drawback, another procedure, slightly different from the above, could be used: determining, on the basis of survey costs and desired degree of precision, an optimum sample size for each of the surveys of the programme. The sample for the survey necessitating the larger sample size will then be considered as the basic sample. For the other surveys, sub-samples will be selected from that sample. This procedure, already economic as regards costs, also presents the advantage of making the integration of data from varous surveys of the programme easier.

## CHAPTER VII

### CONCLUSIONS AND RECOMMENDATIONS

Because of the importance of agriculture in their economy, most developing countries organize periodic censuses of agriculture.

However, agriculture of those countries presents a particular characteristic: there is an embryo of modern sector and a preponderant traditional sector. It is therefore recommended that in the censuses the modern sector be covered by complete enumeration, while the traditional sector be covered by a sample survey.

The traditional sector, or subsistence agriculture, is an attribute of households. Almost the whole population in rural areas is employed in this sector. Thus, collecting data on traditional agriculture is an activity equivalent to collecting data on households. It is for this reason that in most censuses and surveys in developing countries holdings in traditional sector are identified through households using a list of households. In fact, the household approach appears to be the normal procedure for studying the traditional agricultural sector in developing countries. Therefore, as far as the traditional agricultural sector is concerned, many relations exist between the household and the agricultural holding. It is therefore possible, and even desirable, to study the traditional agricultural sector through households. From that point agricultural surveys on the traditional sector, i.e., on almost the whole agricultural sector of developing countries, can be integrated in a national household survey programme. However, for realizing this integration some important problems should be resolved.

#### 1. Observation units

The first of these problems is the one of observation units. While for other types of surveys in the programme the observation unit is a household, for the agricultural survey the observation unit is an agricultural holding. But in the traditional sector, a household is at the same time a production, revenue and consumption unit.

In order to resolve the problem of observation units, a strategy is recommended consisting of defining a traditional agricultural holding through household. The following definition could be adopted: "The land used entirely or partly by a household for agricultural purposes including all livestock kept, and being managed by the head of household, considered as the holder".

The similarity that would then exist between an agricultural holding and a household would enable:

- (a) establishment of a type of one-to-one correspondence between the farming household and the holding;
- (b) integration of data provided by different surveys of the programme because they will all relate to the same unit, i.e. the household, better described in that way as a homogeneous economic and social unit.

However, those data will often be only partially integrated since surveys will generally be based only on the same primary sampling units and not necessarily on the same dwelling units and households.

## 2. Sampling

For integration of data sampling design plays a very important role. However, many problems may arise.

- (a) Type of sample: One of the major objectives of NHSCP is the planning and organization of continuous programmes of series of integrated surveys on a wide range of subjects. However, because of a particular aspect of data collected in agricultural surveys, as compared with the other programme components, there is a temptation to adopt for the agricultural surveys a distinct sample, independent of those used for the other surveys of the programme. This approach has, in the context of an integrated survey programme, some drawbacks, among which one of the most serious is that because of independence of the samples, such a procedure makes it difficult to integrate data from various surveys. It is therefore recommended, in the context of a programme of integrated surveys, to adopt a master sample.

On the other hand, in a survey programme including many surveys, the use of a master sample will raise some problems, such as:

- (b) Primary sampling units (PSUs): Because not all developing countries have yet undertaken a population census, many agricultural surveys undertaken up to now had adopted a village as a PSU. This practice has some drawbacks related to imprecision of boundaries, village toponymy, and the variation of size of villages.

Most developing countries have, by now, completed at least one population census. For this census the national territory has been divided into EAs, and it is recommended that the exhaustive list of these EAs be adopted as primary sampling units.

- (c) Stratification: An important phase in the selection of a sample of the population is the stratification, particularly in cases on nationwide surveys as is usually the case in the context of NHSCP. Because data collected in an agricultural survey are somewhat specialized as compared with other surveys of the programme, this stratification will also raise some problems.

- (i) Stratification criteria: The administrative region is a stratum suitable for many types of surveys and convenient for government authorities to orient their decisions, but is unsuitable for agricultural surveys. For these surveys the agro-ecological zone is a more suitable stratum.

The division of national territory into EAs has usually been made independently for each subdistrict. The subdistricts are homogeneous units with respect to climate, agriculture and ethnic group, belonging to one, and only one, agro-ecological zone. This is also true for EAs.

Therefore, it is possible to classify various subdistricts, and also all EAs, into agro-ecological zones.

