



Global Strategy to improve Agricultural and Rural Statistics

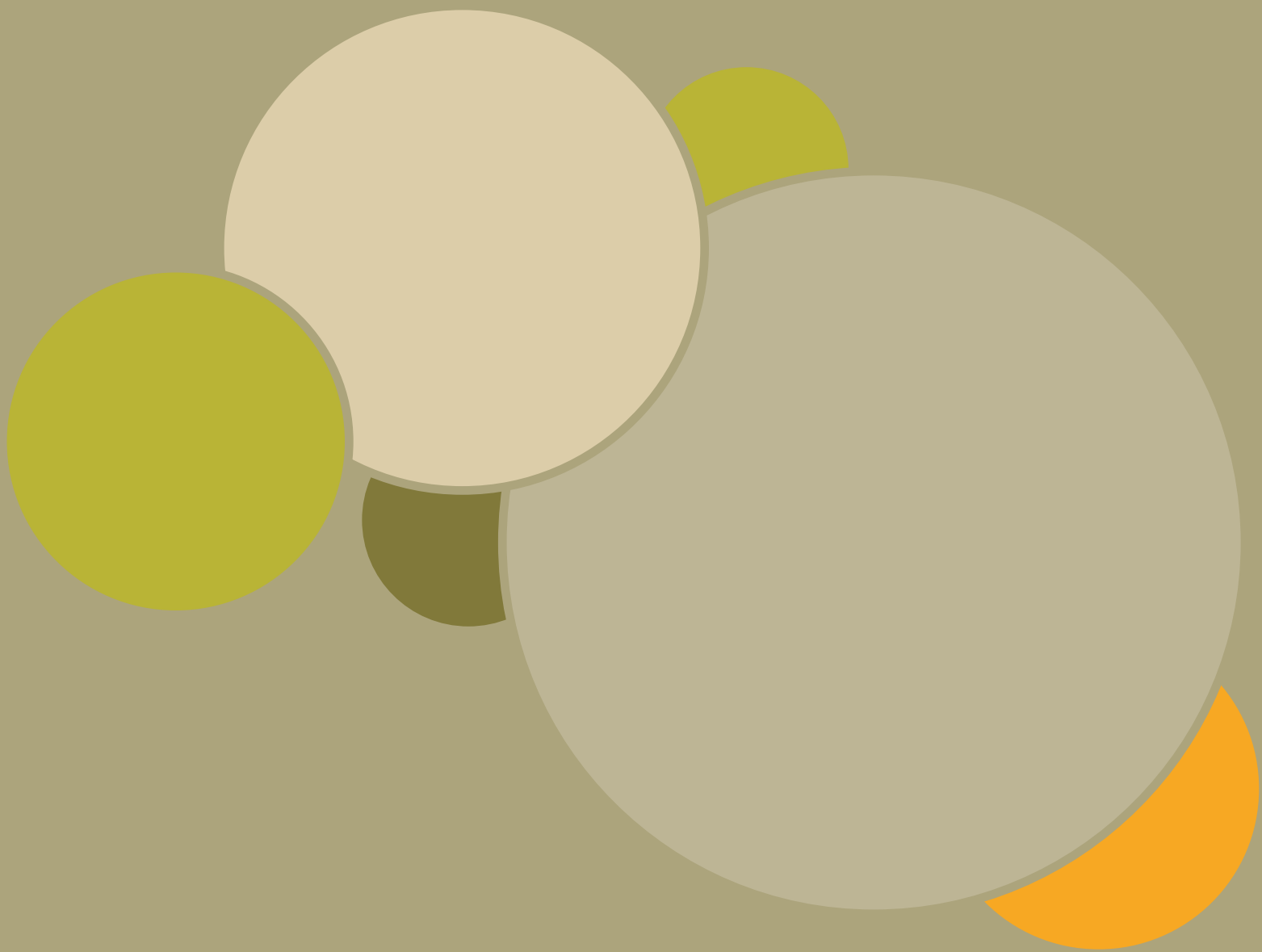
A large graphic composed of several overlapping circles in various shades of green, brown, and orange. The circles are arranged in a way that they appear to be part of a larger, abstract design. The text 'TRAINING IN AGRICULTURAL STATISTICS (Syllabus)' is centered within one of the larger circles.

TRAINING
IN AGRICULTURAL
STATISTICS
(Syllabus)

