

# Programme for the World Census of Agriculture 2000 (WCA 2000)

Reprinted 1997

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

M-78  
ISBN 92-5-103709-4

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior permission of the copyright owner. Applications for such permission, with a statement of the purpose and extent of the reproduction, should be addressed to the Director, Information Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, 00100 Rome, Italy.

© FAO 1995

## FOREWORD

Since its establishment, FAO has promoted national censuses of agriculture through the 1950, 1960, 1970, 1980 and 1990 Programmes for the World Census of Agriculture (WCA).

The Programme for the World Census of Agriculture 2000 is intended to assist countries by providing definitions, concepts, standards and guidelines for censuses in the decade 1996-2005 in order to generate a data base of internationally comparable figures, such as number of farms by size, number of livestock by type and age/sex classification and land use by crops and agricultural inputs. The Census Programme can be considered as the means to achieve harmonization of national practices: FAO encourages countries to follow the Programme as closely as national conditions and practices allow.

The Programme has been prepared by the Statistics Division of FAO in collaboration with many experienced agricultural statisticians all over the world and has been discussed and elaborated in various international meetings. FAO is grateful to all who have provided inputs and hopes member countries will find it facilitates their conduct of national censuses of agriculture so as to advance their quantified knowledge of the agricultural sector.

The Director  
Statistics Division

## CONTENTS

FOREWORD		Page iii
		<u>Paragraphs</u>
CHAPTER 1 - INTRODUCTION		1.1 - 1.19
Background		1.1 - 1.8
Census of agriculture in an integrated statistical programme		1.9 - 1.16
Basic characteristics of the WCA 2000 Programme		1.17 - 1.19
CHAPTER 2 - INITIAL PLANNING FOR TAKING A CENSUS OF AGRICULTURE		2.1 - 2.7
Developing the census programme		2.1 - 2.3
Organization		2.4 - 2.5
Statement of goals and objectives		2.6 - 2.7
CHAPTER 3 - GUIDELINES FOR TAKING A CENSUS OF AGRICULTURE		3.1 - 3.60
Workplan		3.1
Budget and expenditure control		3.2 - 3.3
Census publicity		3.4 - 3.5
Staff recruitment		3.6 - 3.8
Questionnaire		3.9 - 3.11
Tabulation plan		3.12 - 3.16
Cartographic preparation		3.17 - 3.19
Holding list		3.20
Instructions and training for enumerators		3.21 - 3.22
Instructions and training for supervisors		3.23 - 3.25
Pretesting and pilot census		3.26 - 3.28
Census enumeration		3.29 - 3.31
Data processing		3.32 - 3.51
Quality checks and post enumeration surveys		3.52 - 3.53
Dissemination programme		3.54 - 3.57
Research needs		3.58 - 3.60
CHAPTER 4 - METHODOLOGICAL CONSIDERATIONS		4.1 - 4.32
Objectives		4.1 - 4.7
Census scope		4.8 - 4.12
Statistical unit		4.13
Coverage		4.14 - 4.15
Role of women in agriculture		4.16
Frequency		4.17
Time reference		4.18
Enumeration period		4.19
Complete or sample enumeration		4.20 - 4.24
Census frame		4.25 - 4.32

	<u>Paragraphs</u>
CHAPTER 5 - PROPOSED CENSUS ITEMS	5.1 - 5.137
Introduction	5.1 - 5.4
Category 01: Identification	5.5 - 5.13
Category 02: General Characteristics	5.14 - 5.25
Category 03: Demographic Characteristics	5.26 - 5.35
Category 04: Employment	5.36 - 5.51
Category 05: Land and Water	5.52 - 5.88
Category 06: Crops	5.89 - 5.113
Category 07: Livestock	5.114 - 5.118
Category 08: Machinery and Equipment	5.119 - 5.126
Category 09: Buildings and Other Structures	5.127 - 5.131
Category 10: Other Activities	5.132 - 5.137
CHAPTER 6 - TABULATION PROGRAMME	6.1 - 6.67
General considerations	6.1 - 6.17
Classes for main classification criteria	6.18 - 6.34
Classes for other characteristics	6.35 - 6.64
Check list of cross tabulations	6.65 - 6.67
	<u>Page</u>
CROSS TABULATIONS CHECK LIST	60
REFERENCES	62
APPENDIX 1 - ENVIRONMENT AND SUSTAINABLE DEVELOPMENT ISSUES	63
APPENDIX 2 - INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION OF ALL ECONOMIC ACTIVITIES - Explanatory note on agricultural activities	64
APPENDIX 3 - ALPHABETICAL LIST OF CROPS, BOTANICAL NAME AND CODE NUMBER	66
APPENDIX 4 - CROP LIST	73

*A **Census of Agriculture** is a large-scale, periodic, statistical operation for the collection of quantitative information on the structure of Agriculture.*

*The word "census" implies a complete enumeration of all agricultural holdings. However, by extension, it can be conducted by a sample enumeration, provided the sample is large enough to generate sub-national data.*

## CHAPTER 1

### INTRODUCTION

*Statistics for food and agriculture are very important. Detailed analysis, based on objective, quantitative data, of the structure and performance of the food, agricultural and rural sectors is necessary in formulating sector policies, and preparing, monitoring and evaluating development plans and projects relating to food, agriculture, agrarian reform and rural development.*

*This chapter provides an historical background on the world census of agriculture programme, emphasizes the need for a census of agriculture in an integrated statistical programme, and outlines the basic characteristics of the Programme for the World Census of Agriculture 2000 (WCA 2000).*

#### Background

1.1 By April 1995, 120 countries are expected to have completed, or to be in the process of conducting, an agricultural census for the period 1986-1995 covered by the Programme for the 1990 World Census of Agriculture.

1.2 The Programme for the WCA 2000 will be presented at the 28th FAO Conference to be held in Rome in October 1995. This Programme has been developed taking into account experiences and developments obtained from many national and international experts, agencies and meetings, mainly the 4th session of the FAO/IASI Working group on Agriculture held in 1993 in Buenos-Aires, the 14th session of the African Commission on Agricultural Statistics held in 1994 in Dakar and the 15th session of the Asian and Pacific Commission on Agricultural Statistics held the same year in Manila.

1.3 The Programme for the WCA 2000 recognizes the wide range in the current status of economic and statistical development in different countries, and encourages countries to develop and implement an agricultural census tailored to their unique situation. Nevertheless, the Programme encourages standardization of a minimum core programme for the agricultural census and a complementary relationship between the agricultural census and more frequent food and agricultural sample surveys, all of which should have a recognized role within the overall national survey programme. FAO has developed a document to complement this Programme, named *Taking Agricultural Censuses* which provides technical guidelines.

1.4 The Programme for the WCA 2000 is the eighth decennial Programme. The first and second Programmes were sponsored by the International Institute of Agriculture (IIA) in 1930 and 1940, respectively. The subsequent five Programmes - centred on 1950, 1960, 1970, 1980 and 1990 - were promoted by FAO which assumed the responsibilities of the IIA following its dissolution in 1946.

1.5 The present Programme, like the five previous Programmes, is based on Article 1 of FAO's Constitution, the first paragraph of which reads: "The Organization shall collect, analyze, interpret and disseminate information relating to nutrition, food and agriculture."

1.6 World census of agriculture should not be interpreted as a census carried out simultaneously in all countries during a given year. Such an attempt was made in the 1930 Programme by asking countries to carry out their national censuses of agriculture during 1929 if located in the northern hemisphere, and during 1930 if located in the southern hemisphere. The objective was to obtain global data referring to the same time period. A similar request was made in the 1940 Programme. However, because of difficulties countries experienced in taking the census in the same year, and also because the population census was proposed to be taken in years ending with 0, this request

was later relaxed. For example, the 1990 Programme covered national censuses taken during 1986-1995.

**1.7** The 1930 Programme was promoted at a time when there was a large gap in agricultural information and data sources for agricultural statistics were not well organized, even in developed countries. The agricultural census was expected to help fill this gap. However, due to its wide scope and emphasis on agricultural output, many countries experienced difficulties in taking their first national agricultural census. Adequate resources for maintaining a large field staff were not easily obtained, their recruitment and training were major concerns when professional staff were limited in number, and completing long questionnaires fatigued both enumerators and respondents. Ensuring data quality was a major problem; even if this was achieved data processing in the pre-computer era was excessively time-consuming leading to belated release of results. All-in-all the whole operation proved to be beyond many countries' capacities.

**1.8** Taking these experiences into account, the 1950 Programme proposed a more restricted scope, concentrating on structural aspects of agriculture. The 1960 to 1990 Programmes gradually re-expanded the census scope while keeping agricultural structure as the principal theme. Some countries again experienced difficulties as the scope expanded although others conducted agricultural censuses with an even wider scope.

### **Census of agriculture in an integrated statistical programme**

**1.9** Not all food and agricultural statistics can be collected through a decennial census of agriculture. Most obviously, there is a need for annual estimates of production. As early as 1966, attention was drawn to establishing an integrated set of data sources with the census of agriculture as an important component (FAO 1968).

**1.10** The 1989 World Conference on Agrarian Reform and Rural Development (WCARRD), urged countries to develop socioeconomic indicators for monitoring and evaluating programmes on agrarian reform and rural development, thus placing even greater demands on national statistical capabilities. The need for a complete system of food and agricultural statistics, with reference to various data sources, is stressed in FAO publications. Primary data sources include the agricultural census, population census, industrial census and sample surveys such as those on agricultural production, livestock, farm management, post-harvest losses, food consumption, household income/expenditure, and labour force. Administrative records, local community records, technological research and international statistical publications are cited as secondary data sources. These and other sources, some beyond the domain of agricultural statistics, contribute to the data pool needed for a national information system on food and agriculture. Emphasis in these publications focuses on linkages between these data sources, with the following aims:

- (a) Concepts, definitions and classifications compatibility.
- (b) Optimizing the use of available statistical resources.
- (c) Restricting any one census or survey to a coherent and manageable range of data items.
- (d) Reducing the incidence of the release of conflicting statistics.
- (e) Providing all data needed for comprehensive analysis.
- (f) Ensuring full processing, analysis and user availability of collected statistics.

**1.11** Continued emphasis is placed on the need for countries to prepare a multi-year plan for a sequential statistical programme of activities relating to data collection, processing and analysis, and to allocate adequate resources in a balanced manner for the components of the programme. The totality of these activities and the agencies conducting them is referred to as the integrated statistical programme component of a national information system for decision-making in food, agriculture and rural development. Thus, a programme for a national census of agriculture should be conducted during 1996-2005 within the above framework using this Programme for the WCA 2000 as a guideline.

**1.12** Planning and implementing a sequence of coherent statistical activities require an efficient organization, trained personnel at various levels, and secured budgetary allocations over a period of



years. Efficient organization implies strong cooperation between both users and producers of statistics. As different statistical activities are not necessarily all under the jurisdiction of a single government institution, establishing coordination among various agencies is sometimes difficult because they may have different mandates regarding the purpose, scope and timing of their work. Countries which are still experiencing a shortage of trained statistical personnel and/or insufficient funds for statistical development will require time to achieve an integrated statistical programme. Nevertheless, it is recommended that all statistical development efforts should be oriented toward the long-term goal of establishing such a programme that will eventually provide a continuous flow of timely, accurate data covering all relevant aspects of food, agricultural and rural development. Needless to add that those few countries that have a programme which delivers the information needs efficiently will find the requirements of WCA 2000 incorporated within their existing arrangements.

**1.13** A census of agriculture, due to its decennial frequency, is best suited to collecting data on various characteristics relating to agricultural holdings that change only slowly over time. This limits the desirable scope of the agricultural census to the number and size distribution of agricultural holdings by type of enterprise. These attributes are referred to as the structure of the agricultural production sector. Types of enterprise included in a census of agriculture are generally related to the resource base, e.g. agro-ecological zones, technology such as power sources, machinery and equipment, land improvements, crop-livestock rotations and general source of soil nutrient improvements such as organic or chemical fertilizers. Other structural classifications may relate to the educational level of the farmer and farm labour inputs, the legal status of the holder including tenure arrangements, and other social and demographic characteristics of holders.

**1.14** Structural data will not allow analysis of the performance of the agriculture sector - this requires data on prices and quantities of inputs and outputs, enterprise costs and returns and net farm income. Data on performance and complementary data on variables such as food prices, consumption and nutrition which change rapidly over time can best be collected through frequent sample surveys.

**1.15** A census of agriculture is distinguished from sample surveys by its extensive, even if not total coverage of holdings. When a complete enumeration is possible, a census of agriculture provides a frame for later sample surveys to provide the performance data. The agricultural census also provides structural data for individual small areas (communities, administrative units and agro-ecological zones) which are needed in the preparation of plans and policies for rural development. The census is the only basic data source for the structure of specialized holdings (such as those equipped with greenhouses), and again, provides a frame for sample surveys of such specialized features. The agricultural census is also useful in identifying disadvantaged groups (such as subsistence farmers and female holders) who need to be assessed separately in policy formulation in order to ensure their levels of living are improved.

**1.16** Two points need to be emphasized when considering the scope of the agricultural census. First, the census involves collecting, processing and analyzing data from a very large number of holdings so the coverage for each holding must be kept simple and succinct. Second, since the census statistical unit is the agricultural holding, structural data related to other units, such as agricultural service establishments or seasonal and occasional workers, should be left to other data sources.

### **Basic characteristics of the Programme for the WCA 2000**

The Programme for the WCA 2000 has three basic characteristics:

**1.17** First, uniformity in concepts, definitions and classifications with those from other data sources. To the extent possible, these criteria used in the census are compatible with those recommended by other UN organizations. For example, the definitions adopted in this document for such concepts as household and occupation conform with those recommended by the UN Statistical Division.

**1.18** Second, the data coverage within the agricultural census (as detailed in Chapter 4) should be limited. Given the scale, resource requirement, field management and enumeration skills and data processing implications this limitation is essential if the success of the census is to be ensured.

**1.19** Third, in relation to the previous WCA Programmes, changes have been kept to a minimum. Some changes are necessary to reflect current priorities and to improve the presentation. New to the WCA 2000 are basic items that address gender and environmental issues (see Appendix 1) and reference to the need for geo-referencing data.

## CHAPTER 2

### INITIAL PLANNING FOR TAKING A CENSUS OF AGRICULTURE

*Considerable financial and resource funding is critical for a successful census of agriculture. This chapter identifies the basic steps in the initial planning and organization of such a census. Endorsement of basic goals and objectives from cabinet ministerial level, or its equivalent, is required to ensure the commitment of resources and to provide authoritative support during the lengthy period of planning, data collection, processing, and dissemination.*

#### Developing the census programme

**2.1** The census of agriculture is but one of the data sources within a national statistical programme for food and agriculture. Countries are recommended to prepare this national programme before embarking on a census, and to view the latter as one important activity in a continuing cycle of statistical development. Such an approach will help to overcome many of the issues discussed in this chapter.

**2.2** It is recommended that countries examine carefully the list of census items provided in this Programme. Such examination will not only assist in clarifying the census scope, but will indicate how the census may complement other existing data sources. Countries that have not yet established a satisfactory national statistical programme for food and agriculture should resist the temptation to widen the census scope beyond its structural boundaries.

**2.3** An important issue is the establishment of a legal base for conducting the census. This may be in the form of a law, decree or other instrument, depending on the legislative procedures of the country. Census legislation is required to identify the various responsibilities of government agencies and respondents and to serve as a base for budgetary allocations. Government agencies should guarantee confidentiality of the data collected from individual respondents. This guarantee helps to obtain respondents' cooperation. Countries are thus recommended to review their legislation on data collection activities to ensure it provides a coherent legal base for a national food and agricultural statistics programme, which includes the agricultural census.

#### Organization

**2.4** An inter-ministerial committee should be established to be responsible for the overall advisory role in the conduct of the census. This committee could be the central coordinating body of the national food and agricultural statistics programme, or one of its sub-committees, but should in either case include representatives from producer and user agencies. Membership in such a committee involves responsibility and time-consuming work and it is preferable to restrict membership to people who are actively concerned with the census. The committee should carry out the following activities:

- (a) Determine the census scope.
- (b) Periodically review progress with census operations and advise government authorities on needed steps and measures to facilitate it.
- (c) Approve publication of census results.
- (d) Advise on evaluating the census programme.

The census committee may carry out its functions through specific sub-committees or technical working groups.

**2.5** An agency responsible for conducting the census should be designated. This agency will execute the census with assistance from other agencies under the general guidance of the census

---

committee. The organization may include support from provincial and/or district level administrations to oversee field work of supervisors and enumerators.

### **Statement of goals and objectives**

**2.6** A list of basic goals and objectives is essential in planning, collecting, processing, and disseminating the results of a census of agriculture. These goals and objectives need to be endorsed at a cabinet ministerial level or its equivalent if the census is to be guaranteed the required government support.

**2.7** Realistic, broad based goals and objectives will ensure the best utilization of resources in planning and executing a census of agriculture. The statement of goals and objectives will serve to provide the parameters for committees and official bodies responsible for budgeting, planning, and implementation of the programme. The goals and objectives should include the time frame within which results are to be produced and the need for efficiency in minimizing census costs.

## CHAPTER 3

### GUIDELINES FOR TAKING A CENSUS OF AGRICULTURE

*This chapter presents basic principles for planning and carrying out an agricultural census. It provides a check list of major aspects rather than an exhaustive detailed description. Steps covered include the work plan from which budget and staffing estimates are generated.*

*In addition to budgeting and staffing the chapter includes information on tabulations, the questionnaire, cartographic preparation, and the importance of frames (list and area).*

*The chapter continues with information on pretesting, pilot censuses, data collection, instructions on training and monitoring the work of enumerators and their supervisors. A summary of data processing and dissemination issues is provided, concluding with notes on related research activities.*

#### Workplan

**3.1** A detailed workplan should be one of the first census activities. The workplan defines the detailed activities in a logical sequence and includes staffing and resource estimates for each phase of the census process. Budget estimates, staffing requirements, equipment and supply needs will all be derived from the work plan and planning and monitoring will be based on it. The workplan should be built with a realistic time schedule for each activity in chronological sequence and show the relationship between the various phases of the operation.

#### Budget and expenditure control

**3.2** An agricultural census budget should be prepared covering all census phases from the preparatory work to publication of results and installation of all data in a user-oriented data system. The budget should show, for each fiscal year, permanent and temporary personnel required, salaries and wages, travel costs and expenditures for acquisition and operation of machinery, stationery and other supplies, and office space, communications, transport etc. with provision made for unforeseen expenses. The agency legally responsible for executing the census should be empowered to reallocate resources in case of unforeseen difficulties, especially during data collection and data processing.

**3.3** The budget for data collection, processing and dissemination should show the volume of work to be performed, performance rates and measurable costs of all activities in the work programme. The budget should be reviewed periodically and work accomplishments compared to budget expenditures. Corrective action should be taken when necessary.

#### Census publicity

**3.4** Census publicity is very important. Experience shows that inadequately informed and hence uncooperative citizens may jeopardize the entire census. The purpose of publicity is to bring the census to the attention of all agricultural holders, or at least to one family member thereof. The scope and coverage of the census should be clearly explained in the national and local press to familiarize people with the type of questions to be asked. The publicity programme should explain the uses to which the data will be put, particularly for development planning and formulation of agricultural policies; making the census meaningful to people, and highlighting, in particular, the possible benefits to farmers, thus establishing confidence between people and census authorities. The confidential treatment of data collected and the need for accurate replies should also be emphasized. Included

in the publicity is a special need to stress women's involvement both as holders and in holding operations and the importance of their support in participating in the census.

**3.5** The best means of achieving effective publicity will vary from country to country. In many countries, press, cinema, radio, television and posters are used. In others, the publicity has been targeted at local religious and community leaders, business associations, labour groups, women and familial organizations and public service organizations. The cooperation of such organisations has proved to be the key to success. School publicity programmes may be efficient because schoolchildren are apt to pass information to and influence their families. The national or local census committee can also play an important role in the publicity campaign. In some countries, committees have been organized in villages to read and explain census publicity material to illiterate farmers. The use of audio-visual aids under such conditions may be helpful.

### **Staff recruitment**

**3.6** Senior administrative and professional staff need to be highly skilled and qualified, recruited from personnel familiar with agriculture, census methods and procedures, and government work. Supervisory personnel for enumerators can be recruited or borrowed from government agencies or local sources, such as statistical and agricultural extension services and educational organizations. Such personnel need to be intimately familiar with local conditions, customs, transportation systems, dialects and other relevant facts. Effective enumerators should be recruited independent of sex; but in some societies it may be necessary to use female enumerators to interview female holders.

**3.7** Enumerators are best recruited from the localities in which they will work. They should undergo simple tests designed to measure their ability to read and apply instructions, understand maps, communicate easily with people, enter information on questionnaires accurately, and perform simple arithmetical operations.

**3.8** Successful enumerators are tactful and resourceful in handling problems that arise when meeting and talking with holders and others; their actions and attitudes should gain the respect and confidence of those they encounter. They must be willing and able to work full-time, without engaging in other activities, until the job has been completed. They must work carefully and diligently and always maintain required records.

### **Questionnaire**

**3.9** A questionnaire is the medium for recording, in a standardized manner, the data obtained in censuses and surveys. Development of the census questionnaires is an important and exacting task in census preparation. Final data quality depends largely on the questionnaire design and the selection and training of enumerators.

**3.10** Constraints during enumeration and the required format for tabulation of the data must be kept in mind when designing the questionnaire. It must use unambiguous concepts and definitions easily understood and clearly explainable by enumerators to the respondents. The questions must be simple and plainly phrased. The questionnaire aims to provide a standardized interpretation of the meaning of census items and data to be collected. Countries using computer assisted interviewing techniques, i.e. hand held computer devices for field enumeration, will find planning the questionnaire even more demanding.

**3.11** The questionnaire must be prepared sufficiently in advance of commencement of the enumeration to permit adequate pretesting, and enumerator training; also the early finalization of the questionnaire is required in order to finalize the tabulation programme and start programming for data processing. A major objective of pretests is to ascertain deficiencies in the questionnaire and any problems holders have in responding to it so that revisions can be made prior to enumerator training.

## Tabulation plan

**3.12** The design of the questionnaire crucially affects the tabulation programme. Experience shows that often data are recorded on the questionnaire in such a way that they cannot be readily extracted for processing and tabulation, involving extra expense in time and resources. Countries are recommended, therefore, to prepare the tabulation programme concurrently with the final stages of questionnaire design.

**3.13** It is necessary, during initial consideration of the tabulation programme, to decide upon the number of tabulations to be produced at various levels of aggregation according to administrative units and agro-ecological zones. Few countries can expect the tabulation programme to provide statistics for every village or commune. Further limitations on area and zone levels are imposed when the census is taken through sample enumeration.

**3.14** Another important tabulation programme consideration is the choice of class boundaries and/or size criteria to be adopted for classification purposes. Explanations in Chapter 6 provide guidance on this subject. Countries are encouraged to adopt for each characteristic the classes set out in this Programme so as to produce internationally comparable results. Countries that expand the agricultural census scope beyond the items given in Chapter 5 may find it useful to adopt a size classification based on area irrigated, total value of products sold or consumed by the holding, or on value added, depending on relevant data collected in the census.

**3.15** There is increased interest in tabulating certain characteristics of holdings by various types of farming. Countries where farm typology is established may find it useful to obtain the same set of cross tabulations for each type of farming in order to make comparative studies.

**3.16** The overall tabulation programme must be assessed in terms of resources available to process the data to avoid undue delays. Some prioritization of tabulations may be necessary.