It is recommended that every administrative region be divided into urban and rural areas. In each region the urban area can be classified according to size of population or according to economic importance, and the rural area is stratified according to agricultural or agro-ecological conditions. Master sample formed as described above will enable one to obtain reliable and more accurate data, both for administrative regions and for agro-ecological zones.

- (ii) Sample and cluster size: In an integrated household survey programme, sample size will differ for various surveys. Likewise, because of intraclass correlation the cluster size will also differ.

The solution often adopted to resolve this problem consists of determining an optimum size for the sample as a whole and for clusters, taking into account the cost of interview and transportation. In doing so, the degree of precision and accuracy will automatically differ for various surveys.

In order to alleviate this drawback it is recommended that one determine an optimum sample size for each of the surveys of the programme, taking into account survey costs and desired precision. The sample survey necessitating the larger size will then be considered as the basic sample from which sub-samples will be selected and used as a sample for other surveys.

Apart from those methodological problems, integration of agricultural survey in the national household survey programme raises some problems in the field of data collection organization and, more particularly, with regard to determining objectives, concepts, definitions, and classifications.

Objectives and information to be collected: a continuous survey programme aims at integrating different variables in order to describe and explain human behaviour. Consequently, various variables of a programme are interdependent. Because of this interdependence, the objectives and information to be collected for each of the surveys should be limited, taking into account the fact that more detailed data on some variables will be collected in other components of the programme.

In order to establish a balance between objectives, data to be collected and the degree of precision of various variables of each of the surveys, it is recommended that elements be decided on separately but simultaneously. The comparison of the various objectives and data to be collected, together with the desired level of precision, enables one to avoid duplication and balance the objectives of each of the surveys in proper perspective with the others.

Concepts, definitions and classifications: In order to facilitate integration of data on various subjects from many surveys it is important that concepts, definitions and classifications used for agricultural surveys be at least compatible, if not the same, with those used or which will be used in other surveys of the programme.

Here again it is recommended to consider the programme as a whole and proceed as suggested above for the objectives.

APPENDIX I

EXAMPLES OF ORGANIZATION OF DATA COLLECTION FOR AGRICULTURE

GHANA

The Central Bureau of Statistics (CBS) in Ghana is responsible for collecting all official statistics. However, responsibility for collection of official statistics can be entrusted by the government statistician to some government institutions within their domain of activities. In application of this rule, responsibility for collection, analysis and publication of agricultural statistics in Ghana had been entrusted by the government statistician to the Department of Economic Research and Planning Services (ERPS), Ministry of Agriculture.

Agricultural data collection in the Ministry of Agriculture

As stated above, the ERPS is responsible for collecting agricultural data. The following sections are involved in this activity:

1. Farm management section compiles information on inputs used by farmers. It intends to organize, in 1984, in collaboration with CBS, a National Farm Household Economic Survey.
2. Statistics section undertakes a Permanent Agricultural Survey (PAS) every year. This survey constitutes the main agricultural data collection activity of the Ministry of Agriculture. Moreover, this section is preparing to undertake an agricultural census in 1984.

Some important features of the Permanent Agricultural Survey

Coverage and scope: The permanent agricultural survey is nationwide. It covers all private holdings, whatever their size. State farms are excluded from the scope of the survey.

Survey period: The survey period corresponds with the agricultural campaign.

Survey content: The central part of the survey is the intention of farms for the agricultural campaign: number of fields, crops to be planted, etc. Later on, no matching is made between the farmers' intentions and realizations for the campaigns.

Field organization: The ERPS has created a regional office in each of the regions. Each of the regional offices has permanent field personnel (supervisors and interviewers) at its disposal whose only task is the undertaking of the annual survey. This personnel is different from agricultural extension personnel. The total number of this permanent personnel is about 500. All survey operations are carried out by regional offices and later on all documents are forwarded to the head office at Accra where they are processed and analysed. Until recently, ERPS had a contract with the Cape Coast University for data processing. But recently FAO supplied ERPS with a mini-computer, Wang 2200, which is now operational and used for processing survey data.

Role of the Central Bureau of Statistics (CBS) in the survey: As stated above, the government statistician has delegated authority to some government agencies, such as the Ministry of Agriculture, to collect official statistics. But all organizations outside the CBS are independent. They organize everything themselves and execute the work. No contact with the government statistician is required.