Global Strategy to improve Agricultural and Rural Statistics

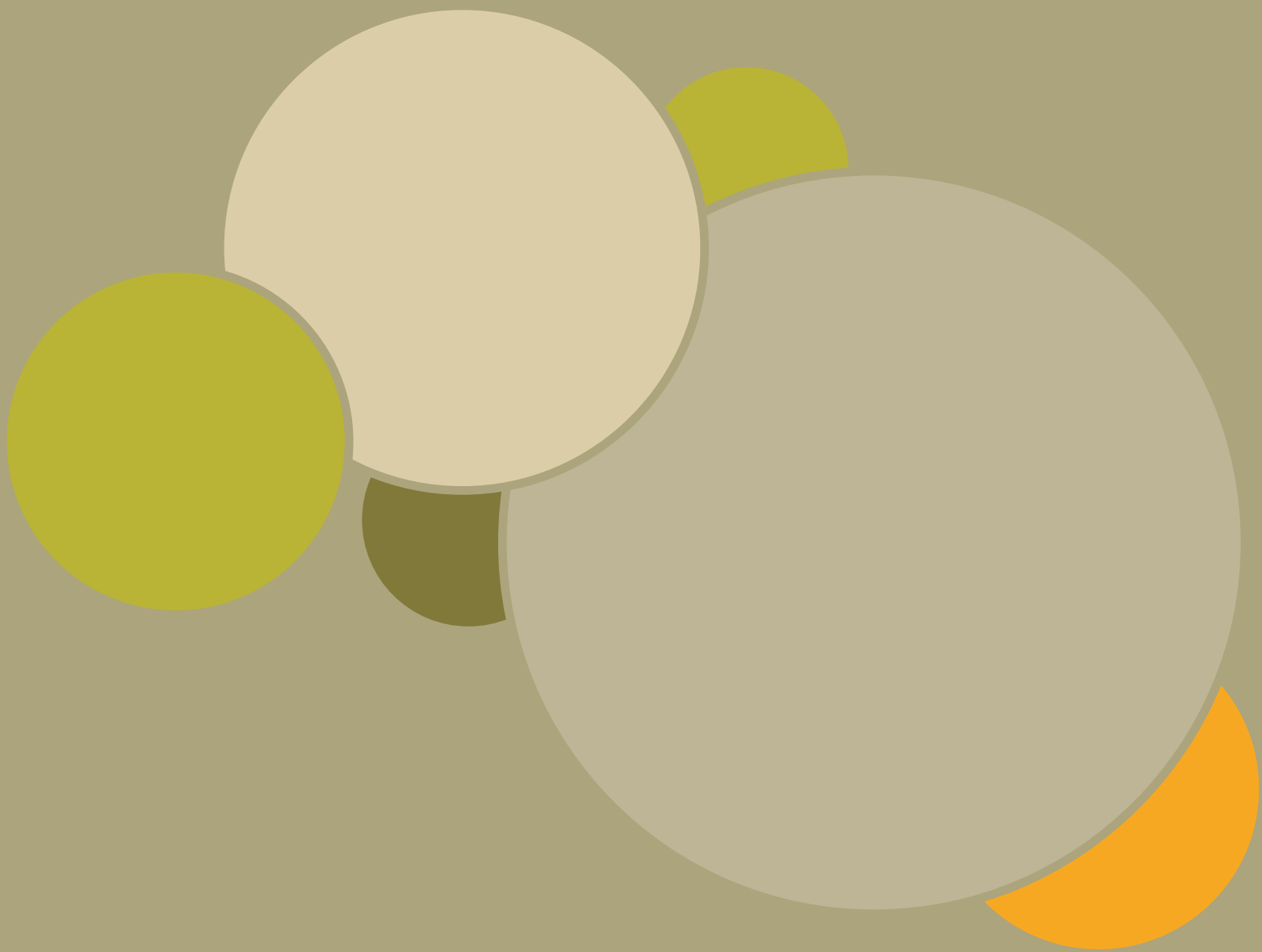
TRAINING IN AGRICULTURAL STATISTICS (Syllabus)

Title of training	Agricultural statistics
Duration	10 days
Training type	Face-to-face
Training level	Degree or Master's in statistics - agronomists and economists with previous training in statistics
Requirements	Statistics, sampling, general economics



Contents

CHAPTER 1 - JUSTIFICATION OF THE COURSE	1
CHAPTER 2 - TRAINING OBJECTIVES AND EXPECTED RESULTS	3
CHAPTER 3 - COURSE DESCRIPTION AND STRUCTURE	5
CHAPTER 4 - TEACHING METHOD	7
CHAPTER 5 - COURSE CONTENT	9
5.1. Module 1. An overview of the general framework of agricultural statistics	9
5.2. Module 2. Data sources, statistical units and collection methods	10
5.3. Module 3. Data processing, analysis and dissemination	11
5.4. Module 4. Analytical frameworks and derived statistics	11
CHAPTER 6 - EVALUATION	13
CHAPTER 7 - ANNEXES	15
7.1. Proposed daily training schedule	15
7.2. Timetable	16
BIBLIOGRAPHIE	18



