

CHAPTER 5

OPERATIONAL CONCEPTS FOR MEASUREMENT AND ANALYSIS

Information for decision making is provided by the information system's processes of (a) observation and measurement and (b) interpretation and analysis, in iterative interaction with the decision-making process, as discussed in Chapter 4 (Figure 4.5). Both information-providing processes are ideally founded on a common set of basic concepts and operational definitions of those concepts, which also defines the observational filter governing how we look at the target world and what we see there. This chapter defines and classifies specific items of information needed to operationalize key concepts covering the domain of food and agricultural decision making (described in Chapter 2). A standard, comprehensive classification scheme of information items is presented in Section 5.1, while Section 5.2 indicates how the items are used in various decision-making contexts. Detailed definitions of the main items in each category are given in Section 5.3.

The standard classification and definitions offered here are intended to facilitate international comparisons (e.g., in agricultural censuses, commodity supply and utilization accounts, and economic accounts for agriculture) and to help national statistical programmes organize and manage data collection and processing activities within their countries, although individual countries may need to add or delete items, or modify item definitions, in order to better describe their own unique situations. The items are called information items because they are also the subject of activities of analytical programmes, i.e., they refer to measured facts (data -- see the Glossary) about the target world and also to hypotheses, projections, implications and conclusions about that world.

5.1 Standard Classification Scheme

The complete classification scheme, with code numbers, is presented in Appendix I. The items classified are defined as specific pieces of information on particular aspects of the target world and relate both to subject-matter areas, covering the entire domain of interest to food and agriculture decision makers, and to participants in those areas, e.g., such economic agents as farmers, input suppliers, wholesalers and food processors. For statistical programmes, the classification and definitions provide guidance in

specifying the scope and frequency of measurement instruments and the practical problems associated with each instrument. The right-hand column in Appendix I indicates, for each item, appropriate data sources and measurement instruments, which are discussed further in Chapter 6. For analytical programmes, the classification and definitions provide a firm basis for identifying relevant variables to model and analyse, enabling analysts to trace, for example, the flow of a commodity from production through processing and distribution to final consumption, together with information on the economic agents involved at each stage. The policy analysis process and the use of models are described in Chapter 7.

The subject-matter categories, while emphasizing agricultural production, cover the entire domain of food and agriculture. Category 01 identifies the economic agents associated with the agricultural production units described in category 02, and category 03 provides information on household members. Labour force and employment information is covered in category 04, while category 05 describes the availability, tenure, use and development of land and water resources for agricultural production. Categories 06-08 provide commodity-specific information on crop and livestock production and the use of inputs, while categories 09 and 10 cover the capital stocks of, respectively, machinery and equipment, and buildings and other structures. Forestry and fisheries activities which are ancillary to the activities of agricultural holdings are included in category 11. Credit, marketing and stocks are the subject of category 12; price information is provided in category 13; and post-harvest losses are described in category 14. Category 15 provides information on household incomes and expenditures. Finally, categories 16 and 17 include other relevant information, e.g., foreign trade, national accounts, and agricultural research and extension.

The major categories are subdivided in three additional levels of increasing specificity, called divisions, sections and subsections, respectively. Code numbers are constructed by assigning two digits to the categories and one digit each to the lower levels of the hierarchy. If a hierarchical level is missing, e.g., if there is no disaggregation of a division into sections or of a section into subsections, the corresponding digit for that level is zero. At the bottom of the hierarchy, individual information items within the subsections are assigned a sixth digit. Some items are further disaggregated by various dimensions of interest, indicated by a seventh digit in parentheses, e.g., age classes (1) under 1 year of age, (2) 1 year to under 2 years of age, and so on.

Since all items are, to some degree, related to one another, it is inevitable that any classification scheme such as this will scatter the items of interest to a particular subject among several

categories. For example, elements of "income" can be found in such categories as employment, crops and livestock in addition to category 15 (Income and Outlay). The analyst investigating a particular subject, therefore, needs to look through all categories in order to locate all items relevant to the topic of interest. Also, the list of items includes prices, values (e.g., of production or of consumption expenditures) and quantities. While given any two of these items for a commodity the third can be computed, all three are listed in order to provide a choice for data collection activities, since in certain cases it may be more practical to collect data on values, for example, than on prices.

