# CHAPTER 1

# INTRODUCTION

If we could just know where we are and whither we are tending
we could better judge what to do, and how to do it.
Abraham Lincoln

## 1.1 Background

One of the most basic objectives of FAO is the development and improvement of food and agricultural statistics, particularly in developing countries. Despite an increasing awareness of the importance of statistics in planning social and economic development, most developing countries do not have an adequate statistical organization or trained statistical personnel for collecting, processing and analysing food and agricultural information. In particular, statistical development is slow and agricultural censuses, surveys and other statistical inquiries are often undertaken in isolation from each other and from the uses their results are to serve. Further, there is often a lack of understanding and coordination between statistical agencies and economic analysis, planning and decision-making offices, making it difficult to obtain the necessary cooperation among these important elements of the national information system for food and agriculture.

The collection, processing, analysis, dissemination, and use of data are costly and time consuming processes, requiring trained personnel, organization, transport and related facilities and services. Developing countries, however, have severe financial, human and institutional resource limitations. These problems have been addressed through such technical assistance funds as the United Nations Development Programme (UNDP) (formerly, the Extended Programme of Technical Assistance and the United Nations Special Fund), government cooperative Trust Funds, and the FAO Technical Cooperation Programme. These funding sources have provided developing countries with badly needed technical assistance in the form of resident experts and consultants in food and agricultural statistics, training, data processing and the provision of related equipment. The earliest recorded technical assistance project in a developing country was on crop surveys in 1951. The number of such projects has grown to about

60, including regional statistical advisers on specific subjects, e.g., training and commodity statistics.

The FAO training programme for the 1960 World Census of Agriculture also benefitted from these funds for the organization of training centres at the international, regional and national levels. Due to the UNDP funding crisis in the late 1960s, however, funds for the regional statistical advisers and training centres were discontinued. The number of projects in food and agricultural statistics also declined significantly, recently levelling out at about 40. Further, a large share of the current projects are funded by the FAO Technical Cooperation Programme and are short-term projects designed to fill explicit, critical needs and not lasting more than one year. A few longer-term projects are funded by UNDP and Trust Funds.

Substantial progress has been achieved over the past several decades in improving food and agricultural statistics in developing countries. Approximately 150 countries conducted an agricultural census during the decade of the 1970 World Census of Agriculture Programme (1966-75), and similarly 150 countries will have conducted an agricultural census during the decade of the 1980 World Census of Agriculture (1976-85). In addition, a large number of countries routinely conduct sample surveys in food consumption, household income and expenditures, farm management, marketing, crop yields and production, and many other socio-economic areas of food and agriculture.

Yet, there continue to be problems and need for improvement. Often, field enumeration has been attempted without the development of sufficient statistical infrastructure, i.e., organization, trained manpower, vehicles and other equipment. Further, inadequate attention is often given to data processing and analysis and dissemination. In some statistical projects, the end of the field enumeration is also the end of the census or survey organization, and the material used, e.g., lists, sketches, maps, instructions and worksheets, is discarded without consideration for its possible future use. Also, there is often little or no ex post evaluation of the work done, where the performance of various processes is evaluated in terms of the frequency and types of errors, time spent, and costs in order to improve the conduct of future activities.

To overcome these problems, FAO has periodically promoted the preparation of national, long-term, integrated programmes of food and agricultural statistics in developing countries. For example, about two decades ago, FAO made an effort to facilitate the dialogue between

national statistical agencies, planners and decision makers regarding data needed for agricultural development planning. As a result, for the first time, an integrated, phased programme was prepared for developing statistics geared to agricultural development planning requirements. The programme, specifically targeting countries in the FAO Near East Region (FAO 1968), was meant to be a framework to guide each country in identifying its stage of statistical development and determining its statistical development priorities in light of its own resources and agricultural development planning data needs.

In another effort, J.S. Sarma, a member of the FAO Statistics Advisory Committee of Experts, proposed a multi-year programme of censuses and surveys in food and agriculture (Sarma 1971). Also, training centres in developing countries have promoted the concept and application of long-term, integrated programmes of food and agricultural statistics -- in Kenya in 1970 and at the Statistical Institute for Asia and the Pacific in Japan in 1974. Finally, the first UNDP project to implement a long-term integrated programme was carried out in the five central African countries in 1973 and recently in Ethiopia.

Statistical problems exist in different countries with differing degrees of severity and with emphasis on different causes and effects. Basically, however, in all cases, the roots of the problems are buried in inadequate national efforts of an interdisciplinary, inter-ministerial and continuing nature in the development and operation of an information system to support effective government intervention in the sector.

Information required for planning agricultural development and the methodology for collecting, processing and analysing data on food and agriculture are well summarized in references cited above and elsewhere. Also, most of the essential elements for developing a national information system for food and agriculture have been conceptualized and promoted over the last several decades (e.g., Bonnen 1977). What seems to be lacking is an institutional framework, firmly embedded in an interdisciplinary national effort, which promotes, in a balanced and coordinated way, the major dimension of such a programme -- an approach that provides dynamism through the continuous dialogue between users and producers of information in order to meet the changing demand for information effectively and efficiently -- constantly reviewing the underlying concepts, definitions and methods, and developing and maintaining the necessary human, financial and institutional resources.