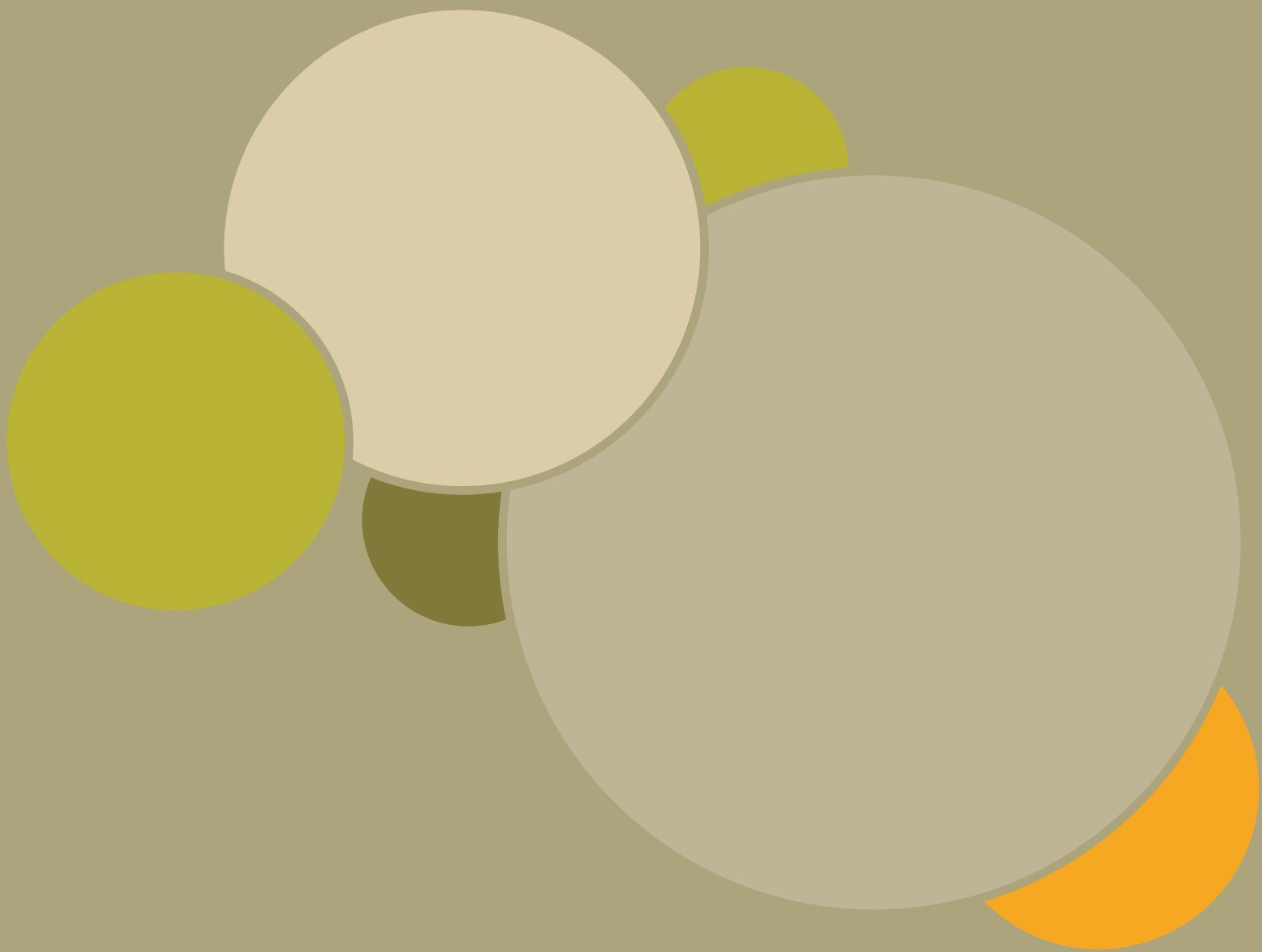
Justification of the course

Agriculture in most countries is the key to economic growth, increased incomes, improved standards of living, efforts to tackle poverty and improvement in food security in conjunction with the environment. Its real impact on the environment highlights the interactions between its roles in the economy and the environment. It has an important role in the domestic economy of these countries in terms of contribution to the growth of domestic wealth (GDP) and in terms of populations employed in the agricultural sector. The behaviour of the national economy is closely linked to the behaviour of the agricultural sector through the supply and demand of agricultural households and investment. The definition, monitoring and measuring of the impact of agricultural economic policies as a whole in relation to other sectors require reliable, up-to-date statistical data on the various aspects of the agricultural sector. To have such statistical data available, the technical and operational capacities of structures involved in statistical activities related to the agricultural sector must be strengthened.

The ability of national agricultural statistics systems (NASS) to produce and disseminate high-quality statistics is therefore largely based on the availability of qualified human resources for preparing, managing and analysing statistics relating to the agricultural sector. The viability of the national agricultural statistics systems (NASS) is guaranteed by statistical capacity building. It is therefore essential that courses are provided to improve skills and fill staff shortages in national agricultural statistics agencies (NASA).

It is to achieve this aim, which forms part of the global strategy framework, that the FAO is preparing this course, comprising the following documents:

- This course syllabus;
- A training guide for a proposed 10-day course;
- A training manual on agricultural statistics;
- A set of Powerpoint presentations, summarizing the content of the training manual;
- An exercise book with solutions.



2

Training objectives and expected results

The objective of the course is to develop data producers' skills in agricultural statistics, in particular statisticians with an advanced training in statistics but with no specialization in agricultural statistics, and professionals specialized in agriculture-related areas (e.g. economists or agronomists) with some training in statistics.

Accompanied by a training guide, the course can also be used to train university students currently enrolled in statistics programs and trainers in agricultural statistics.

The following will be described:

- The agricultural statistics framework;
- Data sources;
- Statistics to be produced;
- Statistical units;
- Collection methods in relation to new technologies;
- Processing, analysis and dissemination;
- Statistics obtained.

The course will focus on the optimal use of the available sources and tools to produce the minimum set of core data.

At the end of the course, trained officers will gain knowledge and skills in agricultural statistics and will be able to do the following:

- understand the scope of agricultural statistics, concepts and classifications;
- identify the main agricultural statistics to be produced for decision-making;
- define statistical units in relation to the topics studied;
- list the sources of agricultural data, and identify the data collected from agricultural censuses and main sample surveys;
- describe the methods used to collect agricultural data, in particular, the ones related to new technologies (GPS, Smartphones, tablets, etc.);
- understand the problems that arise during the processing, analysis and dissemination of agricultural data and ways to overcome them;
- describe the main analytical frameworks and the derived statistics using agricultural data.

3

Course description and structure

This course in agricultural statistics is primarily for National Statistical Offices (NSO) or agricultural statistics services officers, statisticians but not specialized in agricultural statistics.

After a review of some statistical considerations, the manual itself consists of four modules:

- a. Module 1: An overview of the general framework of agricultural statistics;
- b. Module 2: Data sources, statistical units and data collection methods;
- c. Module 3: Data processing, analysis and dissemination;
- d. Module 4: Analytical frameworks and derived statistics.

The targeted audience is moreover supposed to meet certain requirements for the purposes of training. A review of these requirements is given in module 0 of the manual. Although this module is presented in the timetable, it has not been included in the training schedule. It is, however, up to the institution or trainers in charge of delivering the programme to decide on the relevance of module 0. This could be justified by the need to standardize the trainees' knowledge of basic principles. It is, however, recommended that this presentation does not last longer than the first day of the 10-day training session.

The course is therefore divided into modules. Each of these modules will be subdivided into submodules or topics which will form the subject of the training sessions given by the trainer.

These sessions will be illustrated and supported by examples and exercises to enhance understanding.

The modules and learning objectives to be achieved for each module are shown in the table below:

Modules	Main learning objectives
<p>Module 1: An overview of the general framework of agricultural statistics</p>	<ul style="list-style-type: none"> • To determine the scope of agriculture, concepts and classifications; • To have an overview of the conceptual framework of the global strategy to improve agricultural and rural statistics; • To identify links between the economic, social and environmental aspects of this conceptual framework; • To understand the importance of Strategic plans for agricultural and rural statistics (SPARS) and their integration into National strategies for the development of statistics (NSDS); • To list the main users and main uses of agricultural statistics.
<p>Module 2: Data sources, statistical units and data collection methods</p>	<ul style="list-style-type: none"> • To identify agricultural statistics needs; • To describe the organization of the statistical system to better understand how to organize agricultural data production; • To explore the main sources of agricultural statistics; • To describe statistical units (where is the information); • To describe data sources and statistical methods for obtaining information (how to obtain information and what are the collection methods?).
<p>Module 3: Data processing, analysis and dissemination</p>	<ul style="list-style-type: none"> • To understand the problems which arise during processing, analysis and dissemination of agricultural data; • To become familiar with the concepts of areas and yields, placing special emphasis on the necessary data and calculation methods; • To become familiar with production estimation methods; • To understand the methods used for crop forecasting; • To become familiar with agricultural data processing steps and with analysis and dissemination methods.
<p>Module 4: Analytical frameworks and derived statistics</p>	<ul style="list-style-type: none"> • To describe economic accounts for agriculture and economic accounts for the environment (subnational and national level); • To give the importance and various components of costs of production; • To understand the occurrence of post-harvest losses and their economic and social consequences; • To know the different types of agricultural prices and the methods of calculating agricultural price indexes (monthly and annual); • To describe the structure of food balance sheets and their importance as a tool for food security analysis.

4

Teaching method

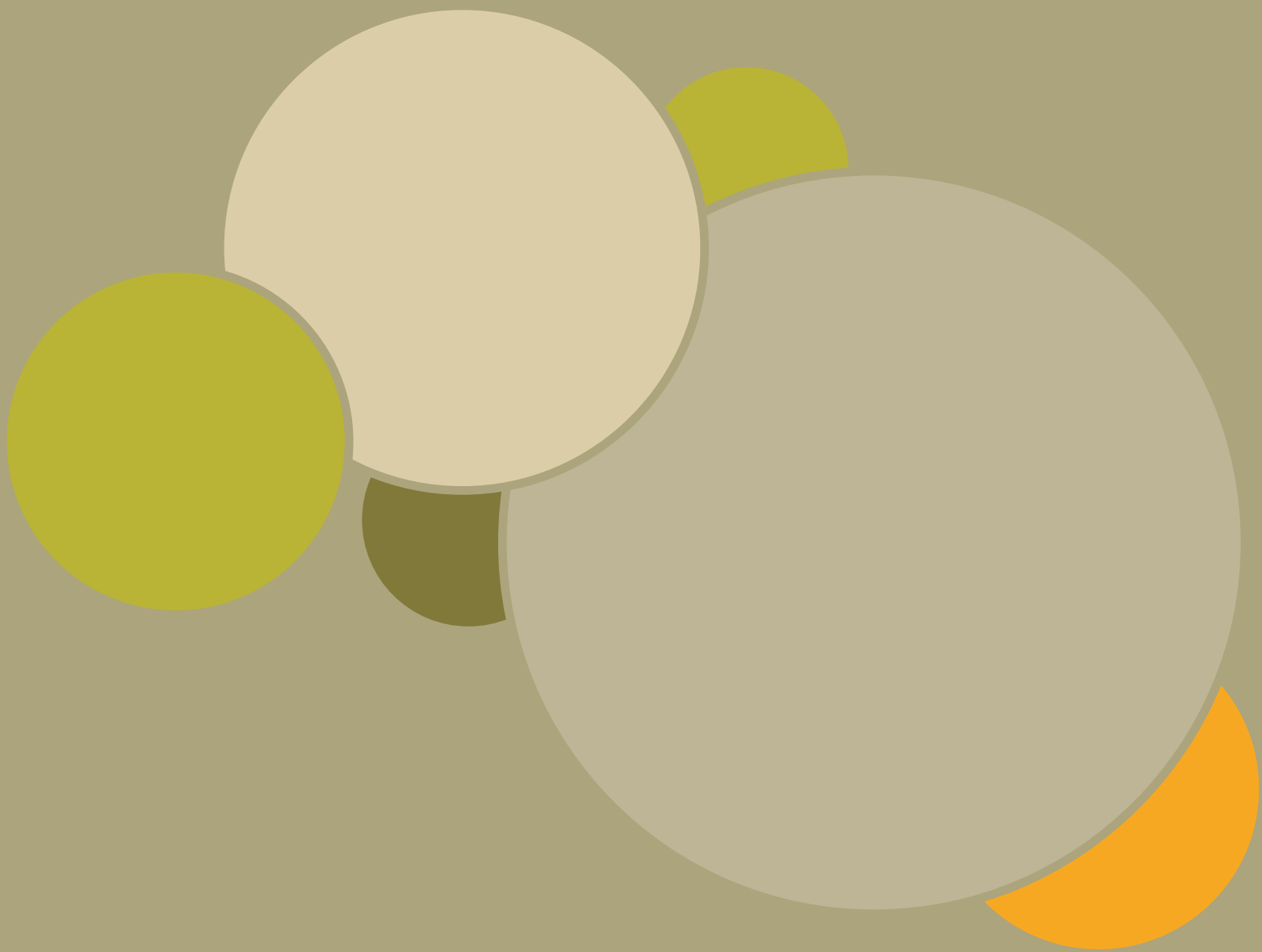
The training will be delivered according to an interactive learning process where a combination of individual and small group participation interacting with the trainer is the key component of the teaching strategy.

It will be based on:

- Visual aids;
- Theoretical presentations by the trainer with training material;
- Exercises to be done by trainees, individually or in small groups.

To meet these requirements, the training material consists of five (5) supporting documents, as follows:

- This course syllabus;
- A training guide for a proposed 10-day course;
- A training manual on agricultural statistics;
- A set of Powerpoint presentations, summarizing the content of the training manual;
- An exercise book with solutions.



5

Course content

The course described will cover four modules and the expected results of the course follow on from the educational goals to be achieved for each module (see table in section 3).

5.1. MODULE 1. AN OVERVIEW OF THE GENERAL FRAMEWORK OF AGRICULTURAL STATISTICS

The topics included in this module are the following:

- Scope of the course;
- Conceptual framework of the global strategy to improve agricultural and rural statistics and its economic, social and environmental dimensions;
- Strategic plans for agricultural and rural statistics (SPARS) and National strategies for the development of statistics (NSDS),
- Users and uses of agricultural statistics.