Therefore, CBS is not involved at all in this agricultural survey and the result is that there is no coordination of data collection activities in the country.

### Concepts and definitions

As stated above, CBS does not coordinate data collection activities, nor is it involved in technical conceptualization of surveys. Consequently, it is not in a position to impose concepts and definitions to be used on various agencies. Every agency may adopt its own definitions. However, most of the agencies try to use the household definition adopted for the Population Census Office of the CBS.

### Definition of household adopted by the Population Census Office

The definition adopted by the Population Census Office is as follows: "the term 'household' may be defined as a group of persons living together and having a common eating arrangement". It should be noted here that the definition used takes into account two important criteria in defining a household: same housekeeping arrangements and catering for essential needs.

For the agricultural survey, the definition adopted is as follows: "the term 'household' means the persons generally bound by ties of kinship who normally reside together, but not necessarily under the same roof. This includes the holder himself, who must be entered on the first line of the list, the relatives living with him, and other persons who share the community of life with the holder".

### Definition of a holding

Because the CBS is not involved in agricultural data collection, this office has not adopted any definitions of a holding. Only the one adopted by the Ministry of Agriculture can then be considered as official.

"A holding, for the purpose of the survey, is all land that is used by the holder completely or partly for the purpose of agriculture (including grazing land other than communal grazing). Livestock owned by the holder, even though he has no land, is to be regarded as a holding... .

"Land owned by the holder, but which he has loaned or rented to people outside his household, should not be included in the holding. The holding is all the land that the holder and the members of his household are operating

The last part of this definition shows that the household approach is implicitly adopted in this survey.

### Sampling

The sample of villages, which is now being used, was selected in 1966. This sample is obsolete and should be renewed. (See the questionnaire and field documents used for this survey in Appendix.)



## MALI

The collection of agricultural data through censuses and surveys is the responsibility of the Direction Nationale de la Statistique et de l'Informatique (DNSI) attached to the Ministry of Planning. It is in this context that DNSI is also responsible for the organization of the Permanent Agricultural Survey (PAS).

However, many sections of the Ministry of Agriculture execute, for their own needs, some specific enquiries:

1. The "Division des Etudes Techniques" undertakes socio-economic enquiries for studying project factibility and feasibility.
2. The "Division d'Evaluation et Planification" undertakes some project follow-up studies.
3. The "Division de la Recherche sur le système de Production Rurale" undertakes some agricultural research enquiries. These enquiries are mainly of a socio-logic and economic nature.

But in the Ministry of Agriculture the most important survey remains the Agricultural Holdings Follow-up Survey, common to the three sections above. It aims at identifying economic, physical and social constraints at the agricultural holdings level, in order to formulate proposals. This survey covers the following aspects:

1. Technical aspects: yields from the field and study of how to improve it (fertilizers, etc.), labour time, etc.
2. Agricultural income aspect: budget of the holding (input-output balance sheet), consumption of harvested agricultural products.
3. Agricultural population: the reporting unit is the holding, which is defined using a decision centre approach.

### The Permanent Agricultural Survey in its present form

1. Coverage and scope: The Permanent Agricultural Survey (PAS) covers the whole national territory except the desert Grand Nord. However, the PAS covers only the non-structured sector, i.e. areas which are not covered by state farms and development missions. Therefore, this survey covers only the traditional sector. Information on state farms and development missions is collected directly from them.
2. Survey period: The agricultural campaign goes from May, every year, to February, the following year. The survey period corresponds to the agricultural campaign.

The field work is scheduled as follows:

May-September: enumeration of holdings, area measurement, placing of crop cutting plots. However, in some regions, such as Gao, where river flat crops are planted, this work is pursued until December.

December-mid-February: Harvest time. Interviewers go back to the fields for the crop cutting.

3. Survey content: the survey has three main parts:
- A. Population: estimation of rural population and agricultural population.
  - B. Agricultural variables: area by crop (crops in pure stand and in association). During the survey all crops planted are enumerated. However, for analysis only the following crops are considered: cereals (millet, sorghum, maize, rice, fonio, wheat); commercial crops (groundnuts, cotton). All the other crops are grouped under a general group named "other products". Vegetables and fruits are not covered by this survey.
  - C. Livestock on the holding: a distinction is made between draught animals (oxen, camels, donkeys, horses) and other animals. However, the estimate made gives only livestock living on agricultural holdings and not the total number of livestock of the country, since landless holdings having only livestock are not covered by the survey.