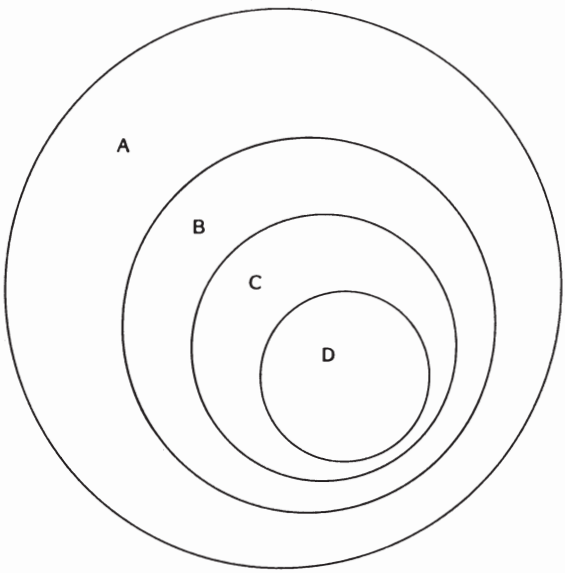
The national information system context for food and agricultural statistics presented herein can provide such a framework for the food and agricultural statistics programme component of such a system. It views the entire national information system, including decision makers, statisticians and analysts, as an integrated whole rather than as a collection of independent and unrelated activities. Each activity in the system, e.g., food and agricultural statistics, is designed to function in complementary interaction with other activities, so that concepts and definitions are harmonized and related activities are linked or coordinated to provide consistent, relevant, timely and reliable information.

The subject-matter scope of the national information system covers all areas relevant to public (and possibly some private) decision making, as indicated in the largest circle (A) in Figure 1.1. The conceptual focus of this manual is the subset of information of interest to food and agricultural decision makers, as indicated by circle B in the diagram, with special emphasis on food and agricultural information (circle C), of which food and agricultural statistics (circle D) comprise a further subset. Examples of information in B but not in C include demographics and national accounts, while examples of information in C but not in D include policy analysis studies and situation and outlook reports.

In the terminology of this manual, the "national information system" refers to the structure of information covered in A and the institutional organization which provides it. Similarly, the "national information system for food and agricultural decision making" corresponds to B, the "food and agricultural information system" to C, and the "food and agricultural statistical programme" to D.

## 1.2 Objective and Outline

The overall objective of this manual is to provide a general understanding of the structure and operation of a country's national information system for food and agricultural decision making and general guidelines on the planning and implementation of the food and agricultural statistical programme as an integral part of the total system. Such an information system will be: (a) effective and efficient in providing timely, relevant, accurate, accessible, and consistent information to food and agricultural decision makers; (b) able to adapt structurally and conceptually to changing conditions and an evolving policy agenda, thus avoiding conceptual and institutional obsolescence; and (c) consistent with the human, financial and institutional capabilities of the country as those capabilities develop and grow over time.




A - Information for public decision making
B - Information for food and agricultural decision making
C - Food and agricultural information
D - Food and agricultural statistics

Figure 1.1 - Subject-matter coverage of a national information system from a food and agriculture perspective

Following this brief introduction, food and agricultural decision makers are identified in Chapter 2, and the role of information, and thus of statistics, in decision making is discussed in Chapter 3. In Chapter 4, the system approach, defined as a formalized problem-solving process, is applied to the design of information systems. A general classification scheme for identifying and defining the operational concepts which specify the boundaries of food and agricultural information is detailed in Chapter 5. Chapters 6 and 7, then, focus specifically on features of statistical and analytical programmes, respectively, while programme implementation guidelines are offered in the final chapter, Chapter 8.

Countries following the guidelines contained in this manual will find that the information base supporting economic development and other policy concerns in food and agriculture will be more relevant and useful, that policy efforts will thus be more successful, and that, as a consequence, government intervention in food and agriculture will be more effective and better understood and appreciated.

# CHAPTER 2

# FOOD AND AGRICULTURAL DECISION MAKING

The aim of this manual is to contribute to the development of improved programmes of agricultural statistics in developing countries. The overriding theme is that many of the statistical development problems encountered heretofore can be overcome by (a) improving the communication and coordination between providers and users of agricultural statistics, (b) recognizing statistical needs in the context of information for food and agricultural decision making, and (c) designing and implementing statistical programmes to fill those needs. Issues related to these tasks are addressed in the remaining chapters of the manual. The present chapter identifies the ultimate information users - food and agricultural decision makers -- while Chapter 3 describes the role information plays in their decision making.

A country's food and agricultural decision makers are defined, in the context of this manual, as those public, and possibly private, decision makers responsible for guiding and managing the development and performance of its food and agricultural system. The first section of this chapter, therefore, outlines the domain of "food and agriculture" in general terms, recognizing that detailed specifications will need to be made on a case-by-case basis to conform to the conditions and needs of particular countries. Section 2.2., then, elaborates the scope of national decision making in terms of its goals and performance objectives and its various subject areas and policy instruments.

## 2.1 The Domain of Food and Agriculture

The domain of food and agriculture encompasses the complex interactions of physical, climatic, biological, economic and social processes in the production, processing, distribution and utilization of food and agricultural commodities. These processes are carried out, given climatic conditions and soil and water resource endowments, by governments, households and production units. A general overview of these processes and agents is given below, followed by a more precise identification of the economic sectors and activities relevant to food and agriculture using the International Standard Industrial Classification.