5.2. MODULE 2. DATA SOURCES, STATISTICAL UNITS AND COLLECTION METHODS

This module is the core of the agricultural statistics course. Its objective is to allow the targeted audience to gain a good understanding of agricultural statistics and basic methodological issues.

The following topics are developed:

- Statistics to be produced: they correspond to the **demand for agricultural statistics** (what people want to know):
They are relative and specific to various data sources:
 - Crop production statistics;
 - Livestock statistics;
 - Aquaculture statistics;
 - Fishery statistics;
 - Silviculture and agroforestry statistics;
 - Environment statistics;
 - Rural statistics;
 - Price statistics.
- **Data producers:** centralized and decentralized statistical systems
- The main **sources of agricultural statistics**:
 - Agricultural censuses;
 - What is an agricultural census?
 - History of the world agriculture programme;
 - Recommendations of the WCA 2010 and WCA 2020;
 - Objectives, scope and content;
 - Institutional organization
 - Thematic sample surveys, in particular concerning:
 - crop production in its broad sense (rainfed or irrigated arable farming, horticulture);
 - livestock production;
 - aquaculture and fisheries;
 - silviculture and agroforestry;
 - the environment;
 - the rural context;
 - prices.
 - Administrative sources;
 - Remote sensing and the geographic information system (GIS) in agriculture;
 - Warning systems / observatories.
- Agricultural **sampling frames**;
- **Statistical units** in relation to specific topics. For each topic studied, the definition of the statistical unit determines the methodology (sampling, collection and processing plan) to be used to obtain the required information.
- **Data collection** and the specific features of the agricultural sector: topics covered include: how to obtain information and the collection methods used. New data collection technologies are also covered. **Collection methods** should be presented with the emphasis on:
 - survey periods and crop calendar;
 - sample-based data production methods
 - questionnaire design
 - conducting interviews
 - the use of new collection technologies (description of GPS and PDAs/tablets/smartphones), the advantages of using GPS and new tools;
 - the typical farm approach.

5.3. MODULE 3. DATA PROCESSING, ANALYSIS AND DISSEMINATION

This module describes all the processing and analysis operations on a data set to obtain the desired information from a source such as a census, sample survey or administrative record.

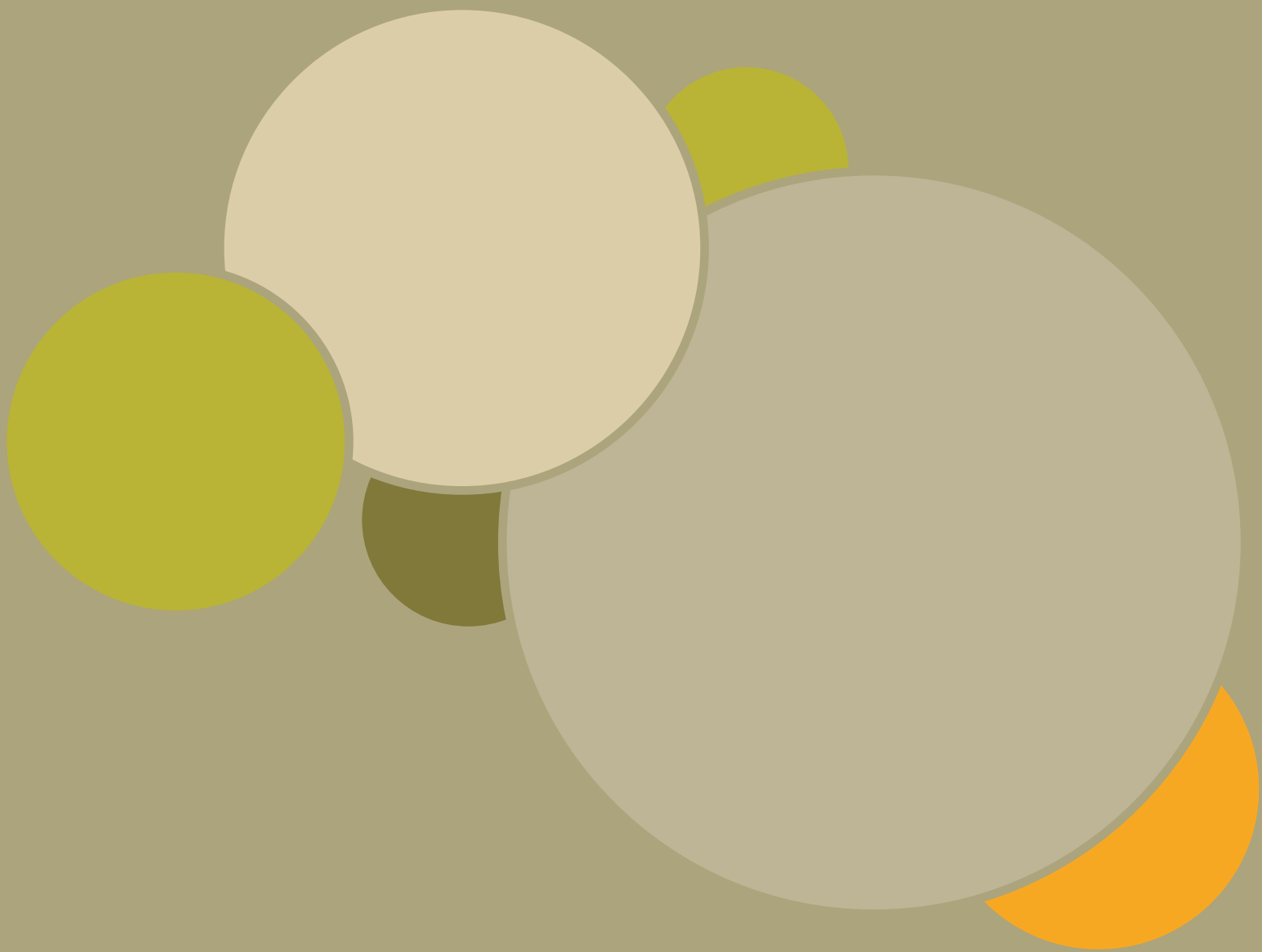
It also covers concepts relating to area and yield, resulting in methods of evaluating production and crop forecasting.