## Cartographic preparation

**3.17** Enumerating all, or a large sample of, agricultural holdings in a country, without omission or duplication, in a short period of time, requires utmost attention to all the details. The exact delineation of each enumeration area is necessary and each enumerator should be provided with an enumeration area map showing the exact boundaries. In addition, supervisors and local offices should have copies of these maps for their respective enumeration areas.

**3.18** Census authorities should investigate availability of cartographic resources at an early stage of census planning. Sources include maps, topographic charts, aerial photographs or satellite images.

**3.19** Where maps, satellite imagery, or aerial photographs are not available and the agricultural census is undertaken on a sample enumeration basis, a complete list of villages or other identifiable geographic units should be prepared in advance. The list should include, as far as possible, complementary data on size of villages or units such as agricultural population or people engaged in agriculture, population of ethnic groups, total area and agricultural land area, main crops and agricultural practices, and facilities including water availability for irrigation and agricultural machinery. These data are useful for stratification purposes which will improve the efficiency of the sample design.

## Holding list

**3.20** The listing of all holdings within each enumeration area is another important and difficult agricultural census operation. This refers to screening the entire population within the area with a short questionnaire requesting information on area cultivated, animals kept and responsible person(s) in order to arrive at the list of agricultural holdings to be enumerated. Lists of holdings or holders available at administrative offices are frequently incomplete and out of date and unsuitable for census enumeration. Listings from a population census taken shortly before the agricultural census are an

important source to provide a first draft listing that can be used in the screening to identify holders. Countries without maps or independent sources will be well advised to include a few screening questions on the population census questionnaire. Some countries lacking the above sources may have to prepare for each selected enumeration area a new listing of households and holders within households in order to identify the holdings.

### **Instructions and training for enumerators**

**3.21** Country experience indicates that it is essential to provide instruction manuals and extensive training for census enumerators to standardize procedures, secure a common understanding of tasks to be performed and provide a reference guide during enumeration. Instruction manuals and enumerator training programmes are essential because census data quality depends primarily upon the enumerators. There is a risk that all efforts and investments made for the census will fail if adequate training is not given. Instruction manuals should contain detailed explanations of procedures for conducting the enumeration, interview techniques, guidance on how to handle major and frequently encountered problems (such as uncooperative holders), and examples of properly completed questionnaires. Preparation of these instruction manuals is a high priority task and should be the responsibility of persons with a thorough knowledge of census design, holders' characteristics and interviewing techniques and with wide experience in preparing such manuals. Training should be carefully organized and conducted within an appropriate time schedule.

**3.22** Enumerator training should cover:

- (a) The objectives and goals of the census and why these are important.
- (b) General information:
  - (i) detailed job description and the terms of employment;
  - (ii) the scope of responsibility carried by the enumerator;
  - (iii) how to identify and deal with holders and their families (including overcoming sex-stereotyping);
  - (iv) the importance of confidentiality of data.
- (c) The management and conduct of the census:
  - (i) details of data to be collected;
  - (ii) details of how the census is organized, the management, supervision and logistics of the operation;
  - (iii) when and how the census is to be taken.
- (d) Definitions and procedures (including extensive practice field work):
  - (i) definitions and concepts;
  - (ii) introductions and making appointments;
  - (iii) from whom to obtain data;
  - (iv) techniques for conducting a good interview;
  - (v) completing questionnaires;
  - (vi) checking questionnaires;
  - (vii) calling back to obtain missing data and ensure coverage;
  - (viii) overcoming community resistance and holders' objections to responding;
  - (ix) use of interpreters;
  - (x) how to take objective measurements (if relevant).
- (e) Administrative instructions:
  - (i) time management and hours of work;
  - (ii) procedures when absences from work are unavoidable;
  - (iii) pay and allowances;
  - (iv) arrangements for supervision and contact on other administrative matters;
  - (v) record keeping required on time and attendance.



## Instructions and training for supervisors

**3.23** The supervisors' work in overseeing enumerators' work and assisting them to solve problems encountered is essential to the census success. The supervisor's presence and inspection of enumerators' work helps prevent carelessness, and facilitates error detection and correction while enumeration is in progress. Supervisors should encourage enumerators to perform acceptable work, ensure they complete work assignments on time and help enumerators to promote holders' cooperation. Supervisors should follow and record enumeration progress, and take appropriate action when work is not performed in accordance with instructions or according to a prescribed time schedule. Good supervision is a proven and worthwhile investment; one supervisor for a reasonable number of enumerators is fully justified by improvement in work quality ensuring data accuracy and completion of work on schedule. The best supervision is achieved by constantly working in the field with enumerators. The supervisor should be present at several initial interviews, to detect deficiencies and take immediate remedial action. Subsequent regular visits should be organized to observe at least one interview and inspect a sample of completed questionnaires for completeness and internal consistency. When the enumerator has completed one work phase in a locality, the supervisor must review the enumerator's work, ensuring that all households have been accounted for, all holders interviewed and all questionnaires properly completed. Omissions must be detected and visited and unsatisfactory interviews may need to be repeated, if necessary with the supervisor's assistance.

**3.24** In view of their important role, supervisors should be selected preferably among candidates having field experience in similar activities and undergo an intensive training programme combined with field work. This training programme should include the full training course provided to enumerators (see paragraph 3.22 above) and, in addition, supplementary training on the following subjects specific for the work of supervisors:

- (a) General Supervisory work:
  - (i) supervisor's responsibilities and role within the census management;
  - (ii) how to read and check area maps;
  - (iii) how household or holder lists are prepared and used;
  - (iv) organization of field editing and aggregating completed questionnaires;
  - (v) periodic progress reporting.
- (b) Supervision of enumerators:
  - (i) recruiting and selecting enumerators;
  - (ii) conducting training sessions for enumerators;
  - (iii) observing the enumerator at work;
  - (iv) reviewing questionnaires and other records prepared by enumerators;
  - (v) recording and making periodic appraisal of enumerators' work;
  - (vi) handling special problems encountered by enumerators;
  - (vii) taking action required to replace enumerators;
  - (viii) taking appropriate action when work is not completed satisfactorily;
  - (ix) handling cases of community resistance or holders' refusal or unwillingness to provide required data.

**3.25** Omissions in the list of holdings require special supervisory attention. In many countries, significant listing errors result from difficulties in identifying households along the enumeration area borders. If the map or locality sketch map does not clearly distinguish boundaries by natural features, the supervisor should check carefully the accuracy of listings on the enumeration area perimeter.

## Pretesting and pilot census

**3.26** Pretesting involves enumerating a very limited number of holdings. The pretest collects evidence, through interviews and/or objective measurement techniques, of the adequacy of various census procedures. Pretesting alternative census methodologies, the questionnaire, and enumerators' instructions are vital and no census should be undertaken without it. Pretests must be performed exactly as prescribed for the main census enumeration. Some purposes of pretesting are to:

- (a) Provide evidence on the adequacy of time allocated for each part of the census programme.
- (b) Indicate the questions, definitions and procedures not fully understood by enumerators.
- (c) Measure how well enumerators perform their duties after training.
- (d) Measure enumerators' ability to communicate to holders census objectives and content.
- (e) Measure holders' abilities to provide qualitative and quantitative answers.
- (f) Indicate which questions holders do not fully understand.
- (g) Identify questions the answers for which are not known.
- (h) Ascertain the feasibility of complete enumeration or using the size of sample chosen.
- (i) Estimate time required for various activities to be carried out by enumerators.
- (j) Ascertain the feasibility of complete enumeration or using the size of sample chosen.
- (k) Provide sample data required for testing computer programmes and other data processing operations.

**3.27** Quality control records of enumerators' activities during the pretest should be kept, preferably by supervisors or staff members without training responsibilities. Such records should include the number and type of errors made by each enumerator and the time required for each operation or part of the training programme. Summaries of time used and problems recorded during pretesting should also be prepared. These records and written suggestions from supervisors and staff members participating in the pretest provide the basis for revising the questionnaire or instructions to enumerators.

**3.28** Pretesting may involve a pilot census which is a pretest of sufficient size and design to fully test procedures, forms, and systems to be used in the census. It is designed to provide information on all phases of a programme from the effects of pre-publicity to tabulation of data. A pilot census is a final test of the census programme, used to detect and correct any weakness in the programme before the actual census or sample enumeration is conducted. If considerable changes are made in the programme after a pretest, a second smaller test may be required.

### **Census enumeration**

**3.29** In an agricultural census, data are collected through interview and/or by mail. In the interview technique, the enumerator visits the holding, interviews the respondent and records the responses on the questionnaire. Interviews may be supplemented by observations or measurements carried out by the enumerator. Interviewing is the method adopted in most developing countries where postal services are not fully developed and the literacy rate is low.

**3.30** Using the cheaper mail approach, the questionnaire with explanatory notes is mailed to the holder, usually with a stamped preaddressed return envelope. Reminders may be necessary to increase response rate.

**3.31** Interview and mail techniques are sometimes used to complement each other. Interviewers are sent to a sample of holders who have not responded even after receiving reminder letters. Sometimes data are collected from registered holders and institutional holdings by mail and enumerators are sent to other holders. Each country must decide its own technique, based on local conditions and available resources.

### **Data processing**

**3.32** Early preparation - Data processing is an important phase of the agricultural census requiring adequate planning and preparation. Such planning and preparation should include hardware acquisition, personnel training, participation of data processing experts in questionnaire design, and writing computer programmes prior to enumeration. Specifically, a detailed tabulation plan and instructions for manual and computer data editing should be finalized early enough to make possible an efficient organization of data processing. Since the quantity of data to be processed is large, insufficient preparation causes long delays in obtaining census results.

**3.33** Modern basic guidelines are oriented to electronic data processing. Countries without computer facilities may need to further restrict the census scope and/or limit the number of units covered. A combination of manual and computer processing may be appropriate for a few countries. For example, a number of preliminary data processing operations, including preliminary editing of questionnaires and preparation of district or provincial totals for some important census items, may be undertaken manually by qualified field staff in each administrative district or province. However, with the rapid advances in low-cost powerful small computers, each country undertaking an agricultural census should obtain some type of appropriate computer capability. It is one of the most effective resource expenditures a statistical organization can make, beyond basic organization, staffing and training. Computer processing equipment may also be available in provincial statistical offices, which allows for data processing to be decentralized.

**3.34** Whereas data processing details will depend upon the equipment and software packages available for the purpose, a number of operations are common. The most important of these are briefly described below.

**3.35** Maintaining control of questionnaires - Controls should be established to ensure that questionnaires are received from every enumeration area and every enumerator. Questionnaires should be grouped so that such controls are simple and not too time-consuming. Questionnaires for large or special holdings within a province or state might be batched together. All questionnaires for one enumeration area covered by a single enumerator should also be batched together. Records need to be kept of the flow of batches of questionnaires through the various processing steps and should be checked periodically to detect delays, misplacement of questionnaires, etc.

**3.36** Checking for enumeration completeness - Questionnaires for large holdings must be checked against the complete list of such holdings and action should be taken to obtain missing questionnaires. Questionnaires for each enumerator must be checked against the holding list for the enumerator's area, and a satisfactory explanation sought for missing questionnaires. Adequate field organization, including supervision of enumerators' work and questionnaires received in each district and province, will appreciably reduce work in the central office.

**3.37** Checking for questionnaire completeness - A visual check should be made to ensure that each questionnaire has entries in essential sections (land use, livestock, etc.). Questionnaires lacking essential entries should be referred back to the originating office for action. Questionnaires for large or special holdings should be reviewed for completeness by professional staff. Again, efficient control of field work before completed questionnaires are sent to the central office is essential. The speed and accuracy of data processing will be greatly influenced not only by the accuracy but also the legibility of the questionnaires sent in. Enumerators must be trained to write clearly.

**3.38** Verifying office processing - Some verification of data processing work should be performed. Complete or sample verification of data entry and other routine operations is important. Training of processing staff must take into account the time needed by data entry operators or clerical personnel to acquire the skill and practice required in order to perform the work at relatively stable quality and acceptable error levels. Complete verification is costly and does not detect all errors, although computer editing has advanced the possibilities of such complete checks. Once a data processor produces work of satisfactory quality, verification of a sample of the work is sufficient to ensure quality standards are maintained. Similarly, controlling errors at the work unit level can be achieved by verifying small samples, accumulating verification results and comparing cumulative results with acceptable standards. If a work unit does not meet the required standards complete verification of the output is necessary with correction of errors and retraining of staff. Normally, when work units meet quality standards, errors detected in sample verification processes are not corrected.

**3.39** When the census is based on sample enumeration, verification of the data at each process is even more important than for complete enumeration. Complete verification of data is preferred.

**3.40** Countries where provincial offices are involved in the processing will have some of the functions listed above. The necessary controls must be rigidly applied in provincial offices as in the central office.

**3.41** Computerized data processing requires various routines to have been decided in advance: precoding of questionnaire items; types of corrections to be made during questionnaire verification; coding of the data; correcting errors detected during data entry operations; and the tabulation plan. This advance work requires experienced agricultural statisticians to work with computer system analysts and programmers during the census planning operations.

**3.42** The success of data processing depends on:

- (a) Making provision for the processing of census data within the overall plan for data processing built into the national statistical programme.
- (b) Preparing outlines of all statistical tables (stubs and headers) concurrently and in coordination with the preparation of the questionnaire.
- (c) Preparing computer programmes, selecting, purchasing and installing software packages for modifying (or initiating) the data system to accommodate any new census needs, including user access to census data after the basic census operation is complete, and thoroughly testing them before data collection begins.
- (d) Requiring the computer system analysts and programmers to fully document all programmes, so that they are transparent to later users.

**3.43** Preparing computer programmes - Considerable time is required to write computer programmes for tabulation, error identification and error correction. Available software packages should be carefully studied for their possible installation and use to perform these activities. After the selected software packages are installed or the computer programmes prepared, they should be tested with data from pretest surveys and pilot census. Computer printouts should be run to identify errors and corrections. If errors remain uncorrected additional specifications are required.

**3.44** Once census questionnaires are received a further test of the computer programmes should be carried out using a sample of, say, 100-500 questionnaires. The resulting tabulations should be compared with a manual summary and against each other to ensure consistency across sets of tables.

**3.45** Error detection and correction by computer include measures to deal with missing and impossible entries which are beyond normal ranges in the values entered and data inconsistencies. Generalized edit and imputation algorithms are used to impute values to replace erroneous entries. The design of data entry, editing and correction programmes should be based on a set of tests and procedures defined jointly by statisticians and data processing specialists. Caution must be exercised to ensure that these procedures do not falsify data. Parameters used for editing such as minimum and maximum acceptable values should be carefully determined, based on pilot census and/or other independent data sources in order to avoid eliminating valid entries. If missing data is insignificant, it may be preferable to tabulate them under holdings not reporting rather than imputing values. A record should be retained of the number of cases imputed or changed.

**3.46** Some common types of automatic error detection include:

- checks for missing entries;
- checks for inadmissible entries (for example, age of holder below minimum specified, crop codes that do not appear on the definitive list of codes; data outside specified limits e.g. yield of specified crops);
- checks of totals (for example, total area reported under different land use classes should be equal to total area of holdings).

**3.47** Census data processing requires time, often more than a year, to complete. Steps should be taken to obtain priority data in advance of other results by planning the tabulation programme in two or more phases. Even earlier preliminary estimates of high priority data may be obtained by tabulating a sample of the census data as a first stage. Advance tabulations can be supplemented by manually compiled aggregates of main census items. Enumerators may prepare enumerated holding aggregates on summary sheets; these can be further aggregated by administrative areas in districts and provinces, while corresponding national and other totals may be prepared and issued

by the central office. It is important, however, that procedures should be developed for processing all the data. If much of the data remain unprocessed after some years the effort that went into the data collection will be deemed to have been wasted and the policy analysts or planners needing such data will be less likely to support future census efforts.

**3.48** Census processing no longer requires main-frame computers. Micro-computers are now very effective for data processing of large data files and have a number of advantages over large main-frame computers. First, they are less costly and are physically easy to transport and install. Second, they are user friendly and a wide range of software applications are tailor-made for use on them. Third, it is possible to dedicate micro-computers totally to census work, whereas this is generally impossible with a main-frame computer serving many users for different purposes with priorities often given to non-census applications.

**3.49** The number of micro-computers or work stations required and compatibility with other available equipment need to be carefully planned. A micro-computer system compatible with larger centralized computers can be used to decentralize and speed-up data entry and checking for later processing on a central computer. Prospects of using the micro-computer system for projects following the census will add value to the purchase of a system. Other important factors to consider before acquiring a system include ensuring adequate software is available, ensuring service and support for the system is available, and that the power supply is sufficiently reliable to avoid the risk of damage to the computerized data files.

**3.50** Despite precautionary measures taken in the course of data processing, some errors will remain and be incorporated into census tables. The effect of these errors may be considerable and all tables should be systematically reviewed before publication, to eliminate or at least minimize the effects of errors. Various methods can be used to carry out this review. An essential procedure is a consistency study of census data compared with statistics on the same subject available from previous censuses and surveys. Agreement between old and new data obviously does not establish the accuracy of either. The same applies for internal consistency checks. However, if there are no major discrepancies, the data can be released. Should large discrepancies be discovered, further investigation is necessary and verification of original data may be required to ascertain the error source. Another useful step involves breaking down basic aggregates by various administrative units and comparing the subaggregates with analogous data and statistics from other sources, including professional judgement.

**3.51** Table review should not delay publication: knowing the tabulation programme, existing statistics can be studied beforehand. Thus, a quick review of the tables is possible as they are produced. Results of quality checks made during and after field enumeration can be fully utilized in the final evaluation of census tables. Quality checks may reveal major gaps in the enumeration, certain categories of holdings or particular areas of the country. In such an eventuality tabulations to be released may need to exclude such categories or qualify their entries with cautionary footnotes pending further examination leading to correction in the final census report.

### **Quality checks and post enumeration surveys**

**3.52** Non-sampling errors may arise from numerous sources. The census frame or list of holdings may be incomplete or inaccurate; the wording of questions ambiguous or misleading; enumerators may introduce their own biases; respondents may not really know the true answer, or cannot recall the data requested, and others may consciously answer incorrectly; field work may be inadequately organized or supervised; enumerators may lack specific training or unsatisfactory standards may have been used for their selection; completed questionnaires may be lost. Specifically the following error types commonly occur during field work and need to be kept in mind during field and office checks:

- households or holdings are omitted during listing;
- household, or holders are absent at time of enumeration;
- failure to identify all the holders in a household;
- failure to record data for all parcels in holdings, particularly when some parcels are located in another locality;

- omissions by holder, due to lapse in memory or for other reasons;
- failure to obtain correct area because actual area may not be known to holder;
- land incorrectly identified due to misunderstanding of definition of land use;
- inaccurate crop areas where mixed, associated and successive cropping methods are used;
- failure to report livestock which is temporarily away on public or common pastures, or in transit outside holding;
- failure to report use of jointly owned agricultural machinery;
- recording responses from respondent incorrectly on the questionnaire.

**3.53** Efforts to reduce errors arising from all field work sources and data processing stages have been emphasized in the earlier sections of this chapter. One further stage may be required, namely the carrying out of sample enumerations as quality checks during or just after the main census enumeration. Statisticians have an obligation to their profession and to data users to undertake these checks. Such post-enumeration checks may represent the only serious attempt to obtain evidence of census methodology deficiencies, types of errors occurring, and magnitude of such errors. Such evidence provides a concrete basis for overall improvement in survey methods and the elimination or reduction of errors and biases. The publication *Quality of Statistical Data* (FAO 1966), contains detailed information on the control of non-sampling errors.

### **Dissemination programme**

**3.54** Census taking uses public resources and the published results represent the public return of a major product from this expenditure. Primary tables easily summarized should be published as early as possible. Immediately following this, a schedule of publication results should be organized with wide dissemination of these results.

**3.55** A general census report, prepared by professional staff, may be issued in several volumes. The report should include, in addition to statistical tables, all information that might be useful to better understand and evaluate the data. Details of organizational and administrative aspects of the census should also be included as they may be useful in preparing and implementing future censuses. The report may also include material on objectives, legal authority and administration, scope and coverage, essential definitions, concepts and classification, assessment of reliability of results, copies of questionnaires, summary of main instructions for enumerators and supervisors, data collection methods, data processing and tabulation methods, description of administrative and agro-ecological zones used, and comparisons with statistics from prior censuses or other sources. The report should also provide all relevant sample design details where samples were used, particularly those discussed in the United Nation's publication on preparation of sample survey reports (UN 1964).

**3.56** The dissemination programme including the publication list is as important as other components of census operations. Availability of computers and feasibility of storing primary data permit utilization of results in a variety of ways in addition to those included in main census publications. The micro data within a census file contains a wealth of information awaiting further use. Short reports with graphics of data reflecting changes in structure or new trends can be very important in exposing the value of information in the data base. The data dissemination plan should consider the need to get basic data in the hands of data users as early as possible.

**3.57** When preparing the reporting and data release schedules the following should be kept in mind.

- (a) The priority tables should be released as soon as possible. These should include data from all holdings enumerated but with limited cross-tabulation and possibly in different volumes so that more important data are available very early. With availability of micro-computers a cheap and efficient way of disseminating data is to make available census results in the form of diskettes (CD, floppy, etc.).
- (b) Further analysis should proceed including:
  - additional cross-tabulations,
  - making available disaggregated data to users, for special analysis;

- 
- making available facilities for the production of special tables requested by users, including provision of cross-tabulations for small areas, below the level released in the census report.
  - (c) Notwithstanding the above, measures should be taken to safeguard data confidentiality, particularly when data refer to individual or small areas. Moreover, as users become more computer-literate there is a danger of excessive demands for cross-tabulations at highly disaggregated area levels which are below the level that professional statisticians would accept as valid.

### **Research needs**

**3.58** Well conducted research studies furnish, for each alternative data collection technique, an assessment of corresponding cost and resource requirements, needed qualifications of enumerators, relevant difficulty of different procedures, etc. The quality of census results depends heavily upon techniques used in data collection. The design of a sample enumeration requires basic information about the population being sampled. The appropriate number of units to be included in a sample enumeration cannot be determined without first estimating variances in important population characteristics. Pilot research studies are necessary to obtain this information when it is not available from other sources.

**3.59** Another important reason for establishing a research programme is the need to monitor development of the national food and agricultural statistics programme of which the census is a component. On the one hand, the contribution of the census to this programme depends on relative development of other data sources, such as various agricultural surveys and administrative records. On the other hand, the census should provide a frame for specialized surveys on agricultural holdings essential for planning these surveys.

**3.60** Pilot research studies must be conducted under field operating conditions, otherwise the research results have inadequate bearing on the real situation. Research results must be adequately and properly analyzed and, finally, the best course of action must be implemented to ensure a successful agricultural census. Qualified statisticians with research training and experience are a prerequisite for guaranteeing that these criteria are satisfied.

## CHAPTER 4

### METHODOLOGICAL CONSIDERATIONS

*A programme as large as a census of agriculture has many methodological problems to consider. This chapter, while not exhaustive, reviews the theory on a number of problems that will be encountered.*

*The first subjects covered are objectives and scope, which are primary considerations in the planning process. Other subjects dealt with include coverage, complete or sample enumeration, and the census frame.*

#### Objectives

4.1 Three basic objectives of a census are:

- (a) To provide aggregate totals for fundamental agricultural data to use as benchmarks for inter-censal estimates.
- (b) To provide a frame for other agricultural sample surveys.
- (c) To provide data for small administrative units and detailed cross-classifications of farm structural attributes.