#### Field organization

There is a complete decentralization of the survey and the Regional Director of Statistics and Planning has the sole responsibility of the operation in his region. He is wholly responsible for the organization and the execution of the survey in the field. Once documents arrive at the DNSI, a document called an "observation booklet", summarizing all observations, errors and processing difficulties encountered is prepared. This document is sent back to the Regional Director for reference during the following year's survey. DNSI does not keep any copy of that document and, in doing so, it is not in a position to know whether those observations have been taken into account by regional directors.

Field staff training is completely assured by regional directors. No instruction is given by the head office on the way this training should be conducted.

Normally, it is planned that, every year, some DNSI staff members, composed of former experienced supervisors and the Head of the Surveys Division, undertake a supervision mission in each region. Terms of reference of those missions are random selection of a certain number of interviewers working under responsibility of some supervisors and control of their work by repeating measurements of angles and areas already made by those interviewers. On the other hand, a systematic control of completeness of holders is not made.

In each region a director is appointed (Ingénieurs de Travaux Statistique ITS or Adjoint Technique) and a deputy director. Interviewers reside in subdistricts or sometimes in villages assigned to them. There is a supervisor for every three interviewers. In the office there are supervisors who perform office editing of documents before they are forwarded to DNSI. Every interviewer covers three or four neighbouring villages.

#### Sampling

Each region is a stratum and estimates are made for regions. The stratification criterion in each region is the agro-climatic zone.

The primary sampling unit is the village; they are classified into agro-climatic zones according to their position in the field. The village is considered as a whole, i.e., including all its hamlets, even if they are very far from the main village. The total sample of villages is 420.

Secondary sampling units are holdings. The number of holdings selected differs from one village to another according to the size of the population:

Up to 300 persons : 3 holdings  
600-900 persons: 8 holdings  
900 and more : 12 holdings

On each holding all parcels and fields are enumerated. The number of crop-cutting plots varies according to the size of the field. For bigger fields eight crop-cutting plots are taken, and for smaller plots, only four.

However, crop-cutting plots are not placed in all villages, but only in 50 percent of them. All plots enumerated in a village selected for placing crop-cutting plots are classified according to the type of crops and tenure (private and collective). The interviewer makes a systematic selection of collective plots (rate : 1/2) and private (rate : 1/3). Lists are prepared separately for each crop and tenure. But when making estimates of area and yields, the rates 1/2 and 1/3 are not taken into account. The average number of crop-cutting plots placed in a village is 35.

#### Role of the Ministry of Agriculture in the survey

An Agricultural Statistics Service has been set up in the Ministry of Agriculture. But at the moment this service is not operational because of lack of personnel. For that reason, at present the Agricultural Statistics Service does not play a role in the organization of the survey, even if it is the main user of data collected.

ECONOMIC RESEARCH AND PLANNING SERVICE, MINISTRY OF AGRICULTURE - REPUBLIC OF GHANA

Annual Sample Survey of Agriculture, 1982

Form 1: Listing of Holders in Selected Enumeration Areas

Region \_\_\_\_\_ District \_\_\_\_\_

L.A. \_\_\_\_\_

EA: Category: U  SU  R

Number

Locality \_\_\_\_\_

Date of Listing \_\_\_\_\_

Serial No.	Compound or house	Full name of the Head of Household	Farm household in 1982?	Serial No. of farm household	Full name(s) of household member(s) recognized as agric. holders	Holder's holding in 1982				In case of crop holders, tick below which of the crops will be grown in either season of 1982																
						Relation to Head	Sex	Age	Crops?	Livestock?	Poultry?	Cereals			Tubers and Roots					Pulses and Nuts						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

For the Census this form will be applied to all EAs.  
 For annual surveys the form will be applied only to a sample of EA's. Here it will not be taken into account. State farms, for which information will be sought directly from the agencies. The other large farms will be included.

Date of Completion: \_\_\_\_\_

Name of Enumerator: \_\_\_\_\_

Signature: \_\_\_\_\_

Date of Submission: \_\_\_\_\_

Name of Supervisor: \_\_\_\_\_

Signature: \_\_\_\_\_



APPENDIX II

EXAMPLES OF SURVEYS UTILIZING THE HOUSEHOLD APPROACH

FOR COLLECTING DATA ON AGRICULTURE

KENYA

The collecting and analysing of data needed for economic development planning and monitoring of the implementation of plans is the responsibility of the Central Bureau of Statistics (CBS) of the Ministry of Planning and Development.