- General overview of current processing practices and limits observed concerning:
 - Shortage of qualified personnel;
 - Inadequacy of statistical methods;
 - Inconsistency in the production of core indicators;
 - Lack of modern equipment;
 - Poor data quality.
- Areas and yields for pure and mixed crops
- Production
- Crop forecasting
 - Forecasting from cultivated areas and mean cob weight or forecast yield;
 - Forecasting by interview.
- Analysis and dissemination
 - Analysis techniques;
 - Metadata;
 - Archiving;
 - Databases and Countrystat;
 - Data security and Data dissemination systems.

5.4. MODULE 4. ANALYTICAL FRAMEWORKS AND DERIVED STATISTICS

The following topics will be covered:

- Economic accounts for agriculture and environmental-economic accounts (subnational and national level);
- Costs of production statistics;
- Post-harvest losses:
 - types of post-harvest losses;
 - methods of estimating post-harvest losses;
 - loss estimation and magnitude;
 - factors influencing post-harvest losses;
 - impacts of post-harvest losses.
- Agricultural producer prices and price indexes (monthly and annual);
- Food security and food balance sheets.

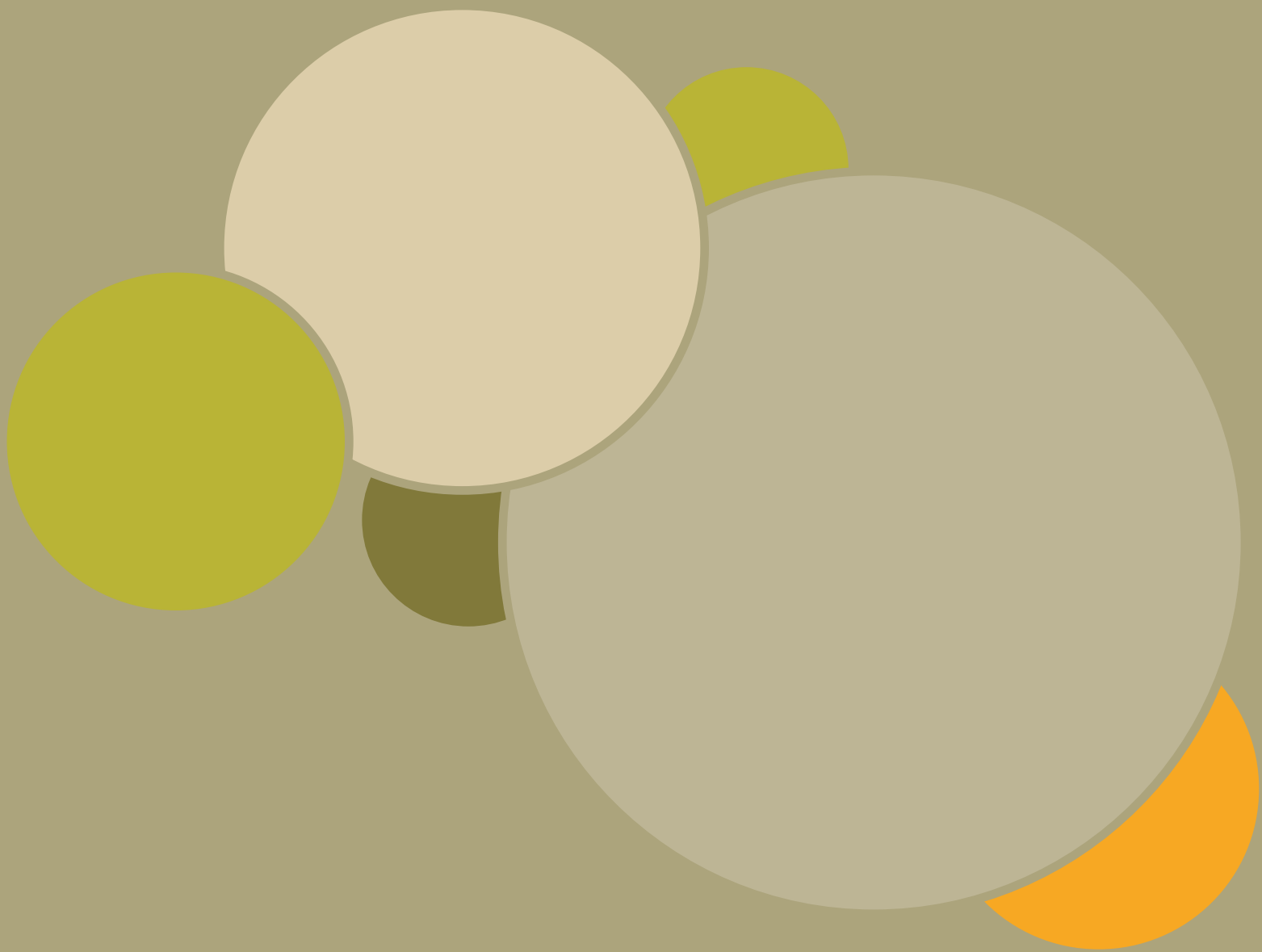


6

Evaluation

The preferred evaluation methods for this course are: on-the-job exercises and a final written test.

It is also recommended that the trainees evaluate the course in order to improve the content constantly.



Annexes

7.1. PROPOSED DAILY TRAINING SCHEDULE:

- 8.00-12.30 h (30 min break at 10.00);
- 12.30 -14.00 h (lunch break);
- 14.00-17.30 h (30 min break at 16.00).