4.2 Since the agricultural census is not a frequent data collection activity, it is natural to associate it with those aspects of agricultural structure which change relatively slowly. Most slow changing aspects relate to organizational structure. Analysis of these aspects also helps to explain, in a general way, causal structure relating to technological changes, economies of scale and supply response. It is necessary to bear in mind that benchmark data from a census may refer to a year affected by drought, disease or other phenomena that makes it atypical.

4.3 The second census objective is to provide a frame for other types of sample surveys on agricultural holdings. Such a frame may be a list of holdings or some other characteristic that helps to identify agricultural holdings.

4.4 The census is the preferred method of providing consistent information for local areas, legal districts or agro-ecological zones. Such local-level estimates are necessary for making policy decisions at local level.

4.5 Census data are also useful in preparing sample designs (such as probability proportionate to size sampling, stratified sampling, etc.) and in obtaining estimates through ratio and regression estimation techniques. Useful stratification criteria are included in the structural aspects of agriculture: sex and age of holder, total area, area by crops, number of livestock, number of trees, integration of holding with enterprises, etc.

4.6 The basic objectives, mentioned above under 4.1, may be too restrictive for some countries. However, countries where statistical systems are not well developed are cautioned, based on prior experience, from expanding the objectives. This caution results from the negative experiences of many developing countries attempting agricultural censuses with wide objectives. Countries with developed statistical systems and sufficient resources may, however, wish to add one or more of the following objectives:

- (a) To obtain benchmark data for improving current crop production estimates.
- (b) To obtain detailed data on livestock characteristics, such as type, age, sex, breed, use, etc.



- (c) To obtain detailed data on characteristics of the agricultural population and on various inputs used for agricultural production, particularly those relevant to the environment such as type and quantity of fertilizers, pesticides, seeds, source of irrigation water, credit, etc.

**4.7** When adding more census objectives, countries should ensure that the basic objectives mentioned in paragraph 4.1 are not adversely affected. To establish their census objectives, countries should carefully evaluate available resources against requirements.

#### **Census scope**

**4.8** The scope of the agricultural census concerns the data to be collected. Consistent with the basic census objectives, the scope is broadly defined as:

- (a) Holding location.
- (b) Legal status of holder.
- (c) Purpose of production.
- (d) Integration of holding with enterprises engaged in other economic activity(ies).
- (e) Basic demographic characteristics of holder and household.
- (f) Inventory of production factors:
  - (i) source of manpower used on the holding (family workers, hired agricultural workers);
  - (ii) number and area of land parcels;
  - (iii) area by land use;
  - (iv) area harvested, by crop;
  - (v) number of cultivated trees by crop;
  - (vi) number of livestock by type;
  - (vii) type of machinery and equipment used;
  - (viii) number of forest trees on the holding;
  - (ix) agricultural buildings.
- (g) Tenure arrangements for production factors:
  - (i) land tenure;
  - (ii) source of machinery and equipment used.
- (h) Other features:
  - (i) shifting cultivation;
  - (ii) use of
    - irrigation;
    - drainage;
    - fertilizers;
    - pesticides;
    - high yielding variety seeds;
  - (iii) fishery or forestry activities if carried out on the holding;
  - (iv) livestock system.

These items are described further in Chapter 5.

**4.9** The above list omits many aspects relevant to agriculture (including production, yields, etc.), which although very important, are not suitable for collection in a multipurpose single enumeration period census. These aspects should, preferably, be covered by sample surveys or other data sources more appropriate to current statistics.

**4.10** If a subject included in the census scope, such as shifting cultivation, is not relevant to a particular country, it should be disregarded.

**4.11** For general guidance in determining the census scope, countries are recommended to critically review their level of statistical development based on the following criteria:

- status of data sources other than the census;
- professional statistical staff available for planning the census and/or surveys;
- field organization, personnel, equipment and budgetary allocations available;
- data processing, storage, printing, and/or retrieval facilities accessible.

**4.12** Countries ranking low in all or most of these criteria are recommended to restrict their census scope to those items presented in Chapter 5 which are marked as "essential" as based on the list in paragraph 4.8. Countries at a medium level of statistical development may wish to include also those structural items for which tabulations of separate administrative units and agro-ecological zones are considered essential. Countries with fully developed statistical systems may wish to further enlarge their census objectives (as mentioned in paragraph 4.6). However, all countries are cautioned against overloading the agricultural census with such an extensive scope that collecting, processing, storing, retrieving and disseminating data becomes too burdensome. Small, cost-efficient sample surveys, based on an adequate frame provided by the census, are the recommended sources for obtaining such additional data. In all cases, if accurate structural data are readily available from other sources such data should be excluded from the census scope.

#### **Statistical unit**

**4.13** The statistical unit for the agricultural census, for which required data items are gathered, is the agricultural holding as defined and explained in paragraph 5.7. It should be noted that the agricultural census will not include communal grazing land, fallow land under shifting cultivation and, generally speaking, all land not operated by agricultural holdings, which may be important categories in many countries.

#### **Coverage**

**4.14** The agricultural census should, in principle, cover agricultural holdings in the entire national territory, including both rural and urban areas. Complete coverage is particularly important for providing a frame for other subsequent agricultural sample surveys. In many countries, a minimum size limit is adopted for holdings included in the census. The rationale for this minimum size limit is that generally there is a large number of small holdings which makes a very small contribution to total agricultural production but whose inclusion in the census greatly increases the workload. Although this argument is acceptable in some countries, it cannot be defended in most countries where very small holdings may contribute substantially to total agricultural production. Small holdings are often a significant part of the agricultural structure; without information on such holdings a complete picture cannot be provided. Countries that exclude small holdings from their agricultural censuses are strongly urged to set the minimum size limit as low as possible and to take steps to collect data through special sample surveys from excluded holdings. No uniform lower limits for production factors such as area, number of trees, livestock, volume or value of output, for example, are suggested.

**4.15** Some countries exclude urban areas and/or semi-desert regions from the agricultural census. Omission of urban areas containing gardens used mainly for vegetable production or intensive animal husbandry activities, such as dairying or poultry farming, may result in loss of valuable information. Similarly, to exclude semi-desert regions may omit important livestock resources - nomadic tribes may keep large numbers of livestock in such regions. As mentioned under census frame", (see paragraph 4.29) a population census, if taken prior to the agricultural census, can identify holders in urban areas and semi-desert regions.

## **Role of Women in Agriculture**

**4.16** It is widely recognized that women's participation in agriculture is of great importance, yet their contribution to agricultural development is in most cases inaccurately reported and often underestimated. The lack of relevant data on women in agriculture has been identified as a major constraint to the integration of women in development planning and to effective project formulation. Therefore, it is recommended that emphasis on the need to collect census statistics, disaggregated by sex, be maintained throughout the process of census planning, questionnaire design, data collection, processing and dissemination. In this connection, countries should pay particular attention to:

- the definition of the minimum size of the agricultural holding in order to include as many small holdings and part-time holdings in urban areas as possible in the enumeration, it being recognized that women's participation in the work and conduct of these holdings is of particular importance;
- the data collection and processing designs to avoid male-bias of agricultural holders, by making sure that the role and contribution of each member of the agricultural holding are taken into full consideration, regardless of sex.

## **Frequency**

**4.17** The Programme for WCA 2000 refers to a national agricultural census taken during the ten-year period, 1996-2005. Countries are recommended to take at least one agricultural census during this period. However, where rapid changes are occurring in their agricultural structure, countries may prefer to conduct censuses at five-year intervals. If the census scope is kept very limited, a five-year interval agricultural census may be feasible and can provide a frame for intervening annual sample surveys that is kept more up-to-date.

## **Time reference**

**4.18** The census reference year is a period of 12 consecutive months, generally encompassing the various time reference dates or periods of data collection on individual census items; it may be a calendar year or an agricultural year. For the census reference year, countries are asked to use a 12-month period covering as much as possible of the calendar year 2000, or, if this is not possible, a year close to 2000, to make international comparisons more meaningful. In general, the time reference for specific items is the agricultural year or the day of enumeration. The reference period for specific items is indicated in Chapter 5.

## **Enumeration period**

**4.19** The actual period in which the census enumeration is taken will be during or immediately after the census reference year; however, the enumeration period should be short. This is essential to avoid omissions or duplications because of variations in information collected, such as changes in livestock numbers created by movements. This also applies when census enumeration is carried out using more than one round, in which case even greater care should be exercised to ensure meaningful tabulation of data obtained from individual holdings. These are additional reasons for limiting the census scope.

## **Complete or sample enumeration**

**4.20** An agricultural census may be conducted through complete enumeration, or sampling or a combination of both. A complete enumeration involves obtaining information from all holdings in the country (see paragraphs 4.14-4.15) whereas sampling involves collecting information from only a predetermined number of holdings. In the past, an agricultural census conducted through sampling was referred to as a sample census of agriculture. In this Programme, the term sample enumeration is preferred, as the word census implies a complete enumeration. Sample enumeration is also consistent with the terminology used by the UN Statistical Office. Complete and sample enumerations are sometimes combined in various ways to conduct an agricultural census: complete

enumeration for a few items and sampling for the remainder; or complete enumeration of certain areas or certain holdings (such as institutional holdings or holdings above a predetermined size) and sampling of other areas or the remaining holdings.

**4.21** In a national statistical programme for food and agriculture it is desirable to have the agricultural census carried out by complete enumeration, if its full objectives are to be met. Only in this way is it possible to obtain statistics for every geographical, agro-ecological or administrative region, irrespective of size. This information is important for a comprehensive understanding of agricultural structure. A sample enumeration cannot provide estimates sufficiently precise at low levels of geographical areas. Complete enumeration also provides a frame on which to base the design of efficient sample surveys, such as an annual production sample survey or a farm management sample survey. The complete enumeration is also useful to identify certain holdings with special features, such as holdings operated by women, or holdings with only rented land, etc. This information is extremely important for rural development programmes oriented towards specific target groups. A sample enumeration will not provide such a complete list of holdings with these special features. Prior information on holdings is not required for a successful complete enumeration, whereas prior information is essential for designing an efficient sample enumeration.

**4.22** On the other hand, complete enumeration is extremely demanding on statistical and other resources including transport and communications systems; management of organizations both centrally and in the field, which need to be staffed with numbers of qualified personnel; certain basic facilities, such as detailed maps, field supplies and data processing equipment; and funds for salaries, per diem, travel and other costs.

**4.23** Sample enumeration is undertaken when these resources are inadequate to allow complete enumeration. A well designed sample enumeration requires more limited resources, may be more manageable and may produce equal or better quality data than a complete census programme at the national or large regional area levels. It should be noted that a successful sample enumeration requires expertise in sampling theory. Frame preparation, stratification, sample selection, developing formulae for estimates and their sampling errors are best accomplished by professionals trained in and with considerable experience of sampling techniques.

**4.24** The census objectives and practical resource limitations must be balanced when choosing between complete or sample enumeration. Countries are urged to undertake research and preparatory studies before deciding on the most appropriate method to use.

### **Census frame**

**4.25** A frame provides the means of identification of the population of interest (i.e. agricultural holdings) and can be either a set of lists or maps identifying the holdings. The frame for an agricultural census should cover all holdings in the country and is needed whether a complete or sample enumeration is to be undertaken.

**4.26** An ideal census frame is a complete list of all holdings. In such a frame, each holding is shown without omissions or duplications and does not include any units other than holdings.

**4.27** A register of holdings (farm registers) which is well established in some countries may be close to an ideal frame. These registers contain regularly updated information which takes account of continuity of holdings over time, as well as their appearance and disappearance. A farm register has a fixed reference number for each holding and basic information on its characteristics is entered periodically. The register is particularly useful when combined with an adequate computer storage information system, thus facilitating data retrieval, tabulation and analysis. If a complete farm register is developed independently of an agricultural census, then the second census objective (providing a frame for specialized sample surveys, as described in paragraph 4.3) can be omitted. Under such conditions, the census scope can be expanded, and can more rationally become a sample enumeration. However, the work volume and difficulties in establishing a farm register with basic information for each holding and its subsequent updating, in particular, is so great that even in statistically developed countries only a few basic items can be maintained in the register.

Accordingly, while the possibilities of building up computerized farm registers and keeping them updated should be considered by all countries with the necessary facilities and regulations, the need for a census will continue.

**4.28** One form of partial farm register may exist in the form of records of state, cooperative and institutional holdings, or list of parties contracting to the state, in countries with centrally planned economies. Almost inevitably there will be holdings which do not appear on such a register and other means of completing the frame will be necessary.

**4.29** Most countries do not have a farm register of any sort and, therefore, need a frame constructed for the census purpose. One such frame can be obtained from a population census, if it is carried out prior to the agricultural census, and if relevant questions for identifying holders are included in the questionnaire. Such a source is useful, even in countries where a farm register is maintained, in order to update or complement the register, particularly in cases where the register does not include holdings of holders having other occupation(s). It is important to note, however, that a frame obtained from a population census may be outdated if the time lag between the population and agricultural censuses is too long. Countries are strongly recommended to coordinate the programme for these censuses. Such coordination is, in fact, necessary within the general framework of a national statistical programme for food and agriculture, where all data collection activities are interrelated not only with respect to scope but also with respect to operations, including timing, personnel, equipment, etc.

**4.30** Other possible frames for an agricultural census include a list of enumeration areas prepared for the population census, a list of localities (villages), aerial photographs and maps. A population census enumeration area has clearly identified limits so that, while all national territory is covered, there is no overlapping. In rural areas, one enumeration area may be a village but larger villages are sometimes divided into several enumeration areas. In some rural areas the population live well dispersed on their holdings and great care is needed to ensure that enumeration areas are well defined.

**4.31** If a complete enumeration is carried out, all holdings in each enumeration area or locality have first to be identified by means of an interview with the local authorities and a visit to each household. Identifying all holdings is tedious. If the census is to be conducted using sample enumeration a sample of enumeration areas or localities is selected as the first-stage sampling units within which the process of identifying the holdings is carried out. For an efficient sampling scheme, prior information relevant to holdings is needed on each enumeration area or locality. In cases where information such as number of holdings, main types of crops grown and number of livestock is not available, one may have to be satisfied with the total population of the enumeration area or locality. The more information that is available the better the sample designs can be.

**4.32** Maps, satellite imagery and aerial photographs can also be used for construction of a frame, particularly for sample surveys. In this case, a sample of well-defined areas is chosen for collecting data. In area sampling, rules are developed to associate data collected on sample areas with holders operating land in those sample areas. If aerial photographs and maps are not readily available, their cost should be compared to the cost of other frames when deciding upon the frame to be used, taking into account that an area sample frame is often believed to be superior to other frames because it requires less frequent up-dating. Satellite imagery has been used increasingly for construction of sample census/survey frames and its use is recommended, particularly for improving sampling design, through better stratification and for improvement of cartography.

## CHAPTER 5

### PROPOSED CENSUS ITEMS

*This chapter contains the proposed census items, and their definitions. The items are arranged in ten sections. Naturally, not all the proposed items are applicable to any one country. Countries must decide which of the proposed items are relevant to their own conditions and data requirements, but should pay particular attention to those main items which are recommended to receive priority. These items are considered essential for national and international purposes and are marked with an asterisk (\*). The WCA 2000 Programme for the first time proposes census items to assist countries in meeting data needs for environmental issues. These items are marked "#".*

#### Introduction

5.1 This chapter contains the proposed census items, the information to be collected and the definitions and explanatory remarks. "Census items" refer to specific information on certain characteristics. They are arranged in ten categories:

<u>Category</u>	<u>Title</u>
01	Identification
02	General Characteristics
03	Demographic and Anthropometric Characteristics
04	Employment
05	Land and Water
06	Crops
07	Livestock
08	Machinery and Equipment
09	Buildings and Other Structures
10	Other Activities

5.2 Following the practice of previous census Programmes, to assist countries in deciding upon priorities among the proposed census items, **an asterisk (\*) is placed before those which are considered essential** for national and international purposes. New to the WCA 2000 are census items to assist countries in meeting environmental issues. **Items with environmental implications are marked "#"**. It should be recognized that many of these items are difficult to collect during the census enumeration and may require special qualified training and instruments and, perhaps, specific surveys.

5.3 Definitions and explanations of concepts are generally the same as those used in earlier Programmes. Most definitions relate exclusively to agricultural statistics. Other general definitions are those recommended by other United Nations agencies to ensure harmony between census results and data collected through other sources.

5.4 A time reference is provided for each item, usually occurring within the census reference year. Countries may wish to alter these time references to suit their individual conditions. With few exceptions, the time references are either the day of enumeration (generally for inventory items) or the agricultural year (generally for continuing activities). The term day of enumeration should be interpreted as the date of the actual interview with the respondent, or a date near it.

## Category 01: Identification

**5.5** Category 01 identifies various reference points of interest in the agricultural census: holding, holder, head of the household of the holder and respondent, in case information is collected from somebody other than the holder. The time reference for the items in Category 01 is the day of enumeration.

**5.6** Proposed items:

- |     |   |
|-----|---|
| 011 | HOLDING<br>* Address  |
| 012 | HOLDER<br>* Name<br>Address, if different from holding                        |
| 013 | RESPONDENT FOR HOLDING<br>Whether respondent is holder<br>Name, if not holder |

**(Note: \* See "essential items" paragraph 5.2 )**

**5.7** Holding - The holding definition is basically the same as used in previous Programmes. An agricultural holding is an economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural production purposes, without regard to title, legal form, or size. Single management may be exercised by an individual or household, jointly by two or more individuals or households, by a clan or tribe, or by a juridical person such as a corporation, cooperative or government agency. The holding's land may consist of one or more parcels, located in one or more separate areas or in one or more territorial or administrative divisions, providing the parcels share the same production means utilized by the holding, such as labour, farm buildings, machinery or draught animals. The requirement of sharing the same production means utilized by the holding is necessary if the various parcels are to be considered as components of one economic unit. Definition of classes of agricultural activities and explanatory notes are given in Appendix 2 ( UN 1990, pp. 71-72).

**5.8** Economic units engaged **solely** in the following economic activities are not considered agricultural holdings and are therefore excluded from the census:

- hunting, trapping and game propagation
- forestry and logging
- fishing
- agricultural services

**5.9** The following additional points relate to the identification of a holding:

- (a) Holdings may have no significant land area, e.g. poultry hatcheries or holdings keeping livestock for which land is not an indispensable input for production.
- (b) Holdings may be operated by persons who do not have any rights to agricultural use of the land except for the products of the trees grown on it (tree holdings).
- (c) Various economic agricultural production units under the same ownership, or under the same general management, may be considered separate holdings if they are operated by different persons.
- (d) There may be more than one holding in a household.
- (e) There may be holdings operated jointly by two or more individuals.
- (f) If a member of a cooperative, religious organization, government agency, clan or tribe, is assigned a separate unit for agricultural production that is operated under the member's management, and over which the member has general, technical and economic responsibility, then this unit represents a holding.

- (g) There may be holdings operated by holders having other occupation(s) in addition to being a holder.
- (h) Open rangeland (such as land open to communal grazing) is not normally considered a holding. A specified area delimited by fencing, or any other form of boundary demarcation may be an exception if its use is supervised. Such land qualifies as a communal grazing land holding and may be included as a special category. Otherwise common grazing land should not be considered a holding. If a decision is made to distinguish communal grazing land from open rangeland the criteria used should be indicated. Data collected for communal grazing land holdings should include only the following items: location and holding area; holder's legal status (government, tribe and/or clan, etc.); and, if possible, the number of livestock holders having access to this holding. This information should be tabulated separately from the tabulations regarding other holdings.

**5.10** Holding address - The holding location should be given in detail on the census questionnaire. If the holding is located in a village or hamlet, the village or hamlet name and administrative area should be recorded. This is essential for tabulating results by administrative units or agro-ecological zones. It will also facilitate enumeration control, subsequent verification, follow-up sample surveys, etc. If the holding comprises two or more parcels, special care is required in describing the holding location. Generally, the location of the parcel containing the farm buildings or other farm structures and the main machinery or equipment may be designated as the holding location. In many cases, the holder's residence may be suitable as the holding location description. If resources are available, it is becoming most important to geo-reference holdings with use of Global Positioning Systems (GPS); it is advisable to begin to move in this direction to enable further uses of census data, mainly through Geographic Information Systems (GIS).

**5.11** Holder - The holder is a civil or juridical person who makes major decisions regarding resource use and exercises management control over the agricultural holding operation. The holder has technical and economic responsibility for the holding and may undertake all responsibilities directly, or delegate responsibilities related to day-to-day work management to a hired manager. See legal status of holder (paragraph 5.16) and hired manager (paragraph 5.22 for further explanation.)

**5.12** Enumerators must be trained to be aware that the holder is not always the legal owner of the land nor, necessarily, the oldest male in a household. The person making the major decisions regarding resource use - deciding what and when to plant, what animals to breed, when to cultivate crops and when to harvest crop or livestock items - may be a junior or female member of the household. Identifying the holder based on custom for the area, administrative records, or age and sex may distort the final results and lead to incorrect analysis, particularly with regard to holders by sex and age.

**5.13** Respondent - The respondent is the person from whom data are collected about the statistical unit.

## **Category 02: General Characteristics**

**5.14** Category 02 covers the legal status of the holder, the concept of a hired manager, and integration of the holding with other economic units. The time reference for items on economic activities and purpose of production is the agricultural year. For other items, the time reference is the day of enumeration.



## 5.15 Proposed items:

- 021     HOLDER  
 \* Legal status of holder  
     Private  
       An individual  
       A household  
       Two or more individuals of different households or two or more households  
     Corporation  
     Cooperative  
     Other (specify)  
     Government
- 022     HIRED MANAGER  
 Whether there is a hired manager  
 Name  
 Address, if different from holding  
 Economic status of hired manager (wage, salary or shares financial returns from holding)
- 023     # ECONOMIC ACTIVITIES OF AN ENTERPRISE  
 Whether holding is part of enterprise engaged also in other economic activities  
 Other economic activities of enterprise  
     Agricultural services  
     Hunting, trapping and game propagation  
     Forestry and logging  
     Fishing  
     Manufacturing  
     Other (specify)
- 024     \* PURPOSE OF PRODUCTION  
 Producing mainly for home consumption  
 Producing mainly for sale

**(Note: \* and # See "essential items" paragraph 5.2)**

**5.16**    Legal status of holder - The term legal status is not necessarily confined to the holder's legal characteristics; it concerns broader aspects of identifying specific types of holdings. Two types are first differentiated: private and government; then a further disaggregation of private holders is provided. In most cases, the private holder is an individual, but there may be more than one holder in a given household, each operating a separate holding. If the agricultural operations carried out and commodities produced by different household members are pooled, it is more practical to treat them as one holding. This condition prevails in some regions as a kind of traditional agriculture. In extended households and composite households (defined in paragraphs 5.28-5.31) it is more convenient to identify several holders. The pooling of various holdings operated by members of the same household, or splitting a household into separate households (each corresponding to one holding), avoids double counting of household members for data collected on the holder's household (see paragraph 5.26).

**5.17**    Where two or more members of the same household jointly operate the same holding, the holder is considered to be the household. It is possible that a household member who jointly operates such a holding may also be the sole holder of another holding operated independently of other household members.

**5.18**    When two or more individuals of different households jointly operate a holding, they should each be recorded as a joint holder; separate data should be collected for the household of each joint holder.