Table 5.1 shows the structure and code numbers (to four digits) for the categories, divisions and sections of the generalized classification scheme. The complete list of subsections and items (to six digits) is given in Appendix I. This selection of items is motivated by the general information needs of food and agricultural decision making, as illustrated in the next section. Since those needs will vary with each country's particular situation, the item list should be modified accordingly for implementation on a country-by-country basis.

5.2 Use of Information Items in Food and Agricultural Decision Making

The broad goals of food and agricultural decision making are identified in Chapter 2: growth, equity and stability. Chapter 2 also discusses how these goals are pursued through the formulation, implementation, monitoring and evaluation of a hierarchy of policy instruments -- plans, policies, programmes and projects -- spanning the domain of food and agriculture. The details of the concepts and operational definitions embodied in the classification scheme presented here may seem far removed from these broad goals. As explained in Chapter 3, however, the connection results from the need for data and other information at every stage and level of decision making in order to deal with the complexities of the target world and reduce the inherent uncertainties.

With respect to agrarian reform and rural development, there is a need to identify indicators of people's participation. Some items included in Table 5.1, such as category 03 items relating to household members and 04 items relating to the labour force and employment, are relevant for monitoring and evaluating people's participation. However, a more adequate conceptualization of people's participation must be accomplished before items for this important dimension of agrarian reform and rural development can be encoded.

Table 5.1
General Classification of Food and Agricultural Information

Code Number*	Description*
01	<u>Identification</u>
011	Holding, holder, respondent
0111	Holding
0112	Holder
0113	Respondent for holding
012	Household, head of household, respondent
0121	Household
0122	Head of Household
0123	Respondent for household
013	Agricultural service establishments
014	Locality
015	Other units (to be specified)
02	<u>General Characteristics</u>
021	Holding
0211	Holder
0212	Hired manager
0213	Economic activities of an enterprise
022	Agricultural service establishments
023	Cooperatives
03	<u>Demographic and Anthropometric Characteristics</u>
031	General Information
0311	Household
0312	Household members
032	Guests
033	In-migration and out-migration
034	Anthropometric characteristics of household members
04	<u>Employment</u>
041	For each household member
0411	Status of labour force participation
0412	Occupation
0413	Employment status
042	Employment on holding
0421	For each member of holder's household (including holder) -- for holdings whose holders are real persons
0422	Agricultural workers, other than members of holder's household

Table 5.1 (continued)

Code Number*	Description*
043	Employment in agricultural service establishments
0431	Unpaid family workers
0432	Permanent agricultural workers
044	Cost of labour (for holdings and agricultural service establishments)
0441	Wages paid
0442	Cost of insurance and other fringe benefits
045	For each agricultural worker -- permanent and occasional (for holdings and agricultural service establishments)
0451	Identification
0452	Time worked
0453	Wages earned
046	Participants in cooperatives, collectives or communal holdings
047	Employment outside holding (for households of which at least one member is a holder)
0471	For each member of household (including holder)
05	<u>Land and Water</u>
051	For entire holding
0511	Number of parcels and total area
0512	Rental of land
0513	Land purchased or sold
0514	Shifting cultivation
0515	Use of soil conditioners
0516	New cropland
0517	New permanent meadows and pastures
0518	Irrigation
0519	Drainage
052	For each parcel
0521	Location, area and distance
0522	Area by tenure
0523	Rent
0524	Land use
0525	Irrigation and drainage
0526	Shifting cultivation
06	<u>Crops</u>
061	For entire holding
0611	Temporary crops
0612	Permanent crops
0613	Fertilizers
0614	Pesticides

Table 5.1 (continued)

Code Number*	Description*
0615	Seeds and young plants
0616	Animal power
0617	Machinery
0618	Crop insurance
062	For each parcel
0621	Crop stand
0622	Temporary crops - rotation and intensity
0623	Temporary crops - inputs used
0624	Temporary crops - outputs
0625	Permanent crops - plantation characteristics for each crop
0626	Permanent crops - inputs used during year - non-productive age
0627	Permanent crops - inputs used during year - productive age
0628	Permanent crops - output
0629	Permanent crops - nurseries
07-08	<u>Livestock</u>
071	Management and population
0711	Livestock production system
0712-0713	Total number of livestock kept - present population
072	Cattle
0721	Herd structure and management
0722	Veterinary
0723	Feed
0724	Labour
0725	Other inputs
0726	Production - meat
0727	Production - milk
0728	Production - other
073	Buffaloes
0731	(same as 0721-0728 for cattle)
074	Sheep
0741-0746	(same as 0721-0726 for cattle)
0747	Production - wool
0748	Production - milk
0749	Production - other
075	Goats
0751-0756	(same as 0721-0726 for cattle)
0757	Production - wool
0758	Production - milk
0759	Production - other
076	Pigs
0761-0766	(same as 0721-0726 for cattle)