7.2. TIMETABLE

Modules	Exercises	Days	Time
Module 0. Statistical review			
0.1. Definitions	N° 1,2	D0	30 min
0.2. The steps of a statistical survey		D0	30 min
0.3. Sampling method		D0	1 h 30 min
0.4. Data collection		D0	1 h
0.5. Data processing		D0	1 h
0.6. Data analysis		D0	30 min
0.7. Data dissemination		D0	15 min
0.8. Data quality management		D0	15 min
TOTAL FOR MODULE 0		Day 0	5 h 30 min

Module 1: An overview of the general framework of agricultural statistics			
Chapters			
1.1. Scope of the course	N° 3	D1	1 h
1.2. Conceptual framework of the global strategy	N° 4, 5, 6, 7, 8	D1	1 h 30min
1.3. SPARS and NSDS		D1	2 h 30 min
1.4. Users and uses of agricultural statistics	N° 9	D1	30 min
TOTAL FOR MODULE 1		1 day	5 h 30 min

Module 2: Data sources, statistical units and collection methods			
Chapters			
2.1. Statistics to be produced		D2	5 h
2.2. Data producers: centralized and decentralized statistical systems	N° 10	D3	30 min
2.3. Sources of agricultural statistics	N° 11, 12, 13, 14, 15, 16	D3 - D4	9 h
2.4. Statistical units		D4	5 h
2.5. Data collection	N° 17, 18	D4 - D5	7 h
TOTAL FOR MODULE 2		4 days	26 h 30 min

Module 3: Data processing, analysis and dissemination			
Chapters			
3.1. General overview of current processing practices and limits observed		D5	1 h
3.2. Areas and yields for mixed crops	N° 19, 20, 21, 22, 23, 24	D5 - D6	5 h
3.3. Production		D6	1 h
3.4. Crop forecasting		D7	4 h
3.5. Analysis and dissemination		D7	3 h
TOTAL FOR MODULE 3		2 days	14 h

Module 4: Analytical frameworks and derived statistics			
Chapters			
4.1. Economic accounts for agriculture and environmental-economic accounts		D8	5 h
4.2. Cost of Production	N° 25	D8	2 h
4.3. Post-harvest losses	N° 26	D9	2 h
4.4. Agricultural prices and price indexes	N° 27, 28, 29	D9	3 h
4.5. Food security and food balance sheet	N° 30	D9	4 h
TOTAL FOR MODULE 4		2 days	16 h
Summing up-Evaluation			
Summing up		D10	4 h
Evaluation		D10	3 h
TOTAL FOR SUMMING UP-EVALUATION		1 day	7 h
TOTAL THEORETICAL PART			45 h
TOTAL EXERCISES (on average 1 h per exercise)			25 h
TOTAL TRAINING		10 days	70 h

Bibliography

BIBLIOGRAPHIE

Canada. Statistics Canada. 2003. *Survey Methods and Practices*. Statistics Canada Catalogue no. 12-587-XPE. Available at: <http://www.statcan.gc.ca/pub/12-587-x/12-587-x2003001-eng.pdf>. Accessed on September 2017.

Food and Agriculture Organization of the United Nations (FAO). 2017. *World programme for the census of agriculture 2020*. FAO Publication: Rome. Available at: <http://www.fao.org/3/a-i4913f.pdf>. Accessed on September 2017.

2010. *FAO/WFP crop and food supply assessment mission to Lesotho*. FAO special Report: Rome. Available at: <ftp://ftp.fao.org/docrep/fao/010/ah865e/ah865e00.pdf>. Accessed on September 2017.

2005. *World programme for the census of agriculture 2010*. Publication FAO: Rome. Available at: <http://www.fao.org/3/a-a0135e.pdf>. Accessed on September 2017.

1996. *Conducting agricultural censuses and surveys*. Publication FAO: Rome. Available at: http://www.fao.org/fileadmin/templates/ess/documents/publications_studies/publications/SDS_6_Conducting_agricultural_censuses_and_surveys.pdf. Accessed on September 2017.

1995. *World programme for the census of agriculture 2000*. FAO Publication: Rome. Available at : http://www.fao.org/fileadmin/templates/ess/ess_test_folder/Publications/SDS/5_Programme_for_the_world_Census_of_Agriculture_2000.pdf. Accessed on September 2017.

1986. *World Programme for the Census of Agriculture 1990*. FAO Publication: Rome. Available at: <http://www.fao.org/3/a-s8900e.pdf>. Accessed on October 2017

1982. *Estimation of crop areas and yields in agricultural statistics*. FAO Publication: Rome. Available at http://www.fao.org/fileadmin/templates/ess/ess_test_folder/World_Census_Agriculture/Publications/FAO_ESDP/ESDP_22_Engv2.pdf. Accessed on October 2017.

1976. *World programme for the census of agriculture 1980*. Publication FAO: Rome. Available at: <https://unstats.un.org/unsd/progwork/pwabout.asp>. Accessed on October 2017.

1967. *Report on the 1970 world census of agriculture*. FAO Publication: Rome. Available at: <https://www.cabdirect.org/cabdirect/abstract/19786723217>. Accessed on September 2017.

Global Strategy to improve Agricultural and Rural Statistics (GSARS). 2017. *Handbook on the Agricultural Integrated Survey (AGRIS)*. GSARS Guidelines: Rome.

2017a. *Guidelines for the compilation of Food Balance Sheets*. GSARS Guidelines: Rome.

2017b. *Improving Methods for Estimating Livestock Production and Productivity Methodological Report*. GSARS Technical Report Series n. GO-23-2017. Rapport GSARS: Rome. Available at: <http://gsars.org/wp-content/uploads/2017/05/TR-04.05.2017-Improving-Methods-for-Estimating-Livestock-Production-and-Productivity.pdf>. Accessed on September 2017.

2017c. *Methodology for Estimation of Crop Area and Crop Yield under Mixed and Continuous Cropping*. GSARS Technical Report Series n. GO-21-2017: Rome. Available at: <http://gsars.org/wp-content/uploads/2017/03/TR-15.03.2017-Methodology-for-Estimation-of-Crop-Area-and-Crop-Yield-under-Mixed-and-Continuous-Cropping.pdf>

2016a. *Crop1&2: Measuring crop area and yield under pure stand, mixed, and continuous cropping. Findings from the field tests conducted in three countries: Indonesia (Asia/pacific), Rwanda (Africa) and Jamaica (Caribbean region)*. Working paper GSARS n. 16. Rome. Available at: <http://gsars.org/wp-content/uploads/2017/01/WP-16.01.2017-Findings-from-the-Field-Tests-Conducted-in-Three-Countries.pdf>

2016b. *Guidelines for the Enumeration of Nomadic and Semi-Nomadic (Transhumant) Livestock*. GSARS Guidelines: Rome. Available at: <http://gsars.org/wp-content/uploads/2016/08/Guidelines-for-the-Enumeration-of-Nomadic-and-Semi-Nomadic-Livestock-06.pdf>. Accessed on September 2017.