### 2.1.1 Processes and Agents

In Figure 2.1, the rectangles represent the five principal agents, or categories of agents, involved in food and agricultural processes:

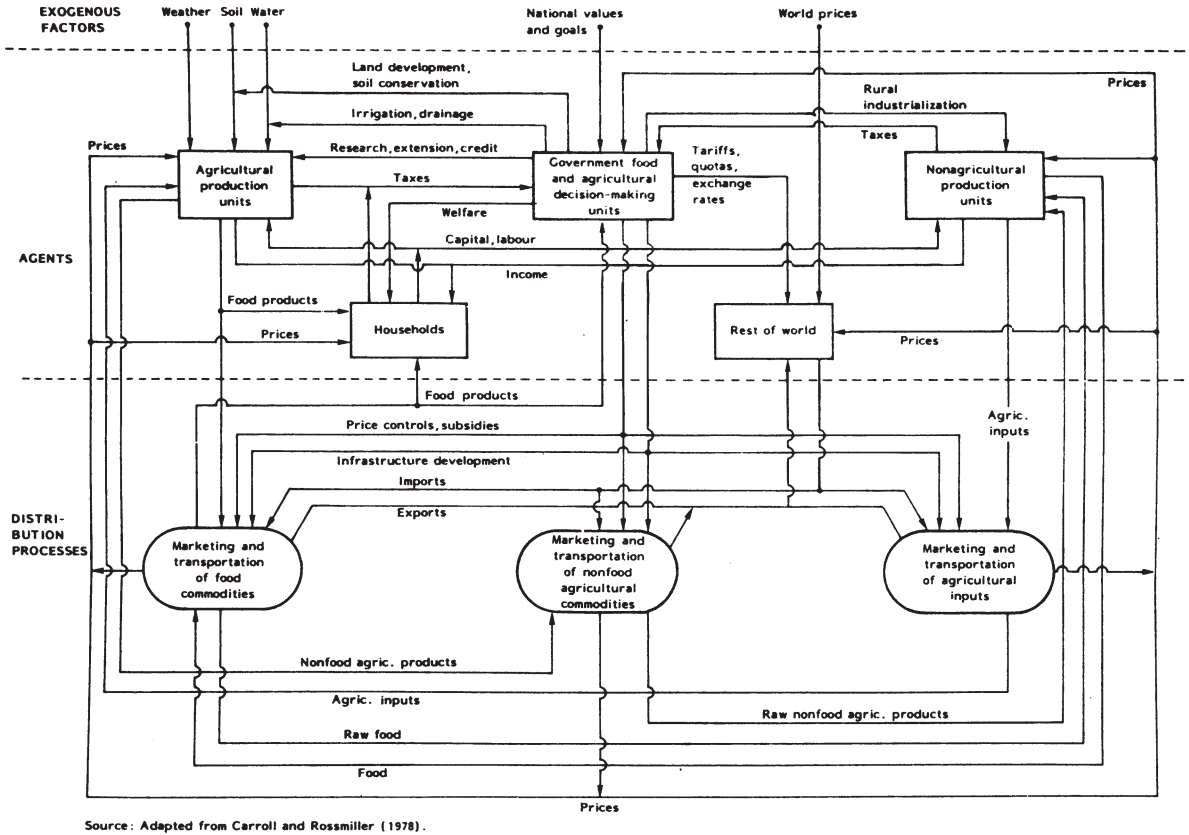
(a) local, regional and national government agencies;
(b) households, both farming and non-farming;
(c) agricultural production units, i.e., holdings and agricultural service establishments;
(d) non-agricultural production units, i.e., agents active in fisheries, forestry, food processing, and the production of all other goods and services, including marketing and transportation; and
(e) the rest of the world, as both a source of supplies and a destination of products and sometimes as a source of inputs.

Although the agents of the marketing and transportation processes are included with other non-agricultural production units, the processes themselves are indicated explicitly at the bottom of the diagram (represented by ovals) in order to clarify the flows of commodities and price information among the five groups of agents. In addition, monetary flows are implicit in the commodity flows through the distribution processes, although in the reverse direction.

Five key exogenous factors influence a nation's food and agriculture, as identified at the top of Figure 2.1: (a) weather, (b) soil, (c) water, (d) national values and goals, and (e) world prices. Of these factors, soil and water quantity and quality are partly controllable by government actions. In addition, national values and goals, while endogenous to the nation, can be considered exogenous to food and agriculture.

It is worth noting that Figure 2.1 is a simplified model of the domain of food and agriculture. Enhancements could be made, e.g., by distinguishing between farming and non-farming households, separating fishery and food processing establishments from all other non-agricultural production units, and identifying the inputs produced and used by agricultural production units. However, the simplicity of Figure 2.1 is adequate for this discussion.

The flows originating from the government decision-making units are the policies, programmes, and projects implemented to guide and manage the food and agricultural system. Decisions are made in light of national values and goals and relative prices, and are financed, at least in part, by business and personal taxes. Agricultural production units benefit from public investments in land and water development;




Source: Adapted from Carroll and Rossmiller (1978).