**5.19** Juridical persons, such as a corporation or cooperative, are entities separate from the real persons who form them and they should be defined within the context of national laws and customs. In most countries, joint stock companies constitute typical examples of corporations. Cooperatives include several kinds of organizations in which the principles of individual, joint ownership, or leasehold are combined to various degrees.

**5.20** Private holders not specified in any of the above classes should be identified separately. Examples are tribes, clans, private schools and religious institutions other than collective monastic orders or their equivalent.

**5.21** Government holdings are operated by officers of a central or local government directly or through a special body.

**5.22** Hired manager - A hired manager is a civil or juridical person who takes technical and administrative responsibility to manage a holding on a holder's behalf. Responsibilities are limited to making day-to-day decisions to operate the holding, including managing and supervising hired labour. Wages may be paid in cash and/or kind. A hired manager who shares economic and financial responsibilities in addition to managing the holding should be considered a holder or a joint holder.

**5.23** Enterprise - Enterprise is the legal entity or family of legal entities owning or controlling a number of establishments and is defined as: "An institutional unit or the smallest combination of institutional units that encloses and directly or indirectly controls all necessary functions to carry out its production activities" (UN 1990, p. 20).

**5.24** Economic activities of an enterprise - An enterprise may be engaged in two or more economic activities of which agriculture is only one.

**5.25** Purpose of production - Enumerators should elicit whether the purpose of production is mainly for sale or home consumption, and record the response. If the respondent needs help in providing a response, "mainly" means more than half of the agricultural production of the holding.

### **Category 03: Demographic Characteristics**

**5.26** Category 03 describes the holder and holder's household members. Items are proposed for holdings operated by: an individual; a household composed of two or more persons; and two or more individuals of different households or two or more households. Where holdings are operated by two or more individuals of different households or by two or more households, data on the total number of household members and age and sex of household members should be recorded separately for each of the joint holders. For tabulations by sex and age of the holder, one of the joint holders must be identified as the senior holder. Duplication should be avoided when collecting data from joint holders, as some may also operate another holding separately or jointly with others. (See paragraphs 5.16-5.18). The time reference for items in Category 03 is the day of enumeration.

**5.27** Proposed items:

<u>031</u>	<u>HOUSEHOLD</u> Number of household members
<u>032</u>	<u>HOUSEHOLD MEMBERS</u> Name * Age * Sex Marital status Education

(Note: \* See "essential items" paragraph 5.2 )

**5.28** Household - The household concept is one of the basic elements of a national statistics system. According to the United Nations:

"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 or her own food or other essentials for living without combining with any other person to form part of a multiperson household, or (b) a multiperson household, that is, a group of two or more persons living together who make common provision for food or other essentials for 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, boarding houses or hotels or as administrative personnel in institutions, or they may be homeless. Households consisting of extended families that make common provision for food or of potentially separate households with a common head, resulting from polygamous unions, or households with vacation or other second homes may occupy more than one housing unit. Homeless households are defined as those households without a shelter that would fall within the scope of living quarters." (UN 1980, p.50)

**5.29** Various household types must be explained, particularly the extended household, due to the possibility of more than one holding per household. The United Nations recommends a household classification based on the family nucleus. The family refers to "those members of the household who are related, to a specified degree, through blood, adoption or marriage". (UN 1980, p.72) A household may contain more than one family. A family nucleus consists of one of the following types (each of which must consist of persons living in the same household): (a) a married couple without children; (b) a married couple with one or more never-married children; (c) a father with one or more never-married children; or (d) a mother with one or more never-married children.

**5.30** The following household types are identified:

- (a) One-person household.
- (b) Nuclear household, defined as a household consisting entirely of a single family nucleus.
- (c) Extended household, defined as a household consisting of either:
  - (i) a single family nucleus and other persons related to the nucleus;
  - (ii) two or more family nuclei related to each other;
  - (iii) two or more family nuclei related to each other, plus other persons related to at least one of the nuclei; or
  - (iv) two or more persons related to each other but none of whom comprises a family nucleus.
- (d) Composite household, defined as a household consisting of either:
  - (i) a single family nucleus plus other persons, some of whom are related to the nucleus and some of whom are not;
  - (ii) a single family nucleus plus other persons, none of whom is related to the nucleus;
  - (iii) two or more family nuclei related to each other plus other persons, some of whom are related to at least one of the nuclei;
  - (iv) two or more family nuclei related to each other plus other persons, none of whom is related to any of the nuclei;
  - (v) two or more family nuclei not related to each other, with or without any other persons;
  - (vi) two or more persons related to each other but none of whom comprises a family nucleus, plus other unrelated persons; or,
  - (vii) non-related persons only. (UN 1980, pp. 73-74)

**5.31** In rural areas, particularly in developing countries, a one-to-one correspondence between a household and a holding is quite common. Thus households serve to identify holdings. This is the

case particularly in developing countries. The number of households whose members operate separate holdings, or the number of holdings operated by two or more persons belonging to different households is few but nevertheless exists. When considering the relationship between a household and a holding it is important to remember that the former is a complex socio-economic unit, while the latter is a simple economic unit. As such, when studying the holding related to a rural household, whose head is the holder with some household members participating in the work of the holding, it is recommended to consider:

- (a) The holding as the economic unit engaged in agricultural production.
- (b) Household members participating in the work of the holding as members of the labour force used by the holding.
- (c) Members of the household not participating in the work of the holding as not directly related to the holding.

**5.32** Head of household - The head of household is the person (male or female) in the household acknowledged as head by the other members. The head has primary authority and responsibility for household affairs. However, in cases where such authority and responsibility are not vested in one person, special rules may be needed to identify the head of household (UN 1980, p.70).

**5.33** Age - Age is the time interval between birth date and census date, expressed in completed calendar years.

**5.34** Education - Education can be classified as follows:

- illiterate
- literate with no regular schooling
- elementary school
- secondary school
- high school
- university
- agricultural vocational training
- other vocational training

**5.35** Marital status - Marital status can be classified as follows:

- single (never married)
- married
- in consensual union
- in polygamous union
- separated
- divorced
- widowed

#### **Category 04: Employment**

**5.36** Category 04 caters on a limited scale for employment data pertaining to members of the holder's household and other agricultural workers on the holding. Items are proposed for holdings operated by an individual, a household composed of two or more persons, two or more individuals of different households or two or more households. Other holdings are excluded. Items concerning the holder's household identify members who are economically active and a broad indication of their contribution to the work on the holding. Items on holder's occupation(s) identify holders having other occupation(s) in addition to being a holder. Data on employment of agricultural workers, other than the holder's household, provide the means for classifying holdings by hired agricultural workers.

5.37 Proposed items:

041 FOR EACH HOUSEHOLD MEMBER

Whether economically active or not

- \* Main occupation
  - \* Whether engaged in more than one occupation
- Whether any work done on holding during the year

Whether permanent or occasional agricultural worker on holding

042 AGRICULTURAL WORKERS OTHER THAN MEMBERS OF HOLDER'S HOUSEHOLD

Whether permanent agricultural workers employed during year

Whether occasional agricultural workers employed during year

Number of permanent agricultural workers - male (skilled or not)

Number of permanent agricultural workers - female (skilled or not)

(Note: \* See "essential items" paragraph 5.2 )

5.38 The time reference for Category 04 items, except those relating to number of permanent workers, is the agricultural year. A long reference period is necessary as work on a holding is seasonal with uneven demands within the season. There are periods when the work is intensive and others when it is almost non-existent depending on weather conditions; farmers may wait for rain or other favourable conditions. The census emphasis is on the source of labour inputs rather than volume of employment. The time reference for the number of permanent agricultural workers by sex is the day of enumeration.

5.39 Economically active/Not economically active - An economically active person is a person of either sex above a specified age working at a job or seeking work for pay or profit. These specifications for an economically active person are further elaborated in the following paragraphs (UN 1980, add. 1, Page 9).

5.40 The minimum age limit for economically active persons should be set in accordance with conditions in each country, but should not be set higher than 15 years. A lower minimum age limit will normally be appropriate in developing countries where it is customary for younger children to participate in agricultural work. To facilitate international statistical comparisons, tabulations should distinguish between persons under 15 years and those above. A separate tabulation for persons under ten years of age is recommended where a country's minimum age limit is below ten years.

5.41 Economically active population comprises persons employed and unemployed during the reference period. Employed comprises all persons, including unpaid family workers, who worked during the reference period, or who had a job in which they previously worked, but from which they were temporarily absent because of illness or injury, industrial disputes, vacation or other leave, or temporary interruption of work for such reasons as bad weather, mechanical breakdown or production requirements.

5.42 Unemployed comprises all persons not working during the reference period, but seeking work for pay or profit, including those who have never worked before. Persons not seeking work during the reference period because of temporary illness, previous arrangements to start a new job subsequent to the reference period, or on temporary or indefinite lay-off without pay, are also included. It is consistent with international standards to include as unemployed persons available for work but not actively seeking work because they believe no jobs are available (UN 1980, add. 1, page 13).

5.43 Unpaid family workers who constitute a subset of employed persons require special mention. The United Nations defines an unpaid family worker as "usually a person who works, without pay, in an economic enterprise operated by a related person living in the same household. Where it is customary for young persons, in particular, to work without pay in an economic enterprise operated by a related person who does not live in the same household, the requirement of living in the same

household may be eliminated" (UN 1980, Add.1, p. 19). Strict application of the minimum working requirement (at least one third of the normal working hours) for unpaid family workers in agriculture is not recommended; otherwise a large number of people, including many female workers, dividing their working time between study or housework and work on the holding, may be excluded from the economically active population. Each country should determine the minimum requirement for the amount of time worked on the holding by a member of the holder's household during the reference period, to determine whether the member should be considered to have worked on the holding or not. Members who worked on the holding are part of the economically active population.

**5.44** To classify members of the holder's household into economically active and not economically active, the general principle is that participation in an economic activity should always take precedence over participation in a non-economic activity. Hence, employed and unemployed persons should be excluded from the not economically active population. For example, students or home makers are classified as economically active if they participate in an economic activity during the reference period. Similarly, persons receiving pensions consequent to retirement from one job but who are, at the same time, working at another job, should be considered economically active.

**5.45** The population not economically active comprises all persons whose status during the reference period was neither employed nor unemployed, as previously defined. It comprises the following functional categories:

- (a) Home makers - Persons of either sex, not economically active, who are engaged in household duties in their own home, for example, housewives and other relatives responsible for the care of the home and children (domestic employees working for pay, however, are classified as economically active).
- (b) Students - Persons of either sex, not economically active, who are attending regularly an educational institution, public or private, for systematic instruction at any level of education.
- (c) Income recipients - Persons of either sex, not economically active, who receive income from property or investments, interest, rent, royalties or pensions from former activities.
- (d) Others - Persons of either sex, not economically active, who are receiving public aid or private support, and all other persons not falling into any of the above categories, such as children not attending school (UN 1980 Add. 1, page 14).

**5.46** Occupation - Occupation refers to the kind of work performed during the reference period by the person employed/self-employed (or the kind of work done previously, if unemployed), irrespective of the industry or employment status. For persons reporting more than one occupation, main occupation is determined as either the occupation on which most time was spent during the period, or the occupation which was most remunerative during the period. Occupation normally applies to economically active persons only.

**5.47** Occupations are classified in the International Standard Classification of Occupations (ISCO-88), issued by the International Labour Office (ILO 1990), into the following Major Groups:

- 1. Legislators, senior officials and managers
- 2. Professionals
- 3. Technicians and associate professionals
- 4. Clerks
- 5. Service workers and shop and market sales workers
- 6. Skilled agricultural and fishery workers
- 7. Craft and related trade workers
- 8. Plant and machinery operators and assemblers
- 9. Elementary occupations
- 10. Armed forces

**5.48** Work in agricultural activities is included in major groups 1, 2, 3, 6 and 9 but most persons in rural areas report occupations belonging to groups 6 and 9. The Major Groups are divided into Minor Groups described in detail in the Standard Classification of Occupation (ILO 1990). When

assigning detailed occupation coding for occupations according to local conditions, countries are urged to use the Minor Groups (or subsets of them) in order to provide internationally comparable classifications on agricultural work.

**5.49** Group 6, skilled agricultural workers, includes workers whose "tasks require the knowledge and experience necessary to produce farm products" (ILO 1990, p. 6). These may be further subdivided into minor groups relating to their type of activities.

**5.50** Group 9, elementary occupations, covers workers whose "occupations require the limited knowledge and experience necessary to perform mostly simple and routine tasks, involving the use of hand-held tools and in some cases considerable physical effort and with few exceptions only limited personal initiative or judgement. Tasks include: digging and shovelling; loading and unloading; raking, pitching and stocking hay; watering and weeding; picking fruit and other crops; feeding, watering and cleaning animals; etc." (ILO 1990, p. 7 and 258).

**5.51** Permanent and occasional agricultural workers - A permanent agricultural worker is a person whose services are utilized regularly and continuously during the agricultural year for agricultural work on the holding. In some countries the total number of days worked during the agricultural year (normally six months or more) distinguishes a permanent from an occasional worker. However, a permanent worker may actually work less than six months during the agricultural year, especially in crop production in countries with one crop season. Countries should determine the minimum number of working days or months in accordance with their particular agricultural and other relevant conditions. Permanent agricultural workers on the holding may engage in other work, especially during periods when no significant agricultural work is undertaken. An occasional worker is a person working one or more times during the agricultural year who is not expected to work regularly or continuously on the holding.

#### **Category 05: Land and Water**

**5.52** Category 05 covers the basic indicators relating to the land and water resources of the holding. Items are presented in two subdivisions: 051 includes holding level items; whereas 052 items relate to individual parcels. Some countries may prefer to collect all data at the holding level. This approach results in a simplified questionnaire, but places an additional burden on enumerators who may themselves have to aggregate the figures for each parcel.

**5.53** Proposed items:

- |             |   |
|-------------|---|
| <u>051</u>  | <u>FOR ENTIRE HOLDING</u>               |
| <u>0511</u> | <u>NUMBER OF PARCELS AND TOTAL AREA</u> |
|             | * Number of parcels                     |
|             | * Total area                            |
| <u>0512</u> | <u>RENTAL OF LAND</u>                   |
|             | Whether land was rented to others       |
|             | Area of land rented to others           |
| <u>052</u>  | <u>FOR EACH PARCEL</u>                  |
| <u>0521</u> | <u>LOCATION AND AREA</u>                |
|             | Location                                |
|             | * Total area                            |

- 0522 \* LAND TENURE  
 Owned or held in ownerlike possession  
 Rented from others (total)  
   For an agreed amount of money and/or produce  
   For a share of produce  
   In exchange for services  
   Under other rental arrangements  
 Operated on a squatter basis  
 Operated under tribal or traditional communal forms of tenure  
 Operated under other tenure forms

- 0523 \* LAND USE

PRODUCTIVE LAND  
AGRICULTURAL LAND  
CULTIVATED LAND  
CROPLAND

ARABLE LAND

- Land under temporary crops - in open air  
 Land under temporary meadows  
 Land temporarily fallow  
 All other arable land

LAND UNDER PROTECTIVE COVER

- Land under protective cover - temporary crops  
 Land under protective cover - permanent crops

LAND UNDER PERMANENT CROPS - IN OPEN AIR

LAND UNDER PERMANENT MEADOWS AND PASTURES

- Cultivated  
 Naturally grown

WOODLAND OR FOREST

ALL OTHER LAND

- Unused and undeveloped potentially productive land  
 Land in holding n.e.s.<sup>1</sup>

- 0524 IRRIGATION AND DRAINAGE  
 \* Irrigated at some time during the year  
 Whether drainage facilities available  
 # Area irrigated  
 # Area affected by salty soil or high water table  
 Area with irrigation potential

- 0525 SHIFTING CULTIVATION  
 \* Whether shifting cultivation practised  
 Year current parcel cleared for cultivation.

<sup>1</sup> n.e.s. is used throughout the text for "not elsewhere specified".



**0526 # SOIL**

Soil type (sand, loam, light, clay, heavy clay)

Soil colour (black, grey, yellow)

Soil depth ( &lt; 30 cm, 30-90 cm, &gt; 90 cm)

Soil salinity (nil, moderate, high)

Surface drainage (good, moderate, high)

Rate of percolation (high, moderate, low)

Soil degradation (light, moderate, strong, extreme)

Relative area (of the holding) of degradation (&lt; 6%, 6-10%, 11%-25%, 26-30%, &gt; 30%)

**(Note: \* and # See "essential items" paragraph 5.2)**

**5.54** The time reference for all items in category 05, except irrigation during the year, in general refers to a specific date. The date may be the day of enumeration or another day close to it. If there are two or more crop seasons, the information should refer to a specific date during the major crop season of the census reference year. A departure from reliance on a specific date is sometimes necessary because land use should be classified according to priority of use. For example if a holder harvested land under temporary crops and this land is fallow on enumeration day, the area should be counted as land under temporary crops, not as land temporarily fallow.

**5.55** Parcel - The term parcel, as used here, should not be confused with the same term in cadastral work. A holding parcel is any piece of land entirely surrounded by other land, water, road, forest, etc. not forming part of the holding. A parcel may consist of one or more fields adjacent to each other. A field is a piece of land in a parcel separated from the rest of the parcel by easily recognizable demarcation lines, such as paths, cadastral boundaries and/or hedges. A field may consist of one or more plots. A plot is a part or whole of a field on which a specific crop or crop mixture is cultivated.

**5.56** Parcel location - For ease of identification, the parcel location should be described in accordance with the most common practice in each country. Using a Global Positioning System (GPS) for locating the holding (see 5.10) may be also helpful for further uses and particularly when returning to the field for quality control or checking on enumerators.

**5.57** Total area of holding - This is obtained by summing the areas of each parcel making up the holding. Land owned by the holder but rented to others should not be included in the total area of the holding. The farmyard and land occupied by farm buildings should be included. The land area of the holder's house is also included in total area of holding if the house is located on the holding (and not, for example, in a residential area of a nearby village or town), and is used solely for residential purposes. The total area of a holding based on shifting cultivation (see paragraph 5.85 for definition of shifting cultivation) should include the area under crops during the reference period and the area prepared for cultivation but not sown or planted at the time of enumeration. Land abandoned prior to the reference period should be excluded. Holders having access to communal grazing land should not include their estimated share of such land in the total area of holding. The total area of holding should be equal to the total land area under various classes of use.

**5.58** Gross and net area - Gross area refers to all land area under the respective land-use classes, including uncultivated patches, bunds, footpaths, ditches, headlands, shoulders, and shelterbelts. Net area, if required, can be obtained by deducting these areas from the gross area.

**5.59** Land Tenure - Land tenure refers to arrangements or rights under which the holder holds or uses holding land. Land rented out is not considered to be a part of the holding. A holding may be operated under one or more tenure forms, with each parcel normally operated under one tenure form. All data regarding land tenure should be collected for the same time reference.

**5.60** Area owned - Area owned is the holding area for which the holder possesses title of ownership and has the right to determine the nature and extent of its use. It does not include area owned but rented to others.

**5.61 Area held in ownerlike possession** - Comprises the land area held under conditions which enable it to be operated as if owned by the holder, without possessing an ownership title. It does not include area held in ownerlike possession but rented to others. Some common types of ownerlike possession include:

- (a) Land operated under perpetual lease or hereditary tenure and under a long-term lease, usually ranging from 30-99 years, with a nominal rent or none.
- (b) Land operated peacefully and without interruption for a time period such as 30 years by the holder without legal ownership title or long-term lease or payment of rent.
- (c) The system under which a rent-free plot of tribal, or other communal land is received and retained as long as it is kept under cultivation by the recipient's personal and household labour, but which cannot be sold or mortgaged.

**5.62 Area rented from others** - The total area of all holding parcels rented or leased by the holder from other persons, usually for a limited time period. Rental arrangements may take different forms:

- (a) Land rented for an agreed sum of money and/or produce with land administration, management and operation generally being the holder's responsibility, i.e. the holder is the lessee.
- (b) Land rented for a share of the produce (in exceptional cases an equivalent in money), the share amount depending on local conditions and type of agriculture involved with technical responsibility for management lying exclusively with the holder or shared, to a limited degree, with the landlord if the latter contributes tools, fertilizers, or other aids and with holder and landlord sharing the economic risks.
- (c) Land rented in exchange for services - the usufruct being granted to the holder instead of wages. Two examples are: agricultural labourer operates a piece of land in return for which he must work, unpaid, for the landlord for a certain number of days; and holder is granted land use in partial payment for services to government, religious organization or other institution.
- (d) Land operated under other rental arrangements such as areas of usufructuary mortgages and land operated gratuitously (namely, granted rent free).

**5.63 Area operated on a squatter basis** - Total land area operated by holder without ownership title and without paying rent while retaining total usufruct. Land occupied by squatters may be private or public property occupied without owner's consent, sometimes tolerated, particularly in public domain.

**5.64 Area operated under tribal or traditional tenure forms** - Land in this category is held with joint or communal use based on traditional or tribal conditions. This tenure form may be important in countries where land is held on a tribal, village, kindred, or clan basis with certain individual rights held by virtue of membership in the social unit. Land title, often vested in the tribal chief, is communal in character.

**5.65 Area operated under other forms of tenure** - Tenure forms other than those previously described may be common or limited in some countries. Examples are: land operated under transitory tenure forms, such as trusteeship (operated by trustee); land received by members of collective holdings for individual use; or land under inheritance proceedings.

**5.66 Land use** - Land use provides a classification of the holding according to the activity which is directly related to the land, makes use of its resources or has an impact upon it.

**5.67 Arable land** - This includes all land used in most years for growing temporary crops, which would normally be so used in the census year but which is lying fallow or has not been sown due to unforeseen circumstances. Arable land does not include land under permanent crops or land under protective cover. Arable land is not meant to indicate land that is potentially cultivable but is not normally cultivated.

**5.68 Land under temporary crops - in open air** - This includes all land in the open air used for crops with a less than one-year growing cycle, which must be newly sown or planted for further

production after the harvest. Some crops that remain in a field more than one year may also be considered as temporary crops: asparagus, strawberries, pineapples, bananas, and sugar cane, for example, may be grown as annual crops in some areas. Such crops should be classified either as temporary or permanent crops according to the custom in the country. Vegetables, flowers, bulbs, and kitchen and market gardens, should also be included in this category. Alternatively, countries may wish to establish the class land under specialized cultivation for this land use type.

**5.69** Land under temporary meadows and pastures - This includes land temporarily cultivated with herbaceous forage crops for mowing or pasture. A period of less than five years should be considered as temporary to avoid practical difficulties when differentiating between temporary and permanent meadows. If country practice differs from this the country definition should be clearly indicated in census reports.

**5.70** Land temporarily fallow - This is land at prolonged rest before recultivation. Land remaining fallow for too long may acquire characteristics requiring it to be reclassified, such as permanent meadows and pastures (if used for grazing), or woodland or forest (if overgrown with trees that could be used for timber, firewood, etc.), or all other land (if it becomes wasteland). A maximum idle period should be specified - probably less than five years. Land is not considered temporarily fallow unless it has been, or is intended to be, kept at rest for at least one agricultural year. Land temporarily fallow should be distinguished from land abandoned by shifting cultivation; the former is part of the holding whereas the latter is not.

**5.71** If census data are collected before sowing or planting has been completed, the area lying fallow at that time that will be put under crops soon afterwards should be classified by the crops to be sown or planted, and not as fallow land.

**5.72** Fallow land temporarily used for grazing should be classified as fallow if the land is normally used for cultivating temporary crops.

**5.73** All other arable land - This includes all rotation land not put to the uses mentioned above during the reference year, such as arable land temporarily damaged by floods, land prepared for cultivation but not sown due to unforeseen circumstances, etc.