2016c. *Improving Methods for Estimating Livestock Production and Productivity Test Stage: Fieldwork Report and Summary Data Analysis*. Working paper GSARS no. 13: Rome. Available at: http://gsars.org/wp-content/uploads/2016/12/WP_Improving-Methods-for-Estimating-Livestock-Production-Productivity_Test-Stage-081216.pdf. Accessed on September 2017

2016d. *Improving Methods for Estimating Livestock Production and Productivity Gap Analysis Report*. Working paper GSARS n. 12. Rome. Available at: <http://gsars.org/wp-content/uploads/2016/11/Improving-Methods-for-Estimating-Livestock-Production-and-Productivity1.pdf>. Accessed on September 2017.

2016e. *Improving Methods for Estimating Livestock Production and Productivity: Literature Review*. GSARS Technical Report Series n. GO-11-2016. A literature review GSARS: Rome. Available at: http://gsars.org/wp-content/uploads/2016/04/LR_Improving-Methods-for-Estimating-Livestock-Production-and-Productivity-220416.pdf. Accessed on September 2017.

2016f. *Handbook on agricultural Cost of Production Statistics*. GSARS publication: Rome. Available at: <http://gsars.org/wp-content/uploads/2016/07/ACPS-WEBFILE-310516.pdf>. Accessed on September 2017.

2015a. *Gap analysis and proposed methodologies for estimation of crop area and crop yield under mixed and continuous cropping: Research on Improving Methods for Estimating Crop Area, Yield and Production under Mixed, Repeated and Continuous Cropping*. GSARS Working paper n. 4. Rome. Available at: <http://gsars.org/wp-content/uploads/2015/12/WP-2-on-Improving-Methods-for-Estimation-of-Crop-Area-and-Crop-yield-under-Mixed-and-Continuous-Cropping-141215.pdf>. Accessed on September 2017.

2015b. *Handbook on master sampling frames for agricultural statistics*. GSARS publication: Rome. Available at: <http://gsars.org/wp-content/uploads/2016/06/Handbook-on-MSF-FR-WEBFILE-280616.pdf>. Accessed on November 2016.

2015c. *Technical Report on Linking Area and List Frames in Agricultural Surveys*. GSARS Technical Report Series n. GO-08-2015. GSARS technical Report: Rome. Available at: <http://gsars.org/wp-content/uploads/2015/10/TR-on-Linking-Area-and-List-Frames-in-Agricultural-Surveys-191015.pdf>. Accessed on September 2017.

2015d. *Spatial Disaggregation and Small-Area Estimation Methods for Agricultural Surveys: Solutions and Perspectives*. GSARS Technical Report Series n. GO-07-2015. Rome. Available at: <http://gsars.org/wp-content/uploads/2015/09/TR-Spatial-Disaggregation-and-Small-Area-Estimation-210915.pdf>. Accessed on September 2017.

2015e. *Technical Report on Improving the Use of GPS, GIS and Remote Sensing in setting up Master Sampling Frames*. GSARS Technical Report Series n. GO-06-2015. GSARS technical Report: Rome. Available at: http://gsars.org/wp-content/uploads/2015/01/Technical-Report-GPS_GIS_RS-for-MSF-finalv2.pdf. Accessed on September 2017.

2014. *Guidelines for the Integrated Survey Framework*. GSARS Guidelines Publication: Rome. Available at: http://gsars.org/wp-content/uploads/2015/05/ISF-Guidelines_12_05_2015-WEB.pdf. Accessed on September 2017.

2014b. *PSSAR – Strategic Plans for Agricultural and Rural Statistics*. GSARS publication: Rome. Available at: <http://www.gsars.org/wp-content/uploads/2014/07/SPARS-final-3007.pdf>. Accessed on September 2017.

United Nations Economic and Social Council (ECOSOC). 2013. *Generic Statistical Business Process Model V5*. ECOSOC Technical Report Series n. ECE/CES/2014/1. Publication ECOSOC: Paris. Available at: <https://statswiki.unece.org/display/GSBPM/GSBPM+v5.0>. Accessed on September 2017.

International Monetary Funds (IMF). 2007. *Republic of Mozambique: Poverty Reduction Strategy Paper*. IMF Country Report No. 07/37. IMF Publication: Washington, D.C. Available at: www.imf.org/external/pubs/ft/scr/2007/cr0737.pdf. Accessed on September 2017.

United Nations – Department of Economic and Social Affairs (ONU-DESA). 2016. *A Framework for the Development of Environment Statistics*. UN Publication: New York, United-States. Available at: <https://unstats.un.org/unsd/environment/FDES/FDES-2015-supporting-tools/FDES.pdf>. Accessed on September 2017.

2012. *International Recommendations for Water Statistics*. ONU-DESA Statistical Papers Series M No. 91. New York. Available at: <https://unstats.un.org/unsd/envaccounting/irws/irwswebversion.pdf>. Accessed on September 2017.

World Bank, FAO & UN. 2010. *Global Strategy to Improve Agricultural and Rural Statistics*. Report No. 56719-GLB. Publication de la Banque Mondiale : Washington, D.C. Available at : http://www.fao.org/fileadmin/templates/ess/documents/meetings_and_workshops/ICAS5/Ag_Statistics_Strategy_Final.pdf. Accessed on September 2017.

United Nations Educational, Scientific and Cultural Organization (UNESCO). 2006. *International Standard Classification of Education (ISCED, 1997)*, republishing May 2006. Available at: <http://unesdoc.unesco.org/images/0014/001470/147001f.pdf>. UNESCO publication: Genève, Suisse. Accessed on September 2017.