Figure 2.1 - Agents and processes in food and agriculture

research to develop new crop varieties and animal breeds and to improve cropping and livestock management practices; extension to disseminate information on research results; and credit programmes to facilitate the acquisition of modern inputs. Rural industrialization efforts, although directly concerned with non-agricultural production, are generally intended to keep labour and capital on farms and in rural areas by providing employment opportunities to reduce rural-urban migration and to increase income available to farm households which may be reinvested in agriculture. The welfare of households is enhanced by government programmes in health and nutrition, education, housing, family planning and direct income transfers. Interventions in the marketing and transportation processes, aimed at reducing food costs, include direct price controls and subsidies and investments in infrastructure to improve roads, bridges, and market and storage facilities. Finally, foreign trade is influenced by such trade policies as tariffs, exchange rates and quotas.

Households provide capital and labour to the production of agricultural and non-agricultural goods and services, in return for which they receive income. They are also the final consumers of food products, either directly from the farm, in the case of subsistence farming, or through market channels. Price information is used in both consumption decisions and in allocating labour and capital.

Agricultural production units purchase inputs and allocate land, water, capital and labour resources to the production of food and non-food agricultural commodities based on relative prices and the available resource supplies. Section 2.1.2 identifies the specific economic activities carried out by these agents.

Non-agricultural production unit are engaged in economic activities other than agriculture, although some of them are considered to be within the domain of food and agriculture, as indicated in Section 2.1.3. For example, fishery and food processing establishments are included in non-agriculture, as are the manufacturing of machinery, chemical fertilizers and other agricultural inputs and the marketing and transportation of food and agricultural commodities.

Finally, the rest of the world is the source of imports and the destination of exports, in response to world and domestic prices and government trade policies.

## 2.1.2 Economic Activities of Agriculture

The essential features of the economic activities carried out by agricultural production units can be outlined with reference to the ISIC, the United Nations' International Standard Industrial Classification of all Economic Activities (UN 1971), which provides a framework of the international comparison of national statistics. Major Division 1 of the ISIC, includes agriculture, forestry and fisheries and has the following structure:

| | |
|---|---|
| Major Division 1 | Agriculture, Hunting, Forestry and Fishing |
| Division 11 | Agriculture and hunting |
| Major Group 111 | Agricultural and livestock production |
| Major Group 112 | Agricultural services |
| Major Group 113 | Hunting, trapping and game propagation |
| Division 12 | Forestry and logging |
| Major Group 121 | Forestry |
| Major Group 122 | Logging |
| Division 13 | Fishing |
| Major Group 130 | Fishing |

Although the ISIC generally subdivides the three-digit Major Groups into four-digit Groups to obtain more homogeneous economic activity classes, no such Groups are identified for the Major Groups in Major Division 1, except fishing.

Major Groups 111 and 112 cover the activities of agricultural production units. (Note that the ISIC appears to limit the term "agriculture" to crop production alone, while in this manual it refers to both crop and livestock production). Although there are no Groups defined for agriculture, the ISIC provides a description of the contents of the Major Groups (UN 1971, p. 27):

> 111 Agricultural and livestock production
>
> Growing of field crops, fruits, grapes, nuts, seeds, tree nurseries, except those of forest trees, bulbs, vegetables, flowers both in the open and under glass; tea, coffee, cocoa and rubber plantations; raising of livestock, poultry, rabbits, bees, fur-bearing or other animals; the production of milk, wool, fur, eggs, honey; and silkworm egg and cocoon raising. Also included are establishments primarily engaged in landscape gardening, e.g., the planting and care of lawns, flower gardens, shade and ornamental trees. The processing of agricultural products on farms and plantations is covered

in this group if it is not feasible to report separately on the production of agricultural products, e.g., grapes, rubber, tea leaves, olive oil, nuts, milk, and the processing of these commodities.

112 Agricultural services

Agricultural, animal husbandry and horticultural services on a fee or contract basis, such as harvesting, baling, threshing, husking and shelling; preparing of tobacco for auctioning; animal shearing; pest destroying and spraying; seeding and spraying by aircraft; pruning; picking of fruits and vegetables and packing on the farm and on the account of the producers elsewhere; and the operation of irrigation systems. The provision, on a fee or contract basis, of agricultural equipment along with the services of drivers and other attendants of the equipment, is covered in this group, but the letting of agricultural equipment solely is classified in major group 833 (Machinery rental and leasing). Veterinary services on a fee or contract basis are classified in group 9322 (Veterinary services); establishments primarily engaged in the transportation of farm products are classified in the appropriate group of division 71 (Transport and storage); and the operation of horse and dog racing stables are classified in group 9490 (Amusement and recreation services, not elsewhere classified).

Further clarification of the economic activities of agricultural production units (holdings) is needed for national accounts purposes, particularly in cases where the holdings are also engaged in non-agricultural activities. Two types of non-agricultural activity of holdings are distinguished: secondary activities and ancillary activities. Generally, ancillary activities are considered part of agriculture in national accounts.

Non-agricultural activities for which separate information can be obtained on inputs and outputs are considered to be "secondary activities" carried out by establishments apart from holdings; otherwise, they are "ancillary activities" of the holdings. Examples of secondary activities include own-account construction, retail shops of holders, and transport units which provide services for hire. Examples of ancillary activities include garages, repair shops, warehouses and the harvesting of forestry and fisheries products from forests and waters on the holding.