**5.74** Land under protective cover - This is land under structures with protective roof of glass, plastic or other material. Such land may be used for both temporary and permanent crops.

**5.75** Land under permanent crops - in open air - This includes land cultivated with long-term crops which do not have to be replanted for several years; land under trees and shrubs producing flowers, such as roses and jasmine; and nurseries (except those for forest trees, which should be classified under woodland or forest). A nursery is a piece of land where young plants are cultivated for transplanting and/or sale. Permanent meadows and pastures are excluded from land under permanent crops. Care should be exercised when reporting land under permanent crops in cases of associated crops.

**5.76** Land under permanent meadows and pastures - This includes land used permanently (for five years or more) to grow herbaceous forage crops, through cultivation or naturally (wild prairie or grazing land). Permanent meadows and pastures on which trees and shrubs are grown should be recorded under this heading only if the growing of forage crops is the most important use of the area.

**5.77** Cultivated permanent meadow and pasture areas should be recorded separately from naturally grown permanent meadows and pasture areas (see also land under temporary meadows and pastures, paragraph 5.69).

**5.78** Woodland or forest - This includes woodlot or timber tracts, natural or planted, constituting part of the holding which have or will have value as wood, timber, other forest products or for protection. Forest tree nurseries should be included in this category. Rows, belts and small clumps of trees, bamboo and other woody vegetation should be included in woodland and forest.

**5.79** All other land - This includes all other land on the holding, not elsewhere specified, whether or not potentially productive. It covers two land classes: unused and undeveloped land potentially productive for agriculture or forestry, but not yet developed; and land on the holding not elsewhere specified.

**5.80** Unused and undeveloped potentially productive land - This includes uncultivated land, comprising part of the holding but not included under the preceding headings, producing some kind of utilizable vegetable product, such as reeds or rushes for matting and bedding for livestock, wild berries, plants and fruit, or land which could be brought into crop production with little more effort in addition to that required in common cultivation practices.

**5.81** Land in the holding not elsewhere specified - This includes land occupied by buildings, parks and ornamental gardens, roads or lanes, open spaces needed for storing equipment and products, wasteland, land under water, and any other land not reported under previous classes.

**5.82** Other classifications of land use - There are additional classifications of land use not listed above. Countries that prefer to use these classifications or others should indicate the components to provide internationally comparable statistics. Some of the most common of these classifications are cropland, agricultural land, and cultivated land. Often these classifications will fit among the classifications recommended above. As an example:

Cropland is often defined as including all arable land (paragraph 5.67) plus land under permanent crops (paragraph 5.75). Cultivated land is used in some countries to include arable land plus the cultivated part of land under permanent meadows and pastures (paragraph 5.77). Agricultural land generally includes area in cropland plus the land under permanent meadows and pastures (paragraph 5.76). Productive land is the result of adding woodland or forest (paragraph 5.78) to agricultural land.

**5.83** Irrigation - Irrigation refers to purposely providing land with water, other than rain, for improving pastures or crop production. Uncontrolled land flooding by overflowing of rivers or streams is not considered irrigation. When rainwater or uncontrolled overflow from rivers and streams is collected and later used on the land for crop or pasture production, this is considered irrigation.

**5.84** Drainage - Drainage is the removal of excess water from land surface and/or the upper soil layer to make nonproductive wet land productive and wet land more productive.

**5.85** Shifting cultivation - Shifting cultivation is a land utilization method whereby a particular piece of land is cultivated for some years and then abandoned for a period sufficient for it to restore its fertility by natural vegetative growth before being recultivated. The distinguishing characteristic of shifting cultivation is that neither organic fertilizers nor manure are used to retain soil fertility. As a result cultivated land productivity steadily decreases and it becomes economically preferable to open up a new piece of land and abandon the existing one. Abandoned land usually takes a long time to regain fertility by natural processes. Shifting cultivation is a traditional, ecologically integrated method of land utilization, suitable for areas with low density of population. With increasing pressure on land, in some areas, holders move their dwellings when they shift to new land in order to be close to their holdings.

**5.86** Soil characteristics - The soil characteristics, along with other factors such as climate, rainfall, and water availability, form an important basis for agricultural locational planning. Four basic characteristics which can be easily observed need to be recorded.

- (a) Soil type - indicating texture of the soil. Three important factors which determine the soil texture are sand, silt and clay. Depending on their quantum in the soil, the soil can be divided into five or more (or less) groups, viz. sand, loam, silt, clay and clay-loam.
- (b) Soil depth - the available depth of the soil above a rock or hard horizon is known as soil depth which provides for the proper growth of the plant. The soil depth may be classified as shallow land and deep land if the more precise classification presents difficulties.

- (c) Soil salinity - soils containing sufficient soluble salts to interfere with the germination and growth of most crops are called saline soils. Such soils are generally recognized by the presence of white encrustation on its surface, especially during winter. Moderate salinity indicates soil with moderately rich parent materials and need more fertilizers for proper growth of the crop whereas in case of high salinity, in addition to fertilizers, other nutrients are also required.
- (d) Soil colour needs no explanation.

**5.87** Soil degradation - Soil degradation can be described as a process by which one or more of the potential ecological functions of the soil are harmed. These functions relate to biomass production (nutrient, air and water supply, root support for plants) to filtering, buffering, storage and transformation (e.g. water, nutrients, pollutants), and to biological habitats and gene reserves. Soil degradation is defined as a process which lowers the current and/or future capacity of the soils to produce.

**5.88** Two categories of soil degradation processes are recognized. The first group relates to displacement of soil material (i.e. soil erosion by water forces or by wind forces) and the other deals with soil deterioration *in-situ*, i.e. chemical (loss of nutrients and/or organic matters, salination, acidification, pollution) and physical (compaction, crusting and sealing, waterlogging, subsidence of organic soils) degradation. Soil degradation should be classified into four classes:

- (a) Light - the potential of land is slightly reduced and complete restoration of potential is possible with modification of the farm management system.
- (b) Moderate - the productivity of the land is considerably reduced, and substantial improvements are needed to restore the potential for the biotic functions have been partly destroyed.
- (c) Strong - the land can no longer be recovered at the farm level for the major biotic functions of the land have been completely destroyed.
- (d) Extreme - the land is irrecoverable and incapable of restoration.

### Category 06 - Crops

**5.89** Category 06 covers basic features of crop cultivation on the holding. These data include area under all temporary crops and area and number of trees for all permanent crops. The minimum data requested on fertilizers, pesticides and improved seed refer only to whether these were used on the holding for any crop. Data on crop production, quantity of fertilizers and pesticides used, area treated crop by crop, are normally covered by specialized sample surveys.

**5.90** Proposed items:

061      TEMPORARY CROPS

- \* Name of crops grown
- \* Area harvested

062      PERMANENT CROPS

- Name of crops grown
- Number of scattered trees
- \* Number of trees of productive age in compact plantations
- \* Area under trees of productive age in compact plantations
- Area under trees of nonproductive age in compact plantations

063      FERTILIZERS

- \* Whether inorganic fertilizers applied
- Whether organic manure or other fertilizers applied
- # Amount of inorganic fertilizer applied per crop

**064**      PESTICIDES  
 \* Whether pesticides applied during year  
 # Frequency of pesticide applications per crop

**065**      SEEDS AND YOUNG PLANTS  
 \* Whether high yield variety seeds used during year  
 # Crops with high yielding varieties of seeds  
 # Crops with traditional varieties of seeds

(Note: \* and # See "essential items" paragraph 5.2)

**5.91**    Name of crops grown - For quick reference an alphabetical list of crops with botanical names is given in Appendix 3. Appendix 4 is a more detailed list of crops grouped into two broad classes, temporary and permanent. In Appendix 4, each crop class is subdivided by the end-use of crops, such as human consumption, industrial use or fodder. This crop list in Appendix 4 is not exhaustive nor do all crops listed apply to any one country. Countries may wish to expand or abridge the crop list, taking into account their agricultural practices.

**5.92**    The alphabetical crop list provides cross-referencing to the end use classification by including corresponding item numbers. There are cases where the placement is not obvious; some important examples are given below:

- (a) Barley for grain, alcohol and all other purposes is included under 1.1.4 (Barley).
- (b) Oats for grain and mature oats fed unthreshed to animals are included under 1.1.6, but oats used as fodder crops (for green feed or for silage) are covered under 1.7.3.2.
- (c) Sugar cane used for sugar, juice or chewing is included under 1.4.1.1 (sugar cane), but sugar cane for thatching is under 1.4.5.4 and sugar cane for fodder under 1.7.5.0.7.
- (d) Hemp for fibre under 1.4.4.3 includes hemp for paper mills.
- (e) Vegetables grown principally for human consumption are under 1.5; vegetables grown principally for fodder are under 1.7.5; and vegetables grown only for seed are under 1.8.

**5.93**    Different time references are proposed for various items of this category:

<u>Section N°</u>	<u>Time reference</u>
061	Agricultural year
062	Enumeration day
063	Agricultural year
064	Agricultural year
065	Agricultural year

**5.94**    Area harvested - For a particular crop this refers to total area from which the crop is gathered. In certain regions, some temporary crops are grown more than once on the same land in the same agricultural year (see successive crops, paragraphs 5.97-5.98). In this case, the land is counted as many times as the crop is harvested to obtain area harvested for that crop. The area harvested for temporary crops should exclude uncultivated patches, bunds, footpaths, ditches, headlands, shoulders, shelterbelts, etc., if possible (see definition of gross and net area in paragraph 5.58).

**5.95**    Duplication should be avoided when counting areas under the same crop producing more than one product during the same agricultural year. For example, cotton produces both fibre and seed. In such cases the area harvested should be reported under the principal product. If the same area is also reported for the secondary product, then it is shown in brackets and omitted from the total area harvested.

**5.96**    Pure stand - This is a single crop cultivated alone in a field. A pure stand crop may be either temporary or permanent.

**5.97**    Successive crops - The same crop, or different crops, may be grown and harvested successively on the same land several times during the agricultural year. Successive cropping is

important in countries with more than one cropping season. The field, or parts of it, may be left fallow during one or more cropping seasons in the same agricultural year. The successive crop area should be reported for each crop separately each time the area is sown or planted during the agricultural year. Thus, if two different crops are grown successively on the same field, the field area will appear twice in the results (under each of the two crops concerned), or sometimes more in countries with having more than two cropping seasons. Similar multiple area counting will occur if the same crop is grown successively during the agricultural year. In these cases total harvested or sown area for the agricultural year may be, and usually is, larger than the total physical cropland holding area.

**5.98** Successive harvests from the same standing crops (sugar cane, hay, etc.) should not be confused with successive cropping. Areas for the former should be reported once only. For the latter case, the same crop (such as rice) is sown or planted and harvested more than once during the agricultural year.

**5.99** It is possible for two different holders to grow and harvest a crop from the same land area or parcel where successive crops are common. Successive crop areas grown and harvested by two holders operating in succession should be reported for each holder.

**5.100** Crops cultivated simultaneously - Different crops cultivated simultaneously on the same land can cause difficulties in ascertaining which part of the total area to ascribe to each crop. To determine the crop area harvested in mixed and associated crop cases no firm, single recommendation can be given. What follows are general guidelines.

**5.101** Temporary crops, particularly grains, are grown and harvested as mixtures in some countries. It is best to treat a mixture of this kind as a single crop, without attempting to estimate the area under each crop. Individual crops in the mixture should be specified and the most important constituent crop or crops named. Mixed cereal grain crops, other mixed grain crops and mixed grasses grown for hay are examples.

**5.102** For other crop mixtures it may be practicable and desirable to estimate the area which each crop would have covered had it been grown alone. Various methods are used, or can be devised, to estimate these areas, based on quantities of seed used for crops in the mixture, plant density in temporary or permanent crop mixtures compared with pure stand density, eye estimates of the proportions of area occupied by component crops (if distinguishable), number of plants or trees per area unit, etc. Countries should also use objective sampling methods for important estimates.

**5.103** A crop planted between rows of another crop (e.g., sorghum and groundnuts between cotton rows, or groundnuts between maize or sorghum rows) is referred to as interplanted crops and may be differentiated from mixed temporary crops or associated crops. It is desirable to assign the interplanted crop area to individual crops in proportion to the area occupied by each crop. Yields of some interplanted crops may be as large as when grown alone (for example, sweet potatoes and maize, maize and peas or beans) but the total of area equivalents assigned to individual crops should be equal to the total area under the mixture, even if favourable interactions result in increased yields.

**5.104** When both temporary and permanent crops are grown simultaneously in the same field, each crop is referred to as an associated crop. Associated crops should be distinguished from mixed crops as discussed above. The method used to assign areas under each associated crop may differ among countries due to prevailing agricultural practices. Difficulty in defining estimated area equivalents for mixture components may be encountered. Generally, for associated crops, net harvested areas are reported for temporary crop components, and estimated gross area for permanent crop components.

**5.105** If the permanent crop is a compact plantation (see paragraph 5.107), total gross area may be assigned to it. Compact plantation areas on which associated temporary crops are also grown, are not considered arable land. When reporting land use in Category 05, gross area of compact plantations is assigned to the permanent crop. It is important to estimate net area equivalents under associated temporary crops in compact plantations to calculate aggregate crop area, when the temporary crops are harvested during the agricultural year.

**5.106 Permanent crops of productive age** - This includes permanent crops already bearing fruit or otherwise productive. Most tree crops and some other permanent crops become productive after a certain age. Crops at that stage should be enumerated "of productive age" even if, due to meteorological conditions or other reasons, they have not yielded a harvest during the reference year. Senile or other trees of productive age, but no longer productive, should not be enumerated if it is possible to identify them.

**5.107 Compact plantation** - This includes plants, trees and shrubs planted in a regular and systematic manner. Plants, trees or shrubs forming an irregular pattern but dense enough to permit data collection of area planted, are also considered compact plantation.

**5.108 Scattered plants, trees and vines** - This includes plants, trees, vines and shrubs scattered or isolated so preventing adequate determination of the aggregate area occupied. Countries reporting the area under scattered trees should convert the total number of trees into area by using a standard number of trees per hectare.

**5.109 Fertilizers** - Fertilizers are mineral or organic substances, natural or manufactured, which are applied to soil, irrigation water or a hydroponic medium, to supply plants with the necessary nutrients. The term fertilizers applies to sources of plant nutrients which contain at least 5 percent of one or more of the three primary nutrients (N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O). The term fertilizers is often used in short for naming mineral fertilizers, as defined below. Products with less than 5 percent of combined plant nutrients are called plant nutrient sources.

**5.110 Mineral fertilizers** - Mineral fertilizers are those fertilizers that are manufactured, usually through an industrial process. Manufacturing entails mechanical enrichment, simple crushing or more elaborate chemical transformation of one or more raw materials. The term chemical fertilizers which is frequently used for these products is inadequate and misleading. It should be avoided. The term artificial fertilizers is even less appropriate. Compared to organic sources of plant nutrients mineral fertilizers are characterized by a higher plant nutrient content and a lower bulk.

**5.111 Organic sources** - Materials of organic origin, either natural or processed, can be used as sources of plant nutrients. The term organic fertilizers which is frequently used for organic sources of plant nutrients is not always justified as in some cases they fail to meet the minimum content of 5 percent of one or more of the three primary nutrients. This criterion would be met by some organic materials of animal origin - such as guano, bone meal, fish meal, blood - but would not apply to the more commonly used organic sources of nutrients such as manure, slurry, compost or sewage sludge.

**5.112** The term manure is usually used in the sense of farmyard or animal manure which is a mixture of solid excreta of animals with litter used for their bedding. The term green manure describes fresh plant material which is locally produced and is worked into the soil without composting or digestion through animals. Slurry is a mixture of liquid and solid animal excreta, with or without dilution with water. Sludge is residual organic material derived from sewage. Compost consists of organic materials of animal, plant or human origin partially decomposed through fermentation; sometimes mineral fertilizers are added.

**5.113 Pesticides** - These include insecticides, fungicides, fumigants, herbicides, rodenticides and various other materials, mostly synthetic chemicals produced in concentrated form but diluted for application with various substances such as water, talc, clays, kerosene, etc. They are used for mitigating, controlling or eliminating pests troublesome to crops or livestock.

#### **Category 07: Livestock**

**5.114** Category 07 identifies the type of livestock system forming part of the holding and the livestock population at the time of the census.



## 5.115 Proposed items:

- 071      LIVESTOCK PRODUCTION SYSTEM  
 \* Type of livestock production system  
     Nomadic or totally pastoral  
     Semi-nomadic or semi-pastoral  
     Sedentary pastoral  
     Ranching
- 072      \* ANIMAL NUMBERS, BY TYPE, AGE, SEX and PURPOSE  
 (For each relevant kind of livestock in the country)  
     Cattle  
     Buffaloes  
     Sheep  
     Goats  
     Pigs  
     Horses  
     Camels  
     Mules and hinnies  
     Asses
- 073      POULTRY  
 \* Chickens  
     Ducks  
     Geese  
     Turkeys  
     Guinea fowls  
     Pigeons  
     Others poultry
- 074      OTHER DOMESTICATED ANIMALS  
     Beehives and bee colonies  
     Rabbits and hares  
     Llamas and alpacas  
     Fur-bearing animals (reared in captivity for fur or skin)  
         Foxes  
         Minks  
         Other fur-bearing animals n.e.s.  
     Others n.e.s. (e.g. reindeer, zebras, ostriches, elephants)

**(Note: \* See "essential items" paragraph 5.2)**

5.116 The time reference for items in Category 07 is the day of enumeration.

5.117 Livestock system - This refers to the general characteristics and practices of raising livestock. Four different systems are identified:

- (a) Nomadic or totally pastoral - livestock kept by holders who have no permanent place of residence and do not practise regular cultivation.
- (b) Semi-nomadic or semi-pastoral - livestock kept by holders that establish permanent residence for several months or years and may cultivate crops as a supplementary food source, but move herds on transhumance to assure forage and water.
- (c) Sedentary pastoral - livestock keeping combined usually with crop cultivation carried out by holders with permanent residence.
- (d) Ranching - livestock kept on ranches, normally large areas for extensive grazing.

**5.118 Livestock population** - The livestock population refers to animal numbers present on the holding on the reference date, regardless of ownership. It includes livestock temporarily on communal grazing land (see paragraph 5.9(h)), or in transit at enumeration time.

### **Category 08: Machinery and Equipment**

**5.119** Category 08 identifies machinery and equipment used on the holding, wholly or partly for agricultural production. All machinery and equipment used exclusively for non-agricultural purposes during the reference period are excluded. Only machinery and equipment in usable condition should be reported.

**5.120** Proposed items:

081            STATIONARY POWER PRODUCING MACHINERY

Number used on the holding by type

082            ALL OTHER MACHINERY AND EQUIPMENT

Whether used on holding by main source and by type

Source classes:

Owned solely by holder

Owned jointly by holder and others

Provided by landlord

Provided by other private holders (excluding cooperatives)

Provided by cooperative

Provided by a private agricultural service establishment

Provided by a government agency.

**5.121** The time reference for number of "stationary power producing machinery" is the day of enumeration. For data on other machinery and equipment which refer to use the time reference is the agricultural year.

**5.122 Stationary machinery** - Machinery in a fixed place (e.g. grain mill) or transportable machine (grain thresher) which does not move while in use.

**5.123** Short definitions follow on the most common forms of machinery:

Internal combustion engine - power derived from combustion of vaporized fuel and air in engine chamber	Single-axle tractor - two-wheeled tractor with pedestrian operator
External combustion engine - fluid vaporized in boiler, expanded in turbine, condensed and recycled to boiler	Power tiller - cuts soil with power-driven transverse shaft mounted with knives or tines
Windmill - device converting energy from moving air to mechanical work	Plough - various types designed to lift and turn soil, including harrows and cultivators
Electric generator - converts mechanical energy to electrical energy	Rotary tiller - horizontal vertical power-driven shaft with knives or tines
Electric motor - converts electrical energy to mechanical energy	Rotary harrow - toothed gangs rotating on axles
Track-laying tractor - tractor which travels on tracks or treads laid by endless belt	Disk harrow - two opposed gangs of disk blades set at angles with direction of travel
Four-wheel tractor - tractor with two axles and four wheels	Grain drill - mechanical seeding device which places seed uniformly
	Broadcast seeder - revolving brushes scatter seed from hopper

Cultivator - cutting knives rip and raise soil	Digger, potato harvester - implements used to harvest root crops
Manure spreader - distributes solid or liquid manure	Sugar beet harvester - severs beet tops and lifts roots from soil
Fertiliser broadcaster - distributes mineral or organic fertilizers	Reaper-binder - binds cereals
Sprayer - applies pesticides by forcing liquid through nozzle	Thresher - separates grain from straw
Duster - applies pesticides in powder form by blower	Grain cleaner - removes weed and dirt from harvested grain
Mower - cutter of grass crops	Sorters and graders - separates products by size
Hayrake - gathers hay into loose piles for later mechanical loading or baling	Milking machine - mechanical device for milking cows
Haybaler - picks up and compresses hay into bales	Milk cooler - holds and cools milk using jacket of chilled water
Forage harvester - cuts, chops and loads green crops	Cream separator - revolving disks separate cream by centrifugal force
Forage blower - fills silo by blowing chopped material up tower	Incubator - hatches eggs by artificial heat
Combine - cuts and gathers cereals, threshes, separates seed, chaff and straw	Bulldozer - tracked tractor with front-mounted blade
Corn picker - removes corn ears from standing stalks	Carriall - heavy excavating device
	Land plane - planes or smooths land

**5.124 Transport equipment** - Equipment used primarily for agricultural purposes to transport agricultural goods of the holding, members of the holder's household, or labourers and employees. Motor vehicles, such as jeeps, primarily used as tractors should be reported under tractors.

**5.125 Office machinery and equipment** - This includes computers, calculators, typewriters and office equipment, including furniture. Machinery and equipment classified as fixed capital have a life-use of one year or more. Equipment of small value, such as office desk equipment and furnishings may be excluded from fixed capital.

**5.126 Machinery and equipment source** - This indicates the means by which the holder has obtained the right to use the machinery and equipment.

### **Category 09: Buildings and Other Structures**

**5.127** Category 09 provides information on use of non-residential buildings on the holding. The time reference is the day of enumeration.

**5.128 Proposed items:**

- 091      NON RESIDENTIAL BUILDINGS  
 Whether any non-residential buildings used  
 Tenure (for each non-residential building used)  
 Indication of type of tenure  
     Owned  
     Rented  
     Other (specify)  
 Area or volume  
     For keeping livestock other than poultry (area)  
     For keeping poultry (area)  
     For storing agricultural products (volume)  
     For keeping agricultural machinery and equipment (area)  
     As office (area)  
     For mixed or other purposes (area)

**5.129** Buildings - "A building is any independent free-standing structure comprising one or more rooms or other spaces, covered by a roof and usually enclosed within external walls or dividing walls which extend from the foundations to the roof. However, in tropical areas, a building may consist of a roof with supports only, that is, without constructed walls; in some cases, a roofless structure consisting of a space enclosed by walls may be considered a building" (UN 1980, p.232). A building may be used as living quarters or for industrial or storage purposes exclusively, or it may be partially used for both purposes.

**5.130** Non-residential buildings - These are buildings entirely or primarily intended for agricultural use, such as warehouses, stores, stables, barns, office buildings, etc. Proposed Category 9 items cover only these buildings.

**5.131** Use of non-residential buildings - The various use classes indicated refer to non-residential buildings. A building used for more than one purpose should be recorded as used "for mixed or other purposes".