Since 1970 the CBS has been involved in establishing a permanent system of data collection.

During the first five-year programme, called the National Integrated Sample Survey Programme (NISSP), a permanent survey system has been created.

The main objective of the NISSP was to carry out an Integrated Rural Survey (IRS) in four rounds, each round covering an agricultural year. The survey was carried out from 1974 to 1979 and covered a large range of subjects: demographic, socio-economic and agricultural statistics. The household was the observation unit for all surveys. From this period on the household approach has been adopted for collecting data on the traditional sector of agriculture.

This integration was possible owing to a sensible choice of definitions of household and holding.

The following definitions were set up:

Household: One or more persons living together under the same roof, or several roofs within the same compound, sharing the same community of life through their dependence on the same holding as source of income and food products and sharing usually, but not necessarily, food from the same pot.

Holding: All land used wholly or in large part by a household for agricultural production and constituting only one economic unit under the responsibility of the head of household.

From these definitions follows a one-to-one correspondence between household and holding. Thus, a holding was identified through a household and it was possible to produce tables cross-classifying households with holdings.

PEOPLE'S REPUBLIC OF THE CONGO

In the People's Republic of the Congo, the agricultural statistics and macro-economic service in the "Direction des études et de la planification", Ministry of Agriculture and Livestock, is in charge of agricultural data collection.

The service, with the help of the "Centre national de la statistique et des études économiques" (CNSEE) which is the central statistics agency of the PRC, organizes censuses and surveys. An agricultural census was carried out in 1972 and a "mini-census" of agriculture in 1982.

The PRC participates in the NHSCP and decided to include the next census of agriculture (1984) in the national programme of household surveys. This census is the second survey of the programme; the first is the labour force survey in urban areas.

Since the 1972 census, the household approach has been implicitly used, to the extent that holdings were identified through households and most often were attached to the households. For the second census it was decided to define the traditional agricultural holding as "all the land used wholly or partly for agricultural production, including livestock on this land, and the head of household is considered the holder".

The P.R. of the Congo is, at the same time, preparing a population census and is considering the use of this one-to-one correspondence between the household and the traditional holding to enhance certain analyses.

For the income-expenditure survey it is envisaged using a sub-sample of the census sample.

Also, for the second census the sampling frame will be based on the list of enumerator areas established for the population census and not as before on the list of villages.

APPENDIX III

LIST OF REFERENCES

1. Programme for the 1980 World Census of Agriculture, FAO, Rome
2. Collecting Statistics on Agricultural Population and Employment, FAO, Rome
3. Programme for Statistics of Food Consumption and Nutrition, FAO, Rome
4. Estimation of Crop Areas and Yields in Agricultural Statistics, FAO, Rome
5. Guide to Statistics of Livestock and Livestock Products (provisional), FAO, Rome
6. Taking Agricultural Censuses, FAO, Rome
7. Report on the World Conference on Agrarian Reform and Rural Development, FAO, Rome
8. Analysis of Food Consumption Survey Data for Developing Countries, FAO, Rome
9. Manual on Household Food Consumption Surveys, FAO, Rome
10. National Methods of Collecting Agricultural Statistics, FAO, Rome
11. Expenditure Patterns of Working Class Households 1963-64. Department of Statistics, Kingston, Jamaica
12. Household Budgetary Survey Report 1970. Commonwealth of Bahamas, Department of Statistics, Bahamas
13. Integrated Rural Survey 1974-75. Central Burea of Statistics, Ministry of Finance and Planning, Republic of Kenya, 1977
14. Mijares, T.A., "Household Surveys in the Philippines", In: Brown, J. et. al. (eds.). Multi-purpose household surveys in developing countries, p. 131
15. United Nations. Principles and Recommendations for the 1970 Population Censuses. Statistics Study, Series M., No. 44, 1967
16. Assessment and Collection of Data on Post-Harvest Foodgrain Losses, FAO, Rome
17. 1970 World Census of Agriculture. Analysis and International Comparison of the Results, FAO, Rome
18. Development of an Integrated Programme of Household Surveys: A Review of Major Issues. NHSC:, UN Statistical Office. (to be published)
19. Yates, F. Sampling Methods for Censuses and Surveys. Charles Griffin and Co., London
20. Assessment and Collection of Data on Pre-Harvest Foodgrain Losses, due to Pests and Diseases, FAO, Rome