Two other criteria may also be used in differentiating between secondary and ancillary activities of agricultural production units: the size of the activity and its purpose. As a general rule, non-agricultural activities which are of small scale or which are mainly for the use of the holding rather than for sale in the market are considered ancillary.

### 2.1.3 Other Economic Activities Related to Food and Agriculture

The domain of food and agriculture includes many other economic activities besides those of agricultural production units. Some have already been mentioned above, such as food processing, fisheries, veterinary services, and marketing and transportation. These and others are listed below, by ISIC classification, with comments indicating their relevance to food and agricultural decision making.

Forestry and Logging (Major Group 12) -- in so far as food products are harvested and income is provided to agricultural households and holdings as ancillary activities.

Fishing, particularly Group 1302 (Fishing not elsewhere classified), which includes inland waters fishing -- as a producer of food commodities and in so far as income is provided to agricultural households and holdings.

Manufacture of food, beverages and tobacco (Division 31) -- of importance in food and nutrition and as a market for agricultural products; where economically feasible, also a target of government promotions of rural industrialization and import substitution.

Manufacture of textiles (Major Group 321) and Manufacture of leather and products of leather (Major Group 323) -- as a major market for non-food agricultural products, policies promoting the development of these industries can be an important stimulus to agricultural holdings and their income.

Manufacture of fertilizers and pesticides (Group 3512) and Manufacture of fertilizers and pesticides (Group 3822) -- where economically feasible, developing these industries can improve the availability of these important agricultural inputs while reducing foreign exchange costs.

Construction (Major Division 5) -- includes the construction of irrigation and drainage facilities and major infrastructural development to improve the efficiency of the marketing and transportation of food and agricultural products, e.g., roads, bridges, railroads and seaport facilities.

Wholesale trade (Division 61), Retail trade (Division 62) and Transport and storage (Division 71) -- government programmes to develop and improve the efficiency of these services can be an important factor in reducing food costs.

Financial institutions (Division 81) -- as targets of policies to improve the availability of credit to agricultural producers.

Machinery and equipment rental and leasing (Major Group 833) -- making these services available in rural areas can be a means of facilitating farm mechanization.

Education services (Major Group 931) and Medical, dental, and other health services (Group 9331) -- in rural areas, in so far as rural development programmes and human capital formation in agriculture are of concern to food and agricultural decision makers.

Research and scientific institutes (Major Group 932) -- with respect to public and private institutes engaged in research in technical agriculture, agricultural economics and farm management, and rural sociology.

Veterinary services (Group 9332) -- services to livestock producers on a fee or contract basis.

Business, professional and labour associations (Major Group 935) -- with respect to farmers' cooperatives and other associations and agricultural workers' unions; development of such associations many be part of agricultural and rural development efforts.

## 2.2 The Scope of Public Food and Agricultural Decision Making

The public decision-making (i.e., policy-making) process, applies policy instruments to the target world (the food and agricultural sector, as delimited in Section 2.1) in order to achieve performance objectives and, ultimately, national policy goals. These elements of public policy are elaborated in the following sections, and the general relationships among them are indicated in Figure 2.2. Note in particular the feedback relationship whereby policy makers use information on the degree of attainment of performance objectives, i.e., performance indicators, in allocating resources to, and otherwise adjusting, the application of policy instruments to the target world.

### 2.2.1 General Policy Goals

In a very general way, policy goals may be viewed in terms of their relative emphasis on (a) growth, including the efficient allocation of existing resources in food and agricultural production and investment in improving the productivity of those resources and creating additional resources; (b) equity, encompassing the distribution, among nations, groups within nations and individuals within groups, of agricultural resources, products and income; and (c) stability, which adds a time dimension to the other two goals in terms of reducing year-to-year fluctuations along the time path of progress towards their attaiment.

The goal setting performed in the policy-making process establishes the relative importance of these three general goals, and thus the weights for evaluating trade-offs among them when they are in conflict with one another. For example, reducing tax rates on high-income individuals in order to induce additional investment amounts to a decision to promote a growth objective at the expense of increasing the inequality of income distribution.

Goal setting is a dynamic process which is affected not only by the feedback from performance indicators but also by factors outside the food and agricultural sector. In the early stages of development, public decision-making goals are not apt to be well specified. Therefore, information on the trade-offs among performance indicators, gained by experience with different policy instruments, will affect the weights assigned to the growth, equity and stability goals, i.e., improved knowledge of what is achievable influences the goal structure generated by the policy process.