**Category 10: Other Activities**

**5.132** Category 10 identifies holdings carrying out forestry, fishery and other activities simultaneously with agricultural activities.

**5.133 Proposed items:**

- 101      FORESTRY
- 1011    EXISTENCE OF FOREST TREES ON HOLDING  
             Whether forest trees exist on holding
- 1012    AREA UNDER FOREST TREES  
             Total area  
             # Age of trees  
             # Area reforested last 5 years
- 1013    PRODUCTION DURING YEAR  
             Whether forest products are harvested or not  
             # Value of sales

102 FISHERIES1021 EXISTENCE OF FISHERIES ACTIVITIES ON HOLDING

Whether fish or other aquatic animals and plants are taken from the waters within the holding

1022 \* AQUACULTURE INSTALLATION

Indication of type of aquaculture installation used for fisheries

Pond

Rice fields

Other (specify)

Kind of products

# Value of sales

103 OTHER ACTIVITIES

(Note: \* and # See "essential items" paragraph 5.2)

**5.134** Time reference for items 101 (except 1013) is the day of enumeration; for items 102 and 1013 the time reference is the agricultural year.

**5.135** Forest trees - Forest trees are those grown for producing wood for industry, fuel, forage, protection or other purposes, but not included among trees grown as permanent crops, covered in Category 06. Forest trees include bamboo and other woody vegetation used for the above-listed purposes.

**5.136** Other aquatic animals and plants - These include aquatic animals, other than fish, such as frogs, crabs, etc. and aquatic plants.

**5.137** Aquaculture installations - These include any water environment used for fishery activities in captivity.

## CHAPTER 6

### TABULATION PROGRAMME

*Chapter 6 presents suggestions for the tabulation of data collected in the census of agriculture. It provides a check list of commonly used cross tabulations which countries may use to assist them in developing their tabulation programme. It is emphasized again that the tabulation programme should be developed in coordination with the questionnaire design. Countries should be aware that a tabulation programme does not necessarily meet all the needs for data dissemination. Countries should try to utilize their data base to produce analytical reports on a continuing basis to fully utilize the information from the census programme.*

*This chapter includes also the main classifications suggested for cross tabulations. Countries may have class boundaries they prefer for their needs, however they are urged to report, in addition, results, according to the suggested ranges in order to ensure comparability of national statistical data.*

#### General considerations

**6.1** To meet user needs, the data collected in the agricultural census must be meaningfully summarized as well as fully processed. Summaries are sometimes in the form of totals, averages or percentages providing a quick general understanding of characteristics. Fully processed data should be made available in an easily accessible computer data base conducive to analytical uses. Data are generally summarized in the form of simple tabulations, giving information by classes of a single characteristic, or cross tabulations providing information by classes of two or more characteristics. Cross tabulations based on two characteristics are preferable. Summaries should fully describe the distribution of characteristics.

**6.2** The census tabulation programme refers to the table list and other summary measures published. Sampling errors of some important estimates should also be included if sample enumeration has been used. It is important to produce summary measures which can be evaluated together with those of previous censuses, to study changes over time. The tabulation programme for tables to be published should clearly indicate:

- title of each table
- unit of measurement
- classes adopted for characteristics studied in each table
- aggregate levels, such as administrative units and agro-ecological regions which involve separate tabulations.

**6.3** Because the tabulation programme represents a published census end product, decisions concerning it are directly related to other design aspects of the agricultural census. Cross tabulation requirements must be evaluated concurrently with the census scope. The number of administrative units and agro-ecological regions for which separate tabulations are required is a decisive factor in choosing between complete enumeration, sampling or a combination of both methods.

**6.4** The large volume of work involved in tabulations is an important consideration in preparing the tabulation programme. Available man-power including computer programmers, number of data input stations and computer capacity may impose limitations on the tabulation programme. It is recommended to establish priorities for tables to be included in the tabulation programme and to concentrate efforts on obtaining those tables first (see paragraph 3.56).

**6.5** This Chapter contains a checklist of tables recommended for national or international use. Countries may wish to restrict or augment tabulations to meet their national needs; they are cautioned against excessive cross tabulations if the census is conducted on a sample basis, as sampling errors of the estimates in some cells of tables may be very large due to the small number of sample units in these cells. In both complete and sample enumeration, excessive cross tabulations where some cells contain only one or two units may also impair confidentiality.

**6.6** Numerous combinations of characteristics can be used for cross tabulation purposes. Certain characteristics are identified as the priority ones against which other characteristics are tabulated. These are:

- \* Total area of holding
- \* Total area of agricultural land
- \* Number of livestock
- \* Purpose of production
- Number of permanent workers
- \* Land tenure
- \* Holder's legal status
- Size of holder's household
- \* Holder's age
- \* Holder's sex
- \* Irrigation

(\* Indicates essential items to be collected in a census programme, see paragraph 5.2)

**6.7** Total area of holding, is the most widely used classification. It was proposed in the 1930 Programme and has been recommended for all subsequent census programmes. While total area of holding provides a fairly clear measure of size, particularly for regions with homogeneous land, it has certain serious limitations:

- (a) It may include forest, woodland or other land not used for agricultural purposes, making the total area somewhat misleading as a size measure.
- (b) It disregards land quality: land productivity depends on climate, soil, water availability, etc.; non-irrigated land in an arid or semi-arid region may be much less productive than an equal irrigated area; land at high altitudes may have an entirely different productive capacity from the same land area at a lower level.
- (c) It neglects land use intensity; in some countries, an area may produce two or more crops per year; in others, a crop may be produced only once every two or three years.
- (d) It does not take into account the possible division of holdings into small scattered parcels; a multiplicity of parcels is often equivalent to a reduction in area.

**6.8** Arable land is a useful size criteria for studying holdings engaged mainly in crop production. "Agricultural land" area which includes arable land plus land under protective cover, land under permanent crops, and land under meadows and pastures, is a suitable measure for a farm engaged with crop production and raising livestock.

**6.9** Number of livestock is an appropriate size criterion for holdings engaged mainly in livestock raising. This classification criteria should be used only for the predominant kind of livestock in the country and where livestock keeping is a major activity.

**6.10** Purpose of production is a relevant measure to use in identifying holdings which have little participation in the market structure and utilize production resources primarily for home consumption.

**6.11** Number of permanent workers is useful in studying the labour source used on holdings.

**6.12** Land tenure provides information on access to land by holders. This subject is one of the main areas of concern in the World Conference on Agrarian Reform and Rural Development (WCARRD) Programme of Action.

6.13 Holder's legal status provides a base for comparative analysis of holdings operated by individuals, households, cooperatives, etc.

6.14 Size of holder's household is relevant for understanding the dependence of rural people on land. This is also important in evaluating labour sources, as the household provides unpaid family workers. Because of the difficulty in associating household size with holdings operated by two or more individuals belonging to different households or by two households, it is recommended that holder's household size be considered only for those holdings operated by an individual or single household.

6.15 Holder's age is an important concern in many countries experiencing emigration from rural areas.

6.16 Holder's sex will provide separate data for holdings operated by women. Rural women are one of the disadvantaged groups requiring special attention in all developing countries.

6.17 Irrigation is an important concern in countries where there are competing needs for water resources and agricultural production is dependent on or is utilizing irrigation to increase agricultural production.

#### Classes for main classification criteria

6.18 Chapter 5 suggested and provided definitions for characteristics for collection during the enumeration process. This section suggests classes to use for tabulating results of the enumeration. Countries are urged to adopt these classes to the extent possible to provide internationally comparable results. Countries are also cautioned that using too many classifications may overburden processing capabilities, it is mentioned in paragraph 6.5 that countries may wish to restrict or augment their tabulations to meet national needs. Countries that wish to utilize more detailed classes are recommended to adopt classes which can be regrouped into these suggested classes.

6.19 Total area of holding - This classification covers all holdings. The same classification is recommended for total area of agricultural land.

- (a) Holdings without land
- (b) Holdings with land
  - < 0.1 ha
  - 0.1 - < 0.2 ha
  - 0.2 - < 0.5 ha
  - 0.5 - < 1 ha
  - 1 - < 2 ha
  - 2 - < 3 ha
  - 3 - < 4 ha
  - 4 - < 5 ha
  - 5 - < 10 ha
  - 10 - < 20 ha
  - 20 - < 50 ha
  - 50 - < 100 ha
  - 100 - < 200 ha
  - 200 - < 500 ha
  - 500 - < 1000 ha
  - 1000 - < 2500 ha
  - 2500 ha and over



**6.20 Cropland of holding** - This classification covers all holdings. The same classification is recommended for arable land area.

- (a) Holdings without cropland
- (b) Holdings with cropland
  - < 0.1 ha
  - 0.1 - < 0.2 ha
  - 0.2 - < 0.5 ha
  - 0.5 - < 1 ha
  - 1 - < 2 ha
  - 2 - < 3 ha
  - 3 - < 4 ha
  - 4 - < 5 ha
  - 5 - < 10 ha
  - 10 - < 20 ha
  - 20 - < 50 ha
  - 50 - < 100 ha
  - 100 - < 200 ha
  - 200 - < 500 ha
  - 500 - < 1000 ha
  - 1000 ha and over

**6.21 Number of cattle** - This classification covers all holdings.

- (a) Holdings with no cattle
- (b) Holdings with cattle
  - 1 to 2 head
  - 3 to 4 head
  - 5 to 9 head
  - 10 to 19 head
  - 20 to 49 head
  - 50 to 99 head
  - 100 to 199 head
  - 200 to 499 head
  - 500 head and over

**6.22 Number of buffaloes** - This classification covers all holdings.

- (a) Holdings with no buffaloes
- (b) Holdings with buffaloes
  - 1 to 2 head
  - 3 to 4 head
  - 5 to 9 head
  - 10 to 19 head
  - 20 to 49 head
  - 50 to 99 head
  - 100 to 199 head
  - 200 to 499 head
  - 500 head and over

**6.23** Number of sheep - This classification covers all holdings.

- (a) Holdings with no sheep
- (b) Holdings with sheep
  - 1 to 4 head
  - 5 to 9 head
  - 10 to 19 head
  - 20 to 49 head
  - 50 to 99 head
  - 100 to 199 head
  - 200 to 499 head
  - 500 head and over

**6.24** Number of goats - Same classification as for sheep.

**6.25** Number of pigs - Same classification as for sheep.

**6.26** Number of chickens - This classification covers all holdings.

- (a) Holdings with no chickens
- (b) Holdings with chickens
  - 1 to 9 chickens
  - 10 to 49 chickens
  - 50 to 199 chickens
  - 200 to 999 chickens
  - 1000 to 4999 chickens
  - 5000 to 9999 chickens
  - 10000 chickens and over

**6.27** Purpose of production - This classification applies to all holdings.

- Producing mainly for home consumption
- Producing mainly for sale

**6.28** Number of permanent agricultural workers - This classification covers all holdings

- (a) Holdings without permanent agricultural workers
- (b) Holdings with permanent agricultural workers
  - 1 worker
  - 2 workers
  - 3 workers
  - 4 workers
  - 5 workers
  - 6 workers and over

**6.29** Land tenure - This classification covers all holdings. The breakdown (c) may not be applicable in some cross tabulations.

- (a) Holdings without land

- (b) Holdings operated under one tenure form
  - Owned or held in ownerlike possession
  - Rented from others
    - For an agreed amount of money and/or produce
    - For a share of produce
    - In exchange for services
    - Under other rental arrangements
  - Operated on a squatter basis
  - Operated under tribal or traditional communal tenure forms
  - Operated under other tenure forms
- (c) Holdings operated under two or more tenure forms
  - Area owned or held in ownerlike possession
  - Area rented from others
    - For an agreed amount of money and/or produce
    - For a share of produce
    - In exchange for services
    - Under other rental arrangements
  - Area operated on a squatter basis
  - Area operated under tribal or traditional communal tenure forms
  - Area operated under other tenure forms

**6.30** Holder's legal status - This classification covers all holdings.

- (a) Holdings operated privately
  - an individual
  - a household
  - two or more individuals of different households or two or more households
  - a corporation
  - a cooperative
  - other n.e.s.
- (b) Holdings operated by the Government

**6.31** Size of holder's household - This classification covers only those holdings operated by an individual or a household. Other holdings are excluded.

- 1 person
- 2 to 3 persons
- 4 to 5 persons
- 6 to 9 persons
- 10 persons and over

**6.32** Holder's age - This classification applies only to holdings operated by an individual, a household, two or more individuals of different households or two or more households. It excludes other holdings. In the case of holdings operated by a household, two or more individuals of different households or two or more households, one senior holder should be selected.

- Under 25 years
- 25 to 34 years
- 35 to 44 years
- 45 to 54 years
- 55 to 64 years
- 65 years and over

**6.33** Holder's sex - Explanations given above for holder's age, equally apply here.

- Male
- Female

**6.34 Irrigation - Holdings that do not irrigate any land.**

Holdings that irrigate some land  
 Area irrigated  
 Area with irrigation potential

**Classes for other characteristics****CATEGORY 01**

**6.35 Administrative units and agro-ecological regions -** Classes by administrative units and agro-ecological zones depend on country circumstances.

**CATEGORY 02**

**6.36 Integration with another economic unit -** This classification covers all holdings.

Holdings that are part of an enterprise also engaged in another economic activity.  
 Holdings that are not part of an enterprise engaged in another economic activity.

**6.37 Other economic activities of enterprises operating a holding -** This classification applies to holdings that are part of an enterprise also engaged in another economic activity.

- (a) Single economic activity other than operating a holding
  - Agricultural services
    - Hunting, trapping and game propagation
    - Forestry and logging
    - Fishing
    - Manufacturing
    - Other (specify)
- (b) Two or more economic activities other than operating a holding

**6.38 Hired manager**

Holdings with a hired manager  
 Holdings without a hired manager

**CATEGORY 03**

**6.39 Age of holder's household members -** The first three age groups are combined for the holder when cross-classifying holder's age (see holder's age).

Under 10 years  
 10 to 14 years  
 15 to 24 years  
 25 to 34 years  
 35 to 44 years  
 45 to 54 years  
 55 to 64 years  
 65 years and over

**6.40 Sex of holder's household members**

Male  
 Female

**CATEGORY 04**

**6.41** Activity status - This classification covers holder's household members above a specified age  
- see paragraph 6.39

Economically active  
Not economically active

**6.42** Number of holder's household members economically active.

1 person  
2 persons  
3 persons  
4 persons  
5 persons or more

**6.43** Work of household members on holding - This classification applies to economically active members of holder's household.

Occasional agricultural worker on holding  
Permanent agricultural worker on holding  
Not working on holding

**6.44** Holder's occupations - Not having any other occupation besides being a holder.

Having other occupation(s) besides being a holder, with main occupation of  
Farmer  
Agricultural worker  
Other (specify)

**6.45** Employment of agricultural workers

Holdings that employ agricultural workers only on a permanent basis  
Holdings that employ agricultural workers only on an occasional basis  
Holdings that employ agricultural workers both on permanent and occasional basis  
Holdings that do not employ agricultural workers

**6.46** Sex of permanent agricultural workers

Male  
Female

**CATEGORY 05**

**6.47** Number of parcels

1 parcel  
2 to 3 parcels  
4 to 5 parcels  
6 to 9 parcels  
10 parcels and more

**6.48** Land rented out

Holdings that rent out land  
Holdings that do not rent out land

**6.49** Shifting cultivation

Holdings practising shifting cultivation  
Holdings not practising shifting cultivation

**6.50** Drainage

Holdings having drainage facilities  
Holdings not having drainage facilities

**6.51** Size of parcels

< 0.1 ha  
0.1 - < 0.2 ha  
0.2 - < 0.5 ha  
0.5 - < 1 ha  
1 - < 2 ha  
2 - < 5 ha  
5 - < 10 ha  
10 ha and over

**6.52** Land use

## (a) Productive land

Agricultural land  
Cultivated land  
Cropland  
Arable land  
Land under temporary crops - in open air  
Land under temporary meadows  
Land temporarily fallow  
All other arable land  
Land under protective cover  
Land under permanent crops - in open air  
Land under permanent meadows and pastures  
Cultivated  
Naturally grown

## (b) Woodland or forest

## (c) All other land

Unused and undeveloped potentially productive land  
Land in holding n.e.s.

## (d) Total land

**6.53** Time elapsed since clearance for cultivation (in shifting cultivation)

Area cleared less than 1 year ago  
Area cleared 1 year and less than 2 years ago  
Area cleared 2 years and less than 5 years ago  
Area cleared 5 years ago or earlier

**CATEGORY 06****6.54** Area harvested

For each temporary crop grown

- < 1 ha
- 1 - < 2 ha
- 2 - < 5 ha
- 5 - < 10 ha
- 10 - < 20 ha
- 20 ha and over

**6.55** Plantation features and ages of permanent crops

For each permanent crop  
 Trees of productive age in compact plantations  
 Trees of non-productive age in compact plantations  
 Scattered trees

**6.56** Fertilizers

- (a) Holdings that do not use fertilizers
- (b) Holdings that use fertilizers
  - Only inorganic fertilizers
  - Only organic fertilizers
  - Both types of fertilizers
- (c) Amount of organic fertilizer applied per crop

**6.57** Pesticides

- (a) Holdings that do not use pesticides
- (b) Holdings that use pesticides

**6.58** Seeds

- (a) Holdings that use high yield variety seeds
- (b) Holdings that do not use high yield variety seeds

**CATEGORY 07****6.59** Livestock system

Nomadic or totally pastoral  
 Semi-nomadic or semi-pastoral  
 Sedentary pastoral  
 Ranching

**CATEGORY 08****6.60** Indication of machinery and equipment used and source for each type

- (a) Holdings that do not use machinery and equipment
- (b) Holdings that do use machinery and equipment
  - Owned solely by holder
  - Owned jointly by holder and others
  - Provided by landlord
  - Provided by other private holders (excluding cooperatives)
  - Provided by private cooperative

Provided by a private agricultural service establishment  
 Provided by a government agency

### **CATEGORY 09**

#### **6.61 Use of non-residential buildings**

Holdings that use non-residential buildings  
 Holdings that do not use non-residential buildings

#### **6.62 Use of non-residential buildings owned**

For keeping livestock, other than poultry  
 For keeping poultry  
 For storing agricultural products  
 For keeping agricultural machinery and equipment  
 As office  
 For mixed or other purposes

### **CATEGORY 10**

#### **6.63 Existence and area of forest trees**

Holdings with no area under forest  
 Holdings with an area under forest  
   < 1 ha  
   1 - < 5 ha  
   5 - < 10 ha  
   10 ha and over  
 Holdings harvesting forest products  
   Age of trees  
     Under 5 years  
     5 years +  
 Value of sales

#### **6.64 Fisheries activity and cultural installation**

Holdings that do not carry out fisheries activity  
 Holdings that carry out fisheries activity  
   in pond  
   in rice fields  
   in other cultural installations  
 Kind of products  
 Value of sales

### **Check list of cross tabulations**

**6.65** The following figure gives a check list of commonly used cross tabulations which are indicated with an (x). The row headings list the main characteristics as detailed in Chapter 5, with Category O1 (holding location information) omitted because all tables need to be cross-tabulated by administrative area and agro-ecological region. Columns 1 to 11 set out the main classification criteria (see paragraphs 6.18-6.34)

**6.66** Some items appear in both row and column because certain cross tabulations are needed, but they are indicated only once to avoid repetition.



6.67 Statistics presented in the checklist refer to either numbers of holdings, livestock, parcels, trees, etc., or areas, according to the criteria used. Clarification is needed for: Number of holdings and Number of holdings reporting. In classifications where a holding is included in only one cell, the number of holdings in each cell refers to a mutually exclusive subset of all holdings being studied. However, not all classifications have this property: some require holdings to be allocated to more than one cell. In such cases, the total should indicate number of holdings reporting instead of number of holdings. For example, to classify holdings by total area, the concept number of holdings is appropriate as each holding will fall into only one size class. On the other hand, to classify the holdings by land use, the concept number of holdings reporting should be used because a holding having two types of land, such as area under permanent crops and area under woodland or forest, will appear twice in the classification.

## CROSS TABULATIONS CHECK LIST

Characteristic headings	Holdings and characteristics of holdings to be classified by										
	Total area of holding	Total area of agricultural land	Number of livestock	Purpose of production	Number of permanent workers	Land tenure	Holder's legal status	Size of household	Holder's age	Holder's sex	Irrigation
	1	2	3	4	5	6	7	8	9	10	11
<b>Category 02 - General characteristics</b>											
Holder's legal status	X	-	-	X	X	X	-	-	-	-	X
Use of hired manager	X	-	-	X	-	-	-	-	-	-	-
Other economic activities	X	-	-	X	-	-	-	-	-	-	-
Purpose of production	X	X	-	-	X	X	X	X	X	X	X
<b>Category 03 - Demographic characteristics</b>											
Holdings by size of holder's household	X	X	-	-	-	X	-	-	X	X	-
Holdings and members of their households by sex and age	X	-	-	-	-	X	-	-	-	X	-
Holdings and members of their households by education	X	-	-	-	-	X	-	-	-	X	-
Holdings and members of their households by marital status	X	-	-	-	-	X	-	-	-	X	-
<b>Category 04 - Employment</b>											
Holdings and members of their households economically active by age and sex	X	-	-	X	-	X	-	-	-	X	-
Holdings and members of their households by main occupation	X	-	-	X	-	X	-	-	-	X	-
Holdings and members of their households by type of work (permanent, occasional)	X	-	-	X	-	X	X	-	-	X	-
Holdings by number of permanent workers (members of holder's household and hired)	X	-	-	X	-	X	X	-	-	X	-
Holdings hiring permanent and occasional workers	X	-	-	-	-	-	X	-	-	-	-
Hired permanent workers by sex and skilled or unskilled	X	-	-	-	-	-	X	-	-	-	-
<b>Category 05 - Land and water</b>											
Number and area of holdings	X	X	X	X	X	X	X	X	X	X	X
Number of parcels by size of parcels	X	-	-	-	-	-	-	-	-	-	X
Tenure of land	X	-	-	-	X	-	-	X	X	X	X
Land use	X	X	-	-	-	-	-	-	X	X	X
Land by irrigation	X	X	-	-	-	X	-	-	-	-	-
Land under shifting cultivation by year cleared	X	-	-	-	-	-	-	-	X	X	-

Characteristic headings	Holdings and characteristics of holdings to be classified by										
	Total area of holding	Total area of agricultural land	Number of livestock	Purpose of production	Number of permanent workers	Land tenure	Holder's legal status	Size of household	Holder's age	Holder's sex	Irrigation
	1	2	3	4	5	6	7	8	9	10	11
<b>Category 06 - Crops</b>											
Major temporary crops	X	X	-	X	X	X	X	-	X	X	X
Other temporary crops	X	X	-	X	-	X	X	-	X	X	-
Major permanent crops	X	X	-	X	X	X	X	-	X	X	X
Other permanent crops	X	X	-	X	-	X	X	-	X	X	-
Use of fertilizers	X	-	-	X	-	-	-	-	-	X	X
Use of pesticides	X	-	-	X	-	-	-	-	-	X	X
Use of high yielding crop varieties	X	-	-	X	-	-	-	-	-	X	X
<b>Category 07 - Livestock</b>											
Holdings by livestock production system	X	X	X	X	X	-	X	X	-	-	-
Holdings by number of livestock (for each relevant kind of livestock)	X	X	X	-	X	X	X	-	X	X	-
Livestock by sex, age and purpose (for each relevant kind of livestock)	X	X	-	X	X	X	X	-	X	X	-
Poultry (for each species)	X	X	-	X	X	X	X	-	X	X	-
<b>Category 08 - Machinery and equipment</b>											
Number of stationary power-producing machinery by source of supply	X	X	-	X	-	X	-	-	X	X	-
Use of other agricultural machinery by source of supply	X	X	-	X	-	X	-	-	X	X	X
<b>Category 09 - Buildings and other structures</b>											
Use of non-residential buildings by tenure	X	-	X	X	-	-	-	-	-	X	X
Area and volume of non-residential buildings by purpose	X	-	X	X	-	-	-	-	-	X	-
<b>Category 10 - Other activities</b>											
Number and area of forest trees	X	-	-	X	-	-	X	-	X	X	-
Fishery activities and kind of aquaculture installations	X	-	-	X	-	-	X	-	X	X	X

## REFERENCES

- FAO  
1966 *Quality of statistical data* (by S.S. Zarkovic), Rome.
- FAO  
1967 *Programme for the 1970 World Census of Agriculture*, Rome.
- FAO  
1968 *Statistics and studies for agricultural development planning: a phased programme*, Rome.
- FAO  
1976 *Programme for the 1980 World Census of Agriculture*, Rome.
- FAO  
1978 *Taking agricultural censuses*, Rome. New edition in preparation.
- FAO  
1982 *Estimation of crop areas and yields in agricultural statistics*, Rome.
- FAO  
1986a *Food and Agricultural Statistics in the Context of a National Information System*, Rome.
- FAO  
1986b *Programme for the 1990 World Census of Agriculture*, Rome.
- ILO  
1990 *International standard classification of occupations, ISCO-88*, Geneva.
- UN  
*Recommendations for the preparation of sample survey reports*, 1964 Statistical papers, Series C, No. 1, Rev. 2, New York.
- UN  
1980 *Principles and recommendations for population and housing censuses*, Series M, No. 67, New York.
- UN  
*International recommendations for industrial statistics*, Series M, 1983 No. 48, Rev.1, New York.
- UN  
1990 *International standard industrial classification of all economic activities*, Series M, No. 4, Rev. 3, New York.
- UN  
1990 *Supplementary principles and recommendations for population and housing censuses*, Series M, No.67/Add1, New York.
- UN  
1991 *Provisional central production classification*, Series M, No. 77, New York.

## ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT ISSUES

During the past decade public and governmental concern <sup>1/</sup> over environmental quality has grown considerably. Issues include land degradation, water and air pollution, loss of biologically important flora and fauna, overgrazing, pollution arising from excessive use of pesticides and fertilizers, climate change, etc. Technical work is under way to improve FAO's capacity to incorporate environmental and sustainability <sup>2/</sup> information in development planning, programming and implementation. This includes, *inter alia*, proposals to adjust the System of National Accounts, developing sustainability indicators at the global, national and sub-national levels, establishing targets and thresholds for safe and sustainable agricultural practices, and organising an information system to analyze environmental, social and economic data in an integrated manner.

In many countries environmental information is either unavailable, incomplete or of poor quality. There are questions regarding what to measure and how to measure it. The Programme for WCA 2000 attempts to address some of these issues within the agricultural environment. The census of agriculture has historically collected a considerable amount of social and economic data which are relevant to key environmental indicators. Examples are area under cultivation, other land use within agricultural holdings, man-land and livestock-land ratios, pasture and grazing land etc. Changes in these indicators can be used to measure whether current agricultural practices are sustainable and environmentally safe. There are a number of opportunities in the census questionnaire to collect some additional information. The Census Programme proposes augmenting existing information on agricultural practices by including more information related to soil type, to agro-ecological zones the bio-physical characteristics of land, etc. This type of information should provide a good framework for analyzing production potential based on soil, climate and agricultural production characteristics. Chapter V of this publication indicates several items (marked "#") where relevant questions have been added along with previous questions relating to this topic. In countries where the feasibility of collecting such information has been established the additional data forthcoming can improve the basis for future planning and decision-making.

Because the census is normally held only once a decade it cannot be the means of collecting needed information that is seasonal or episodic in nature including abnormal climatic variations. Nor can it fully address issues related to subsistence levels and the marginal economy in which poor farmers operate. Therefore, data on some indicators, recommended at various international meetings can only be collected through regular agricultural sample surveys. Data on agricultural holdings provided by the census can be used as a frame for such surveys. However, in countries where the existing information system is weak, a sample survey may be organized to obtain an initial assessment of general levels of such indicators.

- 
- 1/ The United Nations Conference on Environment and Development (UNCED) and its follow-up (Agenda 21) is probably the most visible demonstration of global concern about the environment.
  - 2/ Sustainable development is: "the management and conservation of the natural resource base, and the orientation of the technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human need for present and future generations. Such sustainable development (in the agriculture, forestry and fisheries sectors) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technologically appropriate, economically viable and socially acceptable".

**INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION  
OF ALL ECONOMIC ACTIVITIES  
(ISIC, extract of third edition)**

**EXPLANATORY NOTES ON AGRICULTURAL ACTIVITIES**

**A. AGRICULTURE, HUNTING AND FORESTRY (Division 01, 02)**

Division 01: Agriculture, Hunting and Related Service Activities

**011 Growing of crops, market gardening, horticulture**

**0111 Growing of cereals and other crops n.e.c.**

This class includes growing of temporary and permanent crops:

Growing of cereal grains such as rice, wheat and corn (except sweet corn), potatoes, yams, sweet potatoes or cassava (manioc), sugar beet, sugar cane or grain sorghum.

Growing of tobacco, including its preliminary processing.

Growing of oil seeds or oleaginous fruit and nuts including peanuts or soya beans.

Production of seeds of a kind used for sowing, of sugar beet and forage plants (including grasses).

Growing of hop cones, chicory roots or roots and tubers with a high starch or inulin content.

Growing of cotton or other vegetable textile materials and retting of plants bearing vegetable textile fibres (jute, flax, coir), growing of plant materials for plaiting, padding or stuffing or for brushes or brooms. Growing of rubber trees, harvesting of latex and treatment on the plantation of the liquid latex for purposes of transport or preservation. Production of dried leguminous vegetables such as field peas and beans. Growing of plant materials used chiefly in pharmacy or for insecticidal, fungicidal or similar purposes.

Growing of crops not elsewhere classified.

Exclusions: Growing of the following crops is classified in class 0112 (Growing vegetables, horticultural specialties and nursery products): vegetables or melons, horticultural specialties, flowers or production of seeds for sowing plants valued chiefly for flowers or vegetables.

Growing of the following is classified in class 0113, fruit or nuts, beverage crops, spice crops. Gathering of forest products and other wild

growing materials such as cork, resins and balsams is classified in class 0200 (Forestry, logging and related service activities).

**0112 Growing of vegetables, horticultural specialties and nursery products**

This class includes growing of the following crops, in the open or under cover:

Growing of vegetables or melons including: sweet corn, growing or gathering of mushrooms or truffles; olives; capers; marrows; pumpkins; aubergines; fruits of the genus capsicum or pimenta (i.e. "peppers"), or fennel, parsley, chervil, tarragon, cress or sweet marjoram. Growing of fruit bearing vegetables, e.g. cucumbers, tomatoes, etc.

Growing of flowers or flower buds.

Growing or production of horticultural specialties including: seeds for flowers, fruit or vegetables, unrooted cuttings or slips; bulbs, tubers, tuberous roots, corms, crowns or rhizomes.

Growing of living plants for planting or ornamental purposes.

Exclusions: Growing of the following is classified in class 0111 (Growing of cereals and other crops n.e.c.): grains; oleaginous crops; vegetable textile materials; potatoes; tobacco; chicory roots, roots and tubers with a high starch or inulin content; sugar beet, forage crops or grasses.

Growing of the following crops is classified in class 0113 (Growing of fruit, nuts, beverage and spice crops): fruit, nuts or spice crops; coffee, cocoa beans, tea or maté.

Except as otherwise specified, gathering of wild growing materials is classified in class 0200 (Forestry, logging and related service activities). Operation of tree nurseries is also classified in class 0200.

**0113 Growing of fruit, nuts, beverage and spice crops**

This class includes growing of fruit: citrus, tropical pome or stone fruit; small fruit such as

berries; other fruit such as avocados, grapes, guava, dates or bread fruit.

Manufacture of wine when done at the same location where the grapes are grown is included, by exception.

Growing of edible nuts including coconuts.

Growing of beverage crops such as coffee or cocoa beans; tea or maté leaves. Growing of spice crops including: spice leaves (e.g. bay, thyme, basil); spice seeds (e.g. anise, coriander, cumin); spice flowers (e.g. cinnamon); spice fruit (e.g. cloves); or other spices (e.g. nutmeg, ginger).

Exclusions: Growing of nuts used chiefly for oil extraction is classified in class 0111 (Growing of cereals and other crops n.e.c.). Hop cone and chicory root growing are also classified in class 0111.

Growing of fruit bearing vegetables is classified in class 0112 (Growing of vegetables, horticultural specialties and nursery products).

Growing fresh "peppers" and certain vegetables such as parsley and tarragon are also classified in class 0112.

Processing to prepare crop for market is classified in class 0140 (Agricultural and animal husbandry service activities, except veterinary activities).

Except as otherwise specified, gathering of wild growing fruit and nuts is classified in class 0200 (Forestry, logging and related service activities). Manufacture of cocoa is classified in class 1543. Processing of coffee or tea leaves and manufacture of spices are classified in class 1549 (Manufacture of other food products n.e.c.). Manufacture of wines from grapes not produced by the same unit is classified in class 1552.

## **012 Farming of animals**

### **0121 Farming of cattle, sheep, goats, horses, asses, mules and hinnies, dairy farming**

This class includes farming of domestic animals, such as beef cattle, sheep, goats, horses, asses, mules or hinnies. Stud farming and the provision of feed lot services for such animals.

Production of raw milk, bovine semen.

Production of butter, cheese, other dairy products as secondary activity does not change the classification of the unit.

Sheep shearing by the sheep owner.

Exclusions: Animal boarding, care and breeding are classified in class 0140 (Agricultural and

animal husbandry service activity, except veterinary activities).

Sheep shearing on a fee or contract basis is also classified in class 0140.

Pulled wool is a product of slaughterhouse operation which is classified in class 1511 (Production, processing and preserving of meat and meat products).

Processing of milk outside the farm is classified in class 1520 (Manufacture of dairy products).

### **0122 Other animal farming, production of animal products n.e.c.**

This class includes raising of live domesticated animals other than those of class 0121, e.g. swine and poultry.

Raising in captivity of semi-domesticated or wild live animals including birds, reptiles, insects, rabbits, mink.

Production of fur skins, reptile or bird skins from ranching operation.

Operation of dog and cat farms, worm farms, land mollusc farms, frog farms.

Production of live animals products such as eggs, honey and silkworm cocoons.

Operation of poultry hatcheries.

Exclusions: Production of hides and skins originating from hunting and trapping is classified in class 0150 (Hunting, trapping and game propagation, including related service activities), from slaughterhouses in class 1511 (Production, processing and preserving of meat and meat products), respectively.

Operation of fish farms and fish hatcheries is classified in class 0500.

### **013 0130 Growing of crops combined with farming of animals (mixed farming)**

This class includes crop growing in combination with farming of animals such as sheep or meat cattle at mixed activity units with a specialization ratio in either one of less than 66 percent.

Exclusions: Mixed cropping or mixed livestock units are classified according to their main activity.

## ALPHABETICAL LIST OF CROPS, BOTANICAL NAME AND CODE NUMBER

CROP	BOTANICAL NAME	CROP CODE NUMBER
Abaca (Manila hemp)	Musa textilis	2.2.4.1
Alfalfa for fodder	} Medicago sativa	1.7.1.1
Alfalfa for seed		1.8.2
Almond	Prunus dulcis	2.1.7.1
Anise seeds	Pimpinella anisum	1.4.3.4
Apple	Malus sylvestris	2.1.2.1
Apricot	Prunus armeniaca	2.1.3.1
Areca (betel nut)	Areca catechu	2.2.7.6
Arracha	Arracacia xanthorrhiza	1.2.9
Arrowroot	Maranta arundinacea	1.2.5
Artichoke	Cynara scolymus	1.5.1.0.1
Artichoke, Jerusalem	Helianthus tuberosus	1.7.5.0.2
Asparagus	Asparagus officinalis	1.5.1.0.2
Avocado	Persea americana	2.1.6.0.1
Bajra (millet)	Pennisetum americanum	1.1.5.1.2
Bambara groundnuts	Vigna subterranea	1.3.9
Banana	Musa paradisiaca	2.1.6.0.2
Barley	Hordeum vulgare	1.1.4
Bean, dry, edible	Phaseolus vulgaris	1.3.1
Bean, harvested green	Phaseolus vigna spp.	1.5.4.1
Beet, fodder (mangel)	} Beta vulgaris	1.7.5.0.5
Beet, red		1.5.3.5
Beet, sugar	} Beta vulgaris	1.4.1.2
Beet, sugar for fodder		1.7.5.0.6
Bergamot	Citrus bergamia	2.1.1.6
Betel nut	Areca catechu	2.2.7.6
Blackberry	Rubus spp.	2.1.5.7
Black pepper	Piper nigrum	2.2.3.1
Black wattle	Acacia mearnsii	2.2.5.2
Blueberry	Vaccinium spp.	2.1.5.1
Brazil nut	Bertholletia excelsa	2.1.7.6
Breadfruit	Artocarpus altilis	2.1.6.0.3
Broad bean, dry	} Vicia faba	1.3.2
Broad bean, harvested green		1.5.4.3
Broccoli and cauliflower	Brassica oleracea botrytis	1.5.5.1
Broom millet	} Sorghum bicolor	1.4.5.4
Broom sorghum		1.4.5.4
Brussels sprouts	Brassica oleracea gemmifera	1.5.1.0.3
Buckwheat	Fagopyrum esculentum	1.1.9
Cabbage (red, white, Savoy)	Brassica oleracea capitata	1.5.1.0.4
Cabbage, Chinese	Brassica rapa	1.5.1.0.7
Cabbage, for fodder	Brassica spp.	1.7.5.0.1
Cacao (cocoa)	Theobroma cacao	2.2.1.2
Cantaloupe and other melons	Cucumis melo	1.5.2.0.1
Caraway seeds	Carum carvi	1.4.3.4
Cardamom	Elettaria cardamomum	2.2.3.7
Cardoon	Cynara cardunculus	1.5.1.1.5
Carob	Ceratonia siliqua	2.1.6.1.5



Carrot, edible	}	Daucus carota	1.5.3.1
Carrot, for fodder	}		1.7.5.1.0
Cashew nuts		Anacardium occidentale	2.1.7.2
Cassava (manioc)		Manihot esculenta	1.2.3
Castor bean		Ricinus communis	1.4.2.1.0
Cauliflower and broccoli		Brassica oleracea botrytis	1.5.5.1
Celeriac	}		1.5.3.8
Celery	}	Apium graveolens	1.5.3.8
Chayote		Sechium edule	1.5.2.1.2
Cherry (including sour)		Prunus spp.	2.1.3.2
Chesnut		Castanea sativa	2.1.7.4
Chickpea (gram pea)		Cicer arietinum	1.3.4
Chicory	}		1.4.5.2
Chicory for greens	}	Cichorium intybus	1.5.1.0.6
Chilly, dry	}		1.4.3.1
Chilly, fresh	}	Capsicum spp.	1.5.2.0.2
Chinese cabbage		Brassica rapa	1.5.1.0.7
Cinnamon		Cinnamomum verum	2.2.3.2
Citronella		Cymbopogon nardus	2.2.7.1
Citron		Citrus medica	2.1.1.6
Clementine		Citrus veticulata	2.1.1.2
Clover for fodder	}		1.7.1.2
Clover for seed	}	Trifolium spp.	1.8.3
Clove		Syzygium aromaticum	2.2.3.3
Cocoa (cacao)		Theobroma cacao	2.2.1.2
Coconut		Cocos nucifera	2.2.2.1
Cocoyam		Colocasia spp.; Xanthosoma spp.	1.2.8
Coffee		Coffea spp.	2.2.1.1
Cola		Cola spp.	2.2.1.6
Colza (rapeseed)		Brassica napus	1.4.2.0.5
Corn (maize)	}		1.1.3
Corn (maize), for silage	}	Zea mays	1.7.3.1
Corn (sweet)	}		1.5.5.2
Corn salad		Valerianella locusta	1.5.1.1.5
Cotton	}		1.4.4.1
Cottonseed	}	Gossypium spp.	1.4.2.0.8
Cowpea	}		1.3.6
Cowpea, harvested green	}	Vigna unguiculata	1.5.4.3
Cranberry		Vaccinium spp.	2.1.5.2
Cress		Lepidium sativum	1.5.1.0.8
Cucumber		Cucumis sativus	1.5.2.0.3
Currants		Ribes spp.	2.1.5.3
Custard apple		Annona reticulata	2.1.6.0.4
Dasheen		Colocasia esculenta	1.2.8
Dates		Phoenix dactylifera	2.1.6.0.5
Drumstick tree		Moringa oleifera	2.2.3.8
Dry, bean, edible		Phaseolus spp.	1.3.1
Dry broad bean		Vicia faba	1.3.2
Dry chilli		Capsicum spp.	1.4.3.1
Dry garlic		Allium sativum	1.2.7
Dry onion		Allium cepa	1.2.6
Dry pea, edible		Pisum sativum	1.3.3
Dry pepper		Capsicum spp.	1.4.3.1
Durum wheat		Triticum durum	1.1.1.1.1
			1.1.1.2.1
Durra (sorghum)		Sorghum bicolor	1.1.5.2

Earth pea (bambara groundnut)	<i>Vigna subterranea</i>	1.3.9
Edo (eddoe)	<i>Xanthosoma</i> spp.; <i>Colocasia</i> spp.	1.2.8
Eggplant	<i>Solanum melongena</i>	1.5.2.0.4
Endive	<i>Cichorium endivia</i>	1.5.1.0.9
Esparto grass	<i>Lygeum spartum</i>	1.4.5.4
Fennel	<i>Foeniculum vulgare</i>	1.5.1.1.5
Fenugreek	<i>Trigonella foenumgraecum</i>	1.3.9
Fig	<i>Ficus carica</i>	2.1.6.0.6
Filbert (hazelnut)	<i>Corylus avellana</i>	2.1.7.5
Fique	<i>Furcraea macrophylla</i>	2.2.4.6
Flax for fibre	} <i>Linum usitatissimum</i>	1.4.4.2
Flax for oil seed (linseed)		1.4.2.0.3
Fodder beet (mangel)	<i>Beta vulgaris</i>	1.7.5.0.5
Formio (New Zealand flax)	<i>Phormium tenax</i>	2.2.4.4
Garlic, dry	} <i>Allium sativum</i>	1.2.7
Garlic, green		1.5.3.2
Geranium	<i>Pelargonium</i> spp.; <i>Geranium</i> spp.	1.4.3.2
Ginger	<i>Zingiber officinalis</i>	2.2.3.4
Gooseberry	<i>Ribes</i> spp.	2.1.5.4
Gourd	<i>Langenaria</i> spp; <i>Cucurbita</i> spp.	1.5.2.0.5
Gram pea (chickpea)	<i>Cicer arietinum</i>	1.3.4
Grapefruit	<i>Citrus paradisi</i>	2.1.1.4
Grape	} <i>Vitis vinifera</i>	2.1.4
Grapes for raisins		2.1.4.3
Grapes for table use		2.1.4.2
Grapes for wine		2.1.4.1
Grass esparto	<i>Lygeum spartum</i>	1.4.5.4
Grass, orchard	<i>Dactylis glomerata</i>	1.7.2.1
Grass, Sudan	<i>Sorghum bicolor</i>	1.7.2.1
Green garlic	<i>Allium sativum</i>	1.5.3.2
Green onion	<i>Allium cepa</i>	1.5.3.3
Groundnut (peanut)	<i>Arachis hypogaea</i>	1.4.2.0.1
Guava	<i>Psidium guajava</i>	2.1.6.0.7
Guinea corn (sorghum)	<i>Sorghum bicolor</i>	1.1.5.2
Hazelnut (filbert)	<i>Corylus avellana</i>	2.1.7.5
Hemp fibre	<i>Cannabis sativa</i>	1.4.4.3
Hemp, Manila (abaca)	<i>Musa textilis</i>	2.2.4.1
Hempseed	<i>Cannabis sativa</i>	1.4.2.1.1
Hemp, sunn	<i>Crotalaria juncea</i>	1.4.4.5
Henequen	<i>Agave fourcroydes</i>	2.2.4.2
Henna	<i>Lawsonia inermis</i>	1.4.5.4
Hop	<i>Humulus lupulus</i>	2.2.1.4
Horse bean	<i>Vicia faba</i>	1.3.2
Horseradish	<i>Armoracia rusticana</i>	1.5.3.8
Hybrid maize	<i>Zea mays</i>	1.1.3.1
Indigo	<i>Indigofera tinctoria</i>	1.4.5.4
Jasmine	<i>Jasminum</i> spp.	2.2.6.2
Jerusalem artichoke	<i>Helianthus tuberosus</i>	1.7.5.0.2
Jute	<i>Corchorus</i> spp.	1.4.4.4
Jowar (sorghum)	<i>Sorghum bicolor</i>	1.1.5.2
Kale	<i>Brassica oleracea acephala</i>	1.5.1.1.0
Kapok	<i>Ceiba pentandra</i>	2.2.4.3

Kenaf	Hibiscus cannabinus	1.4.4.5
Kohlrabi	Brassica oleracea gongylodes	1.5.3.6
Lavender	Lavandula spp.	1.4.3.2
Leek	Allium ampeloprasum	1.5.1.1.1
Lemon	Citrus limon	2.1.1.3
Lemon grass	Cymbopogon citratus	2.2.7.7
Lentil	Lens culinaris	1.3.5
Lespedeza	Lespedeza spp.	1.7.1.3
Lettuce	Lactuca sativa	1.5.1.1.2
Liquorice	Glycyrrhiza glabra	1.4.3.3
Lime, sour	Citrus aurantifolia	2.1.1.5
Lime, sweet	Citrus limetta	2.1.1.6
Linseed (flax for oil seed)	Linum usitatissimum	1.4.2.0.3
Litchi	Litchi chinensis	2.1.6.1.5
Loquat	Eriobotrya japonica	2.1.2.5
Lupine	Lupinus spp.	1.3.9
Macadamia (Queensland nut)	Macadamia spp.	2.1.7.6
Mace and nutmeg	Myristica fragrans	2.2.3.5
Maguey	Agave atrovirens	2.2.4.6
Maize (corn)	} Zea mays	1.1.3
Maize (hybrid)		1.1.3.1
Maize, ordinary		1.1.3.2
Maize (corn) for silage		1.7.3.1
Mandarin and tangerine	Citrus reticulata	2.1.1.2
Mangel (fodder beet)	Beta vulgaris	1.7.5.0.5
Mango	Mangifera indica	2.1.6.0.8
Manila hemp (abaca)	Musa textilis	2.2.4.1
Manioc (cassava)	Manihot esculenta	1.2.3
Maslin (mixed cereals)	Mixture of Triticum spp.; Secale cereale	1.1.8
Medlar	Mespilus germanica	2.1.2.4
Melon and cantaloupe	Cucumis melo	1.5.2.0.1
Millet, proso	Penicum miliaceum	1.1.5.1.1
Millet, bajra	Pennisetum americanum	1.1.5.1.2
Millet broom	Sorghum bicolor	1.4.5.4
Millet, bulrush	Pennisetum americanum	1.1.5.1.1
Millet, finger	Eleusine coracana	1.1.5.1.1
Millet, Italian	Setaria italica	1.1.5.1.2
Millet, Japanese	Echinochloa crusgalli	1.1.5.1.2
Millet, pearl	Pennisetum americanum	1.1.5.1.1
Millet and sorghum	Pennisetum americanum; Eleusine coracana; Sorghum bicolor	1.1.5
Mint	Mentha spp.	1.4.3.2
Mulberry for fruit	Morus spp.	2.1.6.1.5
Mulberry for silkworms	Morus alba	2.2.7.2
Mushrooms	Agaricus spp.; Pleurotus spp. Volvariella	1.6.2.2
Mustard	Brassica nigra; Sinapis alba	1.4.2.0.6
Nectarine	Prunus persica	2.1.3.5
New Zealand flax (formio)	Phormium tenax	2.2.4.4
Niger seed	Guizotia abyssinica	1.4.2.1.1
Nutmeg and mace	Myristica fragrans	2.2.3.5
Oats, for fodder	} Avena spp.	1.7.3.2
Oats, for grain		1.1.6
Oil palm	Elaeis guineensis	2.2.2.2
Okra	Abelmoschus esculentus	1.5.2.0.6