Table 5.1 (continued)

Code Number*	Description*
077	Horses and camels
0771	Horses
0772	Camels
0773	Sales and purchases during year
078	Chickens
0781	Population
0782	Inputs
0783	Production
079	Other poultry
0791	Population
0792	Inputs
0793	Production
081	Other domesticated animals
0811	Bees
0812	Others (including deer)
09	<u>Machinery and Equipment</u>
091	For holdings
0911	Indication of use, by type of machinery and equipment
0912	Number used and source
0913	Rentals paid
092	For holdings and agricultural service establishments
0921	For machinery owned solely or jointly
10	<u>Buildings and Other Structures</u>
101	Living quarters
1011	General characteristics and agricultural use
1012	Tenure
102	Non-residential buildings
1021	Use and tenure
1022	Physical properties of buildings
1023	Purchases and sales
1024	Construction costs during past year
103	Other structures
1031	Construction costs during past year
11	<u>Ancillary Activities</u>
111	Forestry
1111	Existence of forest trees on holding
1112	Number of forest trees
1113	Area under forest trees
1114	Inputs used during year
1115	Production during year
1116	Sales
1117	Own consumption

Table 5.1 (continued)

Code Number*	Description*
112	Fisheries
1121	Existence of fisheries activities on holding
1122	Cultural installation
1123	Inputs used during year
1124	Production during year
1125	Sales
1126	Own consumption
12	<u>Credit, Marketing, Stocks</u>
121	Credit
1211	Credit activities
1212	Credit received, for each transaction
122	Marketing
1221	Timeliness and sources of inputs
1222	Disposal of products
123	Stocks
1231	Of agricultural products, by product
1232	Of agricultural inputs, by input
13	<u>Prices</u>
131	Prices received and prices paid by farmers
1311	Prices received by farmers, by product sold
1312	Wholesale prices, by product sold
1313	Retail prices, by product sold
1314	Export prices, by product exported
1315	Prices paid by farmers at point of purchase
132	Prices of household consumer goods and services
133	World prices for agricultural products and inputs
14	<u>Post-Harvest Foodgrain Losses</u>
141	At holding
1411	Losses at harvest
1412	Losses at threshing/shelling
1413	Losses at cleaning/winnowing
1414	Losses at drying
1415	Losses in storage
1416	Losses in transport
1417	Losses in processing
1418	Losses in packing and handling
142	By intermediaries
143	At warehouses

Table 5.1 (continued)

Code Number*	Description*
15	<u>Income and Outlay</u>
151	Revenues not covered elsewhere
1511	Rentals received
1512	Receipts for agricultural services rendered
152	Outlays not covered elsewhere
153	Income of household
1531	From the holding
1532	From the agricultural service establishment
1533	From employment outside the holding
1534	From other sources
154	Sales of household property by household during past year
1541	Sale of living quarters
1542	Sale of second-hand durable household goods
155	Miscellaneous household receipts
1551	Inheritance
1552	Other
156	Household expenditures during past year, value and quantity
1561-1562	Food, beverages, tobacco and intoxicants
1563	Fuel and light
1564	Housing and household furnishings and services
1565	Clothing and bedding
1566-1567	Miscellaneous expenditures
1568	Savings
16-17	<u>Other</u>
161	Foreign trade of agricultural inputs and products
1611	Exports
1612	Imports
1613	Foreign exchange
162	National accounts and budget
1621	National accounts
1622	Annual national budget
163	Government land and water development and crop improvement projects
1631	Total cost
1632	Benefits
164	Government-held stocks of agricultural products
165	Domestic manufacturing
1651	Agricultural inputs
1652	Other manufacturing
166	Climatic data, by region
167	Community services available at village level

Table 5.1 (continued)

Code Number*	Description*
168	Technological research information
169	Quality of irrigation water
171	Soil characteristics
172	Agricultural extension
173	Agricultural education
174	Miscellaneous

* The classification hierarchy is indicated for both code numbers and descriptions by levels of indentation as follows:

Category (2 digits)
 Division (3 digits)
 Section (4 digits)