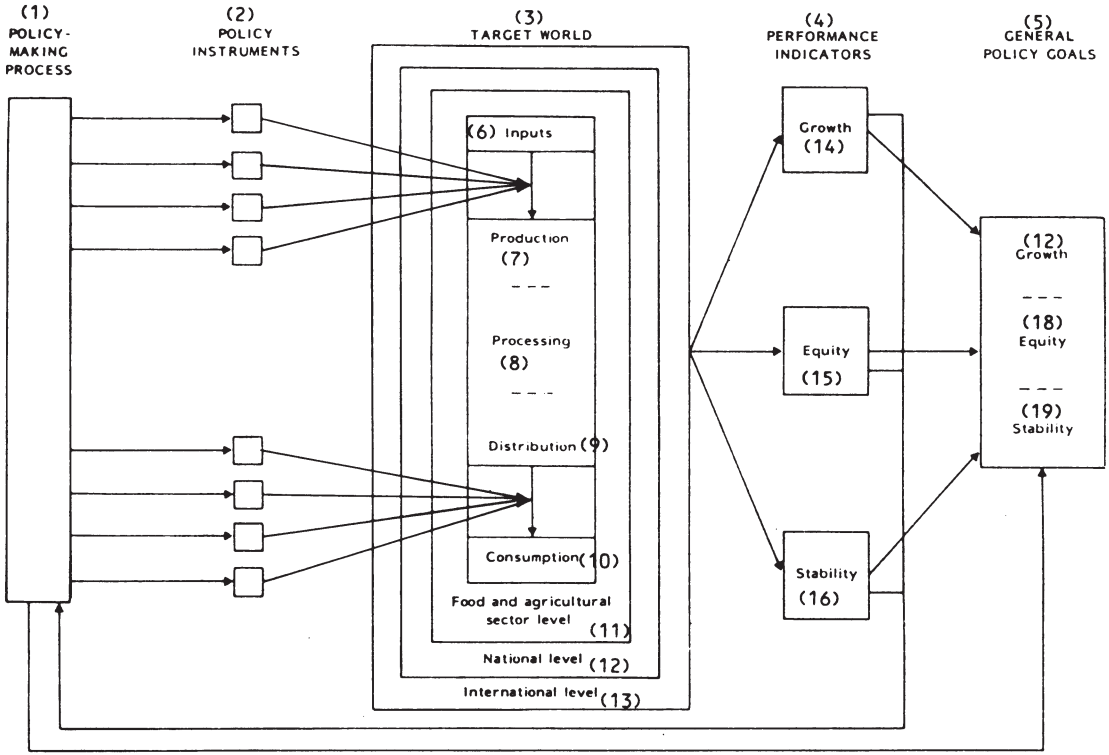



Figure 2.2 - Food and agricultural policy

### 2.2.2 Performance Indicators and Objectives

Performance indicators are specific variables in the target world which are observed and measured to gauge the success of the policy instruments in achieving policy goals. Policy objectives are desired values which the instruments are to attain, usually by some specified point in time. Attainment of these objectives, then, indicates satisfactory progress toward the general goals. The indicators, along with other information, serve as inputs to the policy process for adjusting the instruments and objectives and the relative importance of the goals.

Examples of typical indicators associated with each of the three general goals are:

(a) growth: agricultural production and value added, labour efficiency, crop yields, rate of return on investment, meat or milk yield of feed, cost of food, and input costs;

(b) equity: farm/non-farm income ratio, nutritional status of socio-economic groups, size distributions of land holdings and income, unemployment rate, and cost of agricultural subsidies; and

(c) stability: year-to-year fluctuations in grain production, livestock production, food prices, and income, measured with, for example, means and standard deviations or frequencies and amplitudes.

### 2.2.3 Policy Instruments and Subject Areas

The means available to public decision makers to achieve policy goals and objectives are many and varied. Typically, a particular policy instrument, although intended to affect primarily either growth, equity or stability, also has some impact on the other goals. Thus, national food and agricultural policies, which are generally composed of combinations of instruments, can have both complementary and conflicting elements, and both desired and undesired results. The two approaches presented below for classifying instruments illustrate these combinations and the range of subject areas of concern to food and agricultural decision makers.

First, although nations vary widely in their reliance on market mechanisms to allocate food and agricultural resources and products, the separation of policy instruments into those that deal with (1) prices and quantities in the factor market and (2) prices and quantities in the product market is useful (Figure 2.2). A few examples of instruments in each of these four sets are given in Table 2.1.

A second way to organize policy instruments is hierarchically, where lower level instruments represent implementations of higher level instruments. That is, instruments can be considered to range from broad policies (higher level) to programmes for implementing those policies (middle level) to projects for implementing the programmes (lower level). Figures 2.3-2.5 illustrate this arrangement for, respectively, three broad policies: (1) improving food and nutrition, (2) improving the quality of rural life, and (3) promoting the contributions of agriculture to the national economy.

These broad policies are shown at the left of each figure. To the right are listed areas of policy action available for implementing policies. For example, alternative ways of improving food and nutrition, one or more of which may be pursued, include (4) increasing the food supply, (5) influencing the per capita demand for food, and (6) decreasing the population growth rate. Alternative ways of achieving each of these instrumental objectives are identified next, and so on, moving further to the right, until more narrowly focused policy instruments, e.g., at the project level, are reached.

Since a given instrument may serve to implement more than one higher level instrument or objective, duplication of the hierarchical progression from that point onward is avoided by showing the progression only the first time the instrument appears and then cross-referencing (with box numbers) back to that point for later occurrences. For example, population control (box 13 in Figure 2.4) is one means of achieving a smaller number of farmers (box 33) and also of achieving a decreased population growth rate (box 6 in Figure 2.3); it is from the latter point that the hierarchical implementation of a population control programme is continued, to boxes 25 and 26 and so on.