Olive	<i>Olea europea</i>	2.2.2.3	
Onion, dry	}	1.2.6	
Onion, green		}	1.5.3.3
Onion seed			1.8.5
Opium	<i>Papaver somniferum</i>	1.4.3.3	
Orange	<i>Citrus sinensis</i>	2.1.1.1	
Orange, bitter	<i>Citrus aurantium</i>	2.1.1.6	
Orchard grass	<i>Dactylis glomerata</i>	1.7.2.1	
Ornamental plants		1.6.1.2	
Palm, oil	<i>Elaeis guineensis</i>	2.2.2.2	
Palm, sago	<i>Metroxylon</i> spp.	2.2.7.3	
Palmyra palm	<i>Borassus flabellifer</i>	2.2.7.4	
Papaya (pawpaw)	<i>Carica papaya</i>	2.1.6.0.9	
Parsnip	<i>Pastinaca sativa</i>	1.5.3.8	
Peach	<i>Prunus persica</i>	2.1.3.3	
Peanut (groundnut)	<i>Arachis hypogaea</i>	1.4.2.0.1	
Pear	<i>Pyrus communis</i>	2.1.2.2	
Pea, edible dry	}	1.3.3	
Pea, harvested green		<i>Pisum sativum</i>	1.5.4.2
Pecan nut	<i>Carya illinoensis</i>	2.1.7.6	
Pepper, black	<i>Piper nigrum</i>	2.2.3.1	
Pepper, dry	<i>Capsicum</i> spp.	1.4.3.1	
Pepper, sweet	<i>Capsicum annuum</i>	1.5.2.0.9	
Persimmon	<i>Diospyros kaki</i> ; <i>Diospyros virginiana</i>	2.1.6.1.0	
Pigeon pea	<i>Cajanus cajan</i>	1.3.7	
Pimento	<i>Capsicum annuum</i>	1.4.3.1	
Pineapple	<i>Ananas comosus</i>	2.1.6.1.1	
Pistachio nut	<i>Pistacia</i> spp.	2.1.7.6	
Plantain	<i>Musa paradisiaca</i>	2.1.6.1.2	
Plum and prune	<i>Prunus domestica</i>	2.1.3.4	
Pomegranate	<i>Punica granatum</i>	2.1.6.1.3	
Pomelo	<i>Citrus grandis</i>	2.1.1.4	
Poppy seed	<i>Papaver somniferum</i>	1.4.2.1.1	
Potato	<i>Solanum tuberosum</i>	1.2.1	
Potato, sweet	<i>Ipomoea batatas</i>	1.2.2	
Prune and plum	<i>Prunus domestica</i>	2.1.3.4	
Pumpkin, edible	}	1.5.2.0.7	
Pumpkin, for fodder		<i>Cucurbita</i> spp.	1.7.5.0.3
Pyrethrum	<i>Chrysanthemum cinerariaefolium</i>	1.4.5.3	
Quebracho	<i>Aspidosperma</i> spp.	2.2.5.3	
Queensland nut (Macadamia)	<i>Macadamia</i> spp.	2.1.7.6	
Quince	<i>Cydonia oblonga</i>	2.1.2.3	
Quinine	<i>Cinchona</i> spp.	2.2.7.5	
Quinoa	<i>Chenopodium quinoa</i>	1.1.9	
Radish	<i>Raphanus sativus</i> (including <i>Cochlearia armoracia</i> )	1.5.3.4	
Ramie and rhea	<i>Boehmeria nivea</i>	2.2.4.5	
Rapeseed (colza)	<i>Brassica napus</i>	1.4.2.0.5	
Raspberry	<i>Rubus</i> spp.	2.1.5.5	
Red beet	<i>Beta vulgaris</i>	1.5.3.5	
Red cabbage	<i>Brassica oleracea capitata</i>	1.5.1.0.4	
Redtop	<i>Agrostis</i> spp.	1.7.2.1	
Rhea and ramie	<i>Boehmeria nivea</i>	2.2.4.5	
Rhubarb	<i>Rheum</i> spp.	1.5.1.1.3	
Rice	<i>Oryza sativa</i> ; <i>Oryza glaberrima</i>	1.1.2	

Rose	Rose spp.	2.2.6.1
Rubber	Hevea brasiliensis	2.2.5.1
Rutabaga or swede	Brassica napus	1.5.3.6
Rye	Secale cereale	1.1.7
Ryegrass seed	Lolium spp.	1.8.4
Safflower seed	Carthamus tinctorius	1.4.2.0.9
Sago palm	Metroxylon spp.	2.2.7.3
Sainfoin	Onobrychis viciifolia	1.7.1.3
Salad, corn	Valerianella locusta	1.5.1.1.2
Salsify	Tragopogon porrifolius	1.5.3.8
Sapodilla	Achras sapota	2.1.6.1.4
Satsuma	Citrus reticulata	2.1.1.2
Savoy cabbage	Brassica oleracea capitata	1.5.1.0.4
Scorzonera	Scorzonera hispanica	1.5.3.8
Sesame	Sesamum indicum	1.4.2.0.7
Shea butter	Butyrospermum paradoxum	2.2.2.4
Sisal	Agave sisiana	2.2.4.2
Sorghum	}	1.1.5.2
Sorghum, broom	}	1.4.5.4
Sorghum, durra	}	1.1.5.2
Sorghum, Guinea corn	} Sorghum bicolor	1.1.5.2
Sorghum, jowar	}	1.1.5.2
Sorghum, sweet	}	1.4.1.3
Sour lime	Citrus aurantifolia	2.1.1.5
Soybean	}	1.4.2.0.2
Soybean hay	} Glycine max	1.7.1.3
Spelt	Triticum spelta	1.1.9
Spinach	Spinacia oleracea	1.5.1.1.4
Spring barley	Hordeum vulgare	1.1.4.2
Spring rye	Secale cereale	1.1.7.2
Spring wheat	}	1.1.1.2
Spring wheat, hard	} Triticum aestivum	1.1.1.2.1
Spring wheat, soft	}	1.1.1.2.2
Sprouts, Brussels	Brassica oleracea gemmifera	1.5.1.0.3
Squash	Cucurbita spp.	1.5.2.0.8
Strawberry	Fragaria spp.	2.1.5.6
Sudan grass	Sorghum bicolor Sudanense	1.7.2.1
Sugar beet	}	1.4.1.2
Sugar beet for fodder	} Beta vulgaris	1.7.5.0.6
Sugar beet for seed	}	1.8.1
Sugarcane for fodder	}	1.7.5.0.7
Sugarcane for sugar	} Saccharum officinarum	1.4.1.1
Sugarcane for thatching	}	1.4.5.4
Sunflower for fodder	}	1.7.5.0.4
Sunflower for oil seed	} Helianthus annuus	1.4.2.0.4
Sunhemp	Crotalaria juncea	1.4.4.5
Swede (rutabaga)	}	1.5.3.6
Swede for fodder	} Brassica napus	1.7.5.0.8
Sweet corn	Zea mays	1.5.5.2
Sweet lime	Citrus limetta	2.1.1.6
Sweet pepper	Capsicum annum	1.5.2.0.9
Sweet potato	Ipomoea batatas	1.2.2
Sweet sorghum	Sorghum bicolor	1.4.1.3
Tangerine and mandarin	Citrus reticulata	2.1.1.2

Tangerine and mandarin	Citrus reticulata	2.1.1.2
Tannia	Xanthosoma sagittifolium	1.2.8
Tapioca (cassava)	Manihot esculenta	1.2.3
Taro	Colocasia esculenta	1.2.8
Tea	Camellia sinensis	2.2.1.3
Teff	Eragrostis abyssinica	1.1.9
Timothy	Phleum pratense	1.7.2.1
Tobacco	Nicotiana tabacum	1.4.5.1
Tomato	Lycopersicum esculentum	1.5.2.1.0
Trefoil	Lotus spp.	1.8.6
Tung tree	Aleurites spp.	2.2.2.4
Turnip, edible	} Brassica rapa	1.5.3.7
Turnip, for fodder		1.7.5.0.9
Urena (Congo jute)	Urena lobata	1.4.4.5
Vanilla	Vanilla planifolia	2.2.3.6
Vetch for grain	Vicia sativa	1.3.8
Walnut	Juglans spp.	2.1.7.3
Watermelon	Citrullus lanatus	1.5.2.1.1
Wattle, black	Acacia mearnsii	2.2.5.2
Wheat	Triticum spp.	1.1.1
White cabbage	Brassica oleracea capitata	1.5.1.0.4
Winter barley	Hordeum spp.	1.1.4.1
Winter rye	Secale cereale	1.1.7.1
Winter wheat	} Triticum aestivum	1.1.1.1
Winter wheat, hard		1.1.1.1.1
Winter wheat, soft		1.1.1.1.2
Yams	Dioscorea spp.	1.2.4
Yerba mate	Ilex paraguariensis	2.2.1.5

## CROP LIST

This crop list is not exhaustive, nor do all crops listed apply to any one country. Crops grown but deleted from the proposed list should be reported under 19: "Other temporary crops n.e.s." or 23: "Other permanent crops n.e.s." To simplify the list, the product name rather than the crop has been used.

### 1 Temporary crops

#### 1.1 Cereals harvested for grain

##### 1.1.1 Wheat

- 1.1.1.1 Winter wheat
  - 1.1.1.1.1 Hard wheat (including durum and semi-hard wheat)
  - 1.1.1.1.2 Soft wheat
- 1.1.1.2 Spring wheat
  - 1.1.1.2.1 Hard wheat (including durum and semi-hard wheat)
  - 1.1.1.2.2 Soft wheat

##### 1.1.2 Rice

- 1.1.2.1 Wetland (lowland)
- 1.1.2.2 Dryland (upland)

##### 1.1.3 Maize (corn)

- 1.1.3.1 Hybrid maize
- 1.1.3.2 Ordinary maize

##### 1.1.4 Barley

- 1.1.4.1 Winter barley
- 1.1.4.2 Spring barley

##### 1.1.5 Millet and Sorghum

- 1.1.5.1 Millet
  - 1.1.5.1.1 Finger millet (for example, pearl millet, bullrush millet)
  - 1.1.5.1.2 Other millet (for example, bajra, Japanese millet)
- 1.1.5.2 Sorghum (for example, jowar, Guinea corn, durra)

##### 1.1.6 Oats

##### 1.1.7 Rye

- 1.1.7.1 Winter rye
- 1.1.7.2 Spring rye

##### 1.1.8 Mixed cereals for grain (for example, maslin spelt, teff)

#### 1.2 Tuber, root and bulk crops

##### 1.2.1 Potato

##### 1.2.2 Sweet potato

##### 1.2.3 Cassava (manioc, tapioca)

##### 1.2.4 Yam

##### 1.2.5 Arrowroot

##### 1.2.6 Dry onion

##### 1.2.7 Dry garlic

- 1.2.8 Taro (cocoyam, dasheen, edoe, tannia)
- 1.2.9 Others n.e.s.

1.3 Leguminous plants mainly for grain (excluding soybean and groundnut)

- 1.3.1 Edible dry beans
- 1.3.2 Dry broad bean (horse bean)
- 1.3.3 Edible dry peas
- 1.3.4 Chick pea (gram)
- 1.3.5 Lentil
- 1.3.6 Cowpea
- 1.3.7 Pigeon pea
- 1.3.8 Vetches
- 1.3.9 Others n.e.s. (for example, lupines, fenugreek, bambara nut)

1.4 Crops mainly for industrial purposes

1.4.1 Sugar crops

- 1.4.1.1 Sugar cane
- 1.4.1.2 Sugar beet
- 1.4.1.3 Others n.e.s. (for example, sweet sorghum)

1.4.2 Oilseed crops

- 1.4.2.0.1 Groundnut (peanut)
- 1.4.2.0.2 Soybean
- 1.4.2.0.3 Flax (linseed)
- 1.4.2.0.4 Sunflower
- 1.4.2.0.5 Rapeseed (colza)
- 1.4.2.0.6 Mustard
- 1.4.2.0.7 Sesame
- 1.4.2.0.8 Cottonseed
- 1.4.2.0.9 Safflower seed
- 1.4.2.1.0 Castor bean
- 1.4.2.1.1 Others n.e.s. (for example, hempseed, poppy seed, niger seed)

1.4.3 Spices, condiments, aromatic and medicinal plants

- 1.4.3.1 Dry peppers, pimento or chilli
- 1.4.3.2 Oil plants for essence (for example, geranium, lavender, mint)
- 1.4.3.3 Medicinal plants (for example, opium, liquorice)
- 1.4.3.4 Others n.e.s. (for example, aniseed, caraway seed)

1.4.4 Fibre crops

- 1.4.4.1 Cotton
- 1.4.4.2 Flax for fibre
- 1.4.4.3 Hemp for fibre
- 1.4.4.4 Jute
- 1.4.4.5 Others n.e.s. (for example, sunn hemp, kenaf, urena)

1.4.5 Other industrial crops

- 1.4.5.1 Tobacco
  - 1.4.5.1.1 Flue-cured
  - 1.4.5.1.1 Other types
- 1.4.5.2 Chicory
- 1.4.5.3 Pyrethrum
- 1.4.5.4 Others n.e.s. (e.g. indigo, heena, broom millet, broom sorghum, esparto grass, sugar cane for thatching)



---

## 1.5 Vegetables mainly for human consumption

### 1.5.1 Leafy or stem vegetables

- 1.5.1.0.1 Artichokes
- 1.5.1.0.2 Asparagus
- 1.5.1.0.3 Brussels sprouts
- 1.5.1.0.4 Cabbage (red, white, savoy)
- 1.5.1.0.5 Celery
- 1.5.1.0.6 Chicory for greens
- 1.5.1.0.7 Chinese cabbage
- 1.5.1.0.8 Cress
- 1.5.1.0.9 Endive
- 1.5.1.1.0 Kale
- 1.5.1.1.1 Leek
- 1.5.1.1.2 Salad crops
- 1.5.1.1.3 Rhubarb
- 1.5.1.1.4 Spinach
- 1.5.1.1.5 Others n.e.s. (for example, cardoon, fennel, corn salad)

### 1.5.2 Fruit-bearing vegetables

- 1.5.2.0.1 Cantaloupe and other melons
- 1.5.2.0.2 Chilli (fresh)
- 1.5.2.0.3 Cucumber
- 1.5.2.0.4 Eggplant
- 1.5.2.0.5 Gourd
- 1.5.2.0.6 Okra
- 1.5.2.0.7 Pumpkin
- 1.5.2.0.8 Squash
- 1.5.2.0.9 Sweet pepper
- 1.5.2.1.0 Tomato
- 1.5.2.1.1 Watermelon
- 1.5.2.1.2 Others n.e.s. (for example chayot)

### 1.5.3 Root, bulb and tuberous vegetables

- 1.5.3.1 Carrot
- 1.5.3.2 Green garlic
- 1.5.3.3 Green onion
- 1.5.3.4 Radish
- 1.5.3.5 Red beet
- 1.5.3.6 Rutabagas or swedes and kohlrabi
- 1.5.3.7 Turnips
- 1.5.3.8 Others n.e.s. (for example, celeriac, horseradish, parsnip, sconzonera, salsify)

### 1.5.4 Leguminous vegetables harvested green

- 1.5.4.1 Beans
- 1.5.4.2 Peas
- 1.5.4.3 Others n.e.s. (for example, broad bean, cowpea)

### 1.5.5 Other vegetables

- 1.5.5.1 Cauliflower and broccoli
- 1.5.5.2 Corn (sweet)
- 1.5.5.3 Others n.e.s.

---

1.6 Special horticultural cultivation

1.6.1 Grown in the open

- 1.6.1.1 Flowers, bulbs and corms
- 1.6.1.2 Ornamental plants
- 1.6.1.3 Others n.e.s.

1.6.2 Cultivation under protective cover (for example, glass, plastic

- 1.6.2.1 Vegetables
- 1.6.2.2 Mushrooms
- 1.6.2.3 Flowers and ornamental plants
- 1.6.2.4 Others n.e.s.

1.7 Fodder crops (for grazing or cut for hay, green feed or silage)

1.7.1 Leguminous forage crops

- 1.7.1.1 Alfalfa
- 1.7.1.2 Clover
- 1.7.1.3 Others n.e.s. (for example, lespedeza, sainfoin, soybean hay)

1.7.2 Grasses

- 1.7.2.1 Grown alone (for example, timothy, red top, orchard grass, Sudan grass)
- 1.7.2.2 Mixed grasses

1.7.3 Cereals

- 1.7.3.1 Maize (corn) for silage
- 1.7.3.2 Oats
- 1.7.3.3 Others n.e.s.

1.7.4 Mixed legumes, grasses and cereals

1.7.5 Other fodder crops, n.e.s.

- 1.7.5.0.1 Cabbage
- 1.7.5.0.2 Jerusalem artichokes
- 1.7.5.0.3 Pumpkin
- 1.7.5.0.4 Sunflower
- 1.7.5.0.5 Mangel (fodder beet)
- 1.7.5.0.6 Sugar beet
- 1.7.5.0.7 Sugar cane
- 1.7.5.0.8 Swede
- 1.7.5.0.9 Turnip
- 1.7.5.1.0 Others n.e.s. (for example, carrot)

1.8 Crops grown mainly for the production of seed

1.8.1 Seed of sugarbeet

1.8.2 Alfalfa seed

1.8.3 Clover seed

1.8.4 Rye-grass seed

1.8.5 Onion seed

1.8.6 Others n.e.s. (for example trefoil)

1.9 Other temporary crops n.e.s.

## 2 Permanent crops

### 2.1 Fruit and nut trees

#### 2.1.1 Citrus fruit

- 2.1.1.1 Oranges
- 2.1.1.2 Mandarin and Tangerine (including clementine and satsuma)
- 2.1.1.3 Lemon
- 2.1.1.4 Grapefruit and pomelo
- 2.1.1.5 Sour lime
- 2.1.1.6 Others n.e.s. (for example, bitter orange, sweet lime, citron, bergamot)

#### 2.1.2 Pome fruit

- 2.1.2.1 Apple
- 2.1.2.2 Pear
- 2.1.2.3 Quince
- 2.1.2.4 Medlar
- 2.1.2.5 Others n.e.s. (for example, loquat)

#### 2.1.3 Stone fruit

- 2.1.3.1 Apricot
- 2.1.3.2 Cherry (including sour)
- 2.1.3.3 Peach
- 2.1.3.4 Plum and prune
- 2.1.3.5 Others n.e.s. (for example, nectarine)

#### 2.1.4 Grapes

- 2.1.4.1 Grapes for wine
- 2.1.4.2 Grapes for table use
- 2.1.4.3 Grapes for raisins

#### 2.1.5 Small cultivated fruit

- 2.1.5.1 Blueberry
- 2.1.5.2 Cranberry
- 2.1.5.3 Currants
- 2.1.5.4 Gooseberry
- 2.1.5.5 Raspberry
- 2.1.5.6 Strawberry
- 2.1.5.7 Others n.e.s. (for example, blackberry)

#### 2.1.6 Other cultivated fruit

- 2.1.6.0.1 Avocado
- 2.1.6.0.2 Banana
- 2.1.6.0.3 Breadfruit
- 2.1.6.0.4 Custard apple
- 2.1.6.0.5 Date
- 2.1.6.0.6 Fig
- 2.1.6.0.7 Guava
- 2.1.6.0.8 Mango
- 2.1.6.0.9 Papaya
- 2.1.6.1.0 Persimmon
- 2.1.6.1.1 Pineapple
- 2.1.6.1.2 Plantain
- 2.1.6.1.3 Pomegranate

- 2.1.6.1.4 Sapodilla
- 2.1.6.1.5 Other n.e.s. (for example, lychee, carob)
- 2.1.7 Edible nuts
  - 2.1.7.1 Almond
  - 2.1.7.2 Cashew
  - 2.1.7.3 Walnut
  - 2.1.7.4 Chestnut
  - 2.1.7.5 Hazelnut (filbert)
  - 2.1.7.6 Other n.e.s. (for example, pecan, pistachio, Brazil, Macadamia (Queensland) but excluding coconut)

## 2.2 Permanent crops mainly for industrial purposes

- 2.2.1 Beverage crops
  - 2.2.1.1 Coffee
  - 2.2.1.2 Cocoa (cacao)
  - 2.2.1.3 Tea
  - 2.2.1.4 Hops
  - 2.2.1.5 Yerba mate
  - 2.2.1.6 Others n.e.s. (for example, cola)
- 2.2.2 Oil crops
  - 2.2.2.1 Coconut
  - 2.2.2.2 Oil palm
  - 2.2.2.3 Olive
  - 2.2.2.4 Others n.e.s. (for example, tung tree, shea butter tree)
- 2.2.3 Spices and aromatic crops
  - 2.2.3.1 Black pepper
  - 2.2.3.2 Cinnamon
  - 2.2.3.3 Clove
  - 2.2.3.4 Ginger
  - 2.2.3.5 Nutmeg and spice
  - 2.2.3.6 Vanilla
  - 2.2.3.7 Cardamon
  - 2.2.3.8 Others n.e.s. (for example, drumstick)
- 2.2.4 Fibre crops
  - 2.2.4.1 Abaca (Manila hemp)
  - 2.2.4.2 Agave plants (for example, drumstick)
  - 2.2.4.3 Kapok
  - 2.2.4.4 New Zealand flax (formio)
  - 2.2.4.5 Ramie and rhea
  - 2.2.4.6 Others n.e.s. (for example, fique, maguey)
- 2.2.5 Rubber and tanning crops
  - 2.2.5.1 Rubber (hevea)
  - 2.2.5.2 Black wattle
  - 2.2.5.3 Quebracho
  - 2.2.5.4 Others n.e.s.
- 2.2.6 Flower crops
  - 2.2.6.1 Roses
  - 2.2.6.2 Jasmine
  - 2.2.6.3 Others n.e.s.

---

2.2.7 Other industrial crops

2.2.7.1 Citronella

2.2.7.2 Mulberry for silkworms

2.2.7.3 Sago palm

2.2.7.4 Palmyra plam

2.2.7.5 Quinine

2.2.7.6 Areca (betel) nut

2.2.7.7 Others n.e.s. (for example, lemon grass)

2.3 Other permanent crops n.e.s.