Policy instruments for achieving policy objectives and goals are numerous, cover a wide range of subject areas, and are related to one another in both complementary and conflicting ways, as indicated above. Thus, it is uncertain to what degree policy actions will have their intended direct effects without undesired side effects. It may not even always be clear what the appropriate goals and objectives are

Table 2.1
Categories of Food and Agricultural Policy Instruments, by Market

1. Factor Market

   a. Price Instruments

      1. Tax incentives to increase investment in agricultural resources
      2. Interest rate subsidies
      3. Payments to farmers to withdraw land from production
      4. Export and import tariffs and subsidies on fertilizer, fuel, machinery and other inputs
      5. Property taxes on machinery, livestock, and real estate
      6. Minimum wages for agricultural workers

   b. Quantity Instruments

      1. Collectivization of farms into larger units
      2. Land redistribution with upper limits on farm size
      3. Government-operated vocational training and extension programmes
      4. Government-sponsored agricultural research and technology development
      5. Public investment in land and water development
      6. Export and import quotas on fertilizer, fuel, machinery and other inputs

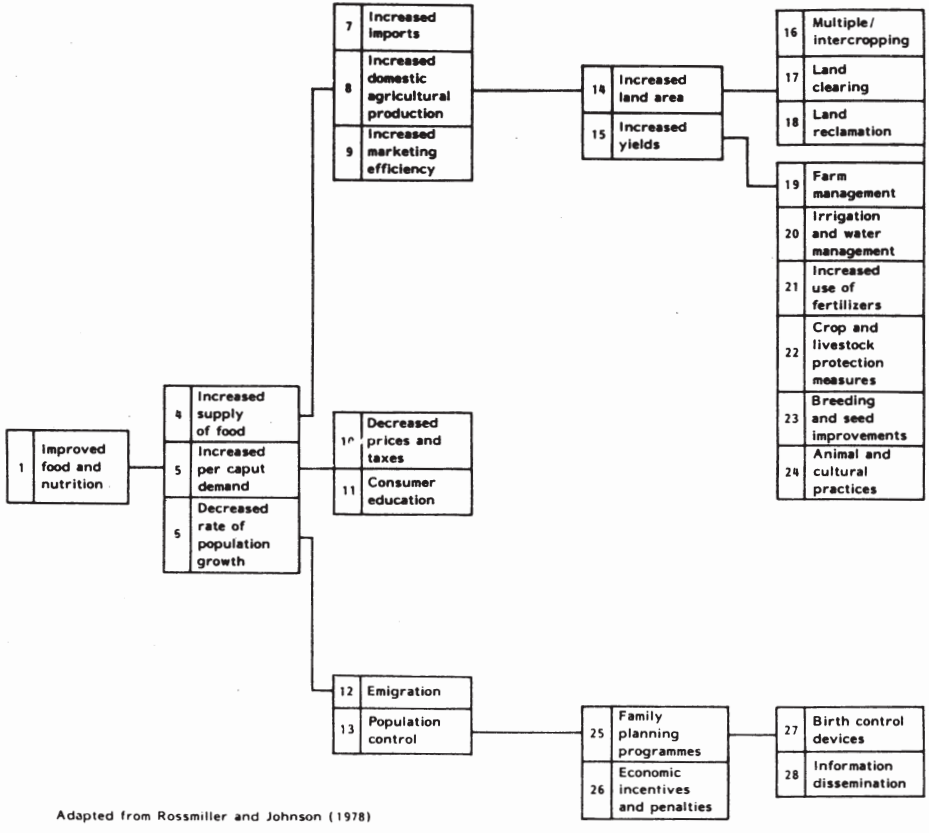
2. Product Markets

   a. Price Instruments

      1. Price supports for farm products
      2. Government-sponsored crop insurance
      3. Consumer price subsidies or ceilings for food products
      4. Export and import tariffs and subsidies on agricultural products
      5. Differential taxation of certain agricultural products (e.g., tobacco and alcohol)

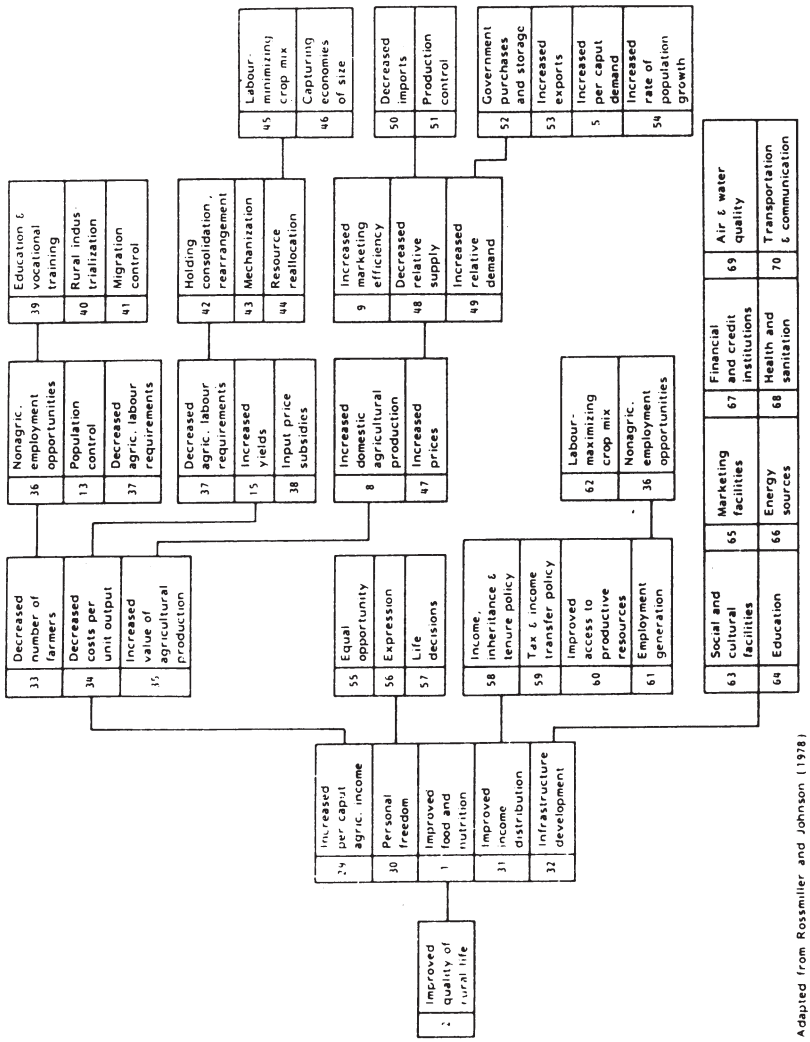
   b. Quantity Instruments

      1. Assignment of production quotas to production units
      2. Government food purchases and sales to selected population groups
      3. Export and import quotas on agricultural commodities
      4. Government operation of buffer stocks of agricultural commodities
      5. Quantity-oriented trade agreements at world market prices




Adapted from Rossmiller and Johnson (1978)

Figure 2.3 - Policy areas relevant to improved food and nutrition




Adapted from Rossmiller and Johnson (1978)

Figure 2.4 - Policy areas relevant to improved quality of rural life

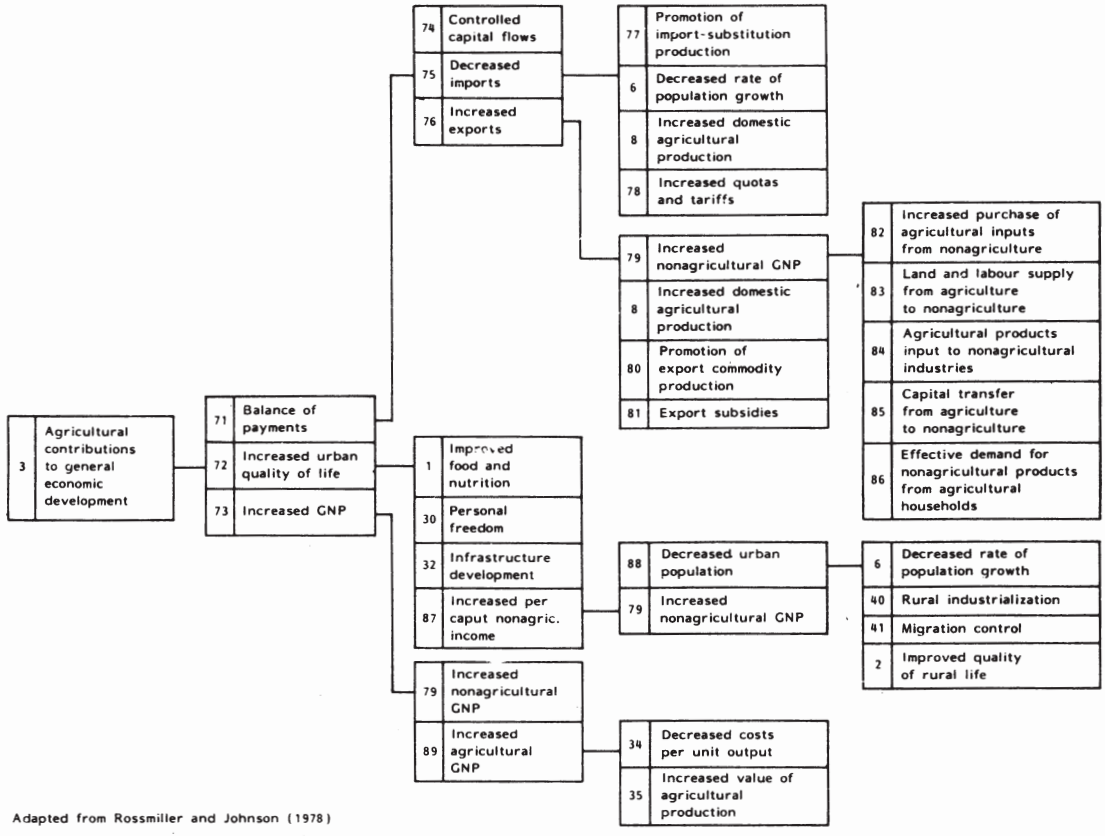



Figure 2.5 - Policy areas relevant to agricultural contributions to general economic development

or should be, in that they emerge through the complex and dynamic political process in which various individuals and groups of the national society manoeuver for power to promote their interests. These problems are addressed in the next chapter.

One of the most difficult tasks in developing an adequate information system for policy purposes is to identify and measure (or estimate) statistical indicators of the performance of these policy instruments. This issue is addressed in a general way in this manual. However, the selection and measurement of specific performance measures -- such as socio-economic indicators to monitor and evaluate agrarian reform and rural development programmes -- are the subject of other manuals in this Statistical Development Series